15 December 2017

SUPPLEMENTARY REPORT ON ENVIRONMENTAL INVESTIGATION

K19 Trutch Former Townsite, Alaska Highway, Northern BC

Submitted to:
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Report Number: 1657709-045-R-RevA

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REPORT

Golder Associates

Executive Summary

Golder Associates Ltd. (Golder) was retained by Public Works and Government Services Canada (PWGSC) to conduct a supplemental environmental investigation for K-19, Former Trutch Townsite (the Site) located at KM 320 of the old alignment of the Alaska Highway at latitude 57º43.908 north and longitude 122º56.564 west. The Site is located approximately 247 kilometres (km) north of Fort St. John.

This report was prepared in accordance with terms and conditions of the PSPC Characterization Consultants Contract with Task Authorizations (CTA) #EZ897-170760/004/PWY) dated 7 December 2016 and scope of work outlined in Golder's document titled "*Request for Amendment #1: Environmental investigation at Site K-19, Alaska Highway, Northern, BC*", dated 30 June 2017. Approval for the scope of work was provided under TA 700383386, dated 25 May 2017 and amended 5 July 2017.

The field investigation was completed between 12 and 30 July 2017. The primary objectives of the July 2017 field investigation were to support remediation planning for Fiscal Year 2017-2018 and following years. In this regard, the specific objectives were to:

1) Further delineate the extents of the known areas of environmental concern (AECs).

2) Investigate more recently identified areas of potential environmental concern (APECs) to determine if additional areas of the Site will require remediation.

3) Support remediation planning for Fiscal Year 2017-2018.

The investigation comprised excavation of 50 test pits, advancing 21 boreholes completed as monitoring wells, groundwater sampling at 50 monitoring wells, collection of soil at seven hand dug and ten hand augered locations, the collection of eight sediment samples in Wetlands C and D, and the collection of ten surface water samples in Wetlands C and D and the unnamed watercourse that occurs on the north side of the Site. In addition, analytical chemistry tables and figures for all previously-acquired data were updated to reflect the new Contaminated Sites Regulation (CSR) Stage 10 amendments (Omnibus) a Stage 11 (Housekeeping) amendments

The overall objectives of the July 2017 investigation program were substantially met. However, soil and groundwater hydrocarbon contamination at AEC 1b has not been delineated on the west side of the former Alaska Highway alignment. Therefore, further investigation is warranted prior to implementation of a remediation program for off-Site areas of contamination.

Based on the results of site investigation works conducted to July 2017, nine areas have been identified to have petroleum hydrocarbon related contamination in soils and are carried forward for remedial excavation work. The table below provides a summary of the aerial extent, approximate depth, and approximate volume of petroleum hydrocarbon contamination in these areas that would be targeted for remedial excavation.

It should be noted that remedial excavation works have been conducted at the Site in 2017, concurrently with the preparation of this report. Remediation work conducted in Fiscal Year 2017/2018 included excavation of contaminated soil in AEC 1b and AEC 1c. The results of this work will be documented under separate cover.

Summary of AECs Retained for Remedial Excavation

APEC / AEC	Description	Estimated Aerial Extent (m^2)	Approximate Depth Range of Contamination (m bgs)	Approximate Volume proposed for Remedial Excavation (m^3)[1]	Status
AEC 1a	Suspected Maintenance Garage	100	0 – 3	300	Area for remediation is delineated.
AEC 1b	*Suspected Maintenance Garage*	*4,200*	*0 – 8.6*	*19,500*[(2)]	*Area for remediation is partially delineated. Petroleum hydrocarbon contamination in soil and groundwater extends to the former alignment. Offsite delineation has not been completed.* *Remediation of on-Site soil contamination was implemented during September/October 2017*
AEC 1c	*Suspected Maintenance Garage*	*1,900*	*0 – 4*	*6,600*	*Area for remediation is delineated. Remediation excavation implemented in October and November 2017.*
AEC 1e	Suspected Maintenance Garage	100	0 – 1	100	Area for remediation is generally delineated.
AEC 2a	Suspected Maintenance Garage	530	0 – 5	1,900	Area for remediation is delineated.
AEC 2b	Suspected Maintenance Garage	1,830	0 – 4	7,700	Area for remediation is delineated.
AEC 19a	Inferred industrial buildings on 1951 Gator map (i.e., large buildings with vehicle access)	210	0 – 3	500	Area for remediation is generally delineated.
AEC 23a	Inferred industrial buildings on 1951 Gator map (i.e., large buildings with vehicle access)	1,220	0 – 4	2,800	Area for remediation is generally delineated.

APEC / AEC	Description	Estimated Aerial Extent (m^2)	Approximate Depth Range of Contamination (m bgs)	Approximate Volume proposed for Remedial Excavation (m^3)[1]	Status
AEC 23b	Inferred industrial buildings on 1951 Gator map (i.e., large buildings with vehicle access)	70	0 – 1	100	Area for remediation is generally delineated. Additional test pitting should be considered to further refine the estimated extent for remediation.
Total Approximate Volume for Remedial Excavation in confirmed AECs				**39,500**	Estimated volumes are preliminary and are based on the level of delineation detailed above. Additional investigation should be considered to further refine the estimated extents for remediation.

Notes:

1) Volumes shown are approximate and are based on the estimated extents of petroleum hydrocarbon contamination shown on Figure 17. Volumes are preliminary and are provided for planning purposes only. Volumes take into account areas where clean overburden materials are present above contaminated soils and assume that clean overburden materials can be reused as backfill.
2) Volume estimate for AEC 1b assumes a maximum excavation depth of 6 m bgs in the area northeast of the former alignment. Volume for remedial excavation assumes that low level exceedances at depth greater than 6 m bgs can be addressed through risk assessment and post remediation monitoring. Volume estimate is based on conceptual understanding of Site conditions at the end of July 2017 and prior to implementation of remediation work implemented in September through November 2017,
3) Italic font denotes AECs where remedial excavation work has been implemented concurrently with the preparation of this report.

In addition to the nine AECs outlined above, which have been retained for remedial excavation, 23 AECs have been retained for risk assessment purposes. Contaminants of concern associated with these AECs consist of toluene in soil (AEC 19b, contamination is too deep to excavate), metals, sodium and chloride in soil and groundwater.

It is anticipated that remaining remedial planning work to be conducted as part of the Fiscal Year 2017/2018 will include off-site delineation to assess the lateral extent of soil and groundwater hydrocarbon contamination to the west of AEC 1b (west of the former highway alignment).

Further to the Revised Remediation Action Plan/Risk Management Plan (Golder 2016d), risk assessment of metals and sodium/chloride contamination in soil and groundwater has been recommended as a component of the remedial design for the Site. The risk assessment is also anticipated to include an assessment of residual hydrocarbon contamination in soil and groundwater, following implementation of remedial excavations through post remediation groundwater and soil vapour monitoring.

The level of investigation to evaluate metals and sodium/chloride contamination is currently considered sufficient to support the preliminary stages of a risk assessment for the Site. Additional assessment of metals and/or salt contaminated soil and groundwater may be required to support completion of a detailed risk assessment.

Notice to Readers

This report was prepared for Canada in accordance with terms and conditions of the Public Services and Procurement Canada (PSPC) in accordance with the terms and conditions of the Site Characterization Consultants Contract with Task Authorizations (CTA) #EZ897-170760/004/PWY) dated 7 December 2016 and scope of work outlined in Golder's document titled "*Request for Amendment #1: Environmental investigation at Site K-19, Alaska Highway, Northern, BC*", dated 30 June 2017. Approval for the scope of work was provided under TA 700383386, dated 25 May 2017 and amended 5 July 2017.

The inferences concerning Site conditions contained in this report are based on information obtained during the assessment conducted by Golder personnel, and are based solely on the condition of the properties at the time of the Site reconnaissance, supplemented by historical and interview information obtained by Golder, as described in this report.

This report was prepared, based in part, on information obtained from historic information sources. In evaluating the subject Site, Golder has relied in good faith on information provided. We accept no responsibility for any deficiency or inaccuracy contained in this report as a result of our reliance on the aforementioned information.

The findings and conclusions documented in this report have been prepared for the specific application to this project, and have been developed in a manner consistent with that level of care normally exercised by environmental professionals currently practicing under similar conditions in the jurisdiction.

With respect to regulatory compliance issues, regulatory statutes are subject to change and interpretation. These statutes and interpretations may change over time, and should be reviewed.

If new information is discovered during future work, the conclusions of this report should be re-evaluated and the report amended, as required, prior to any reliance upon the information presented herein.

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1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by Public Services and Procurement Canada (PSPC) to conduct a supplemental environmental investigation for K-19, Former Trutch Townsite (the Site) located at KM 320 (Franz 2010a) of the old alignment of the Alaska Highway at latitude 57º43.908 north and longitude 122º56.564 west. The Site is located approximately 247 kilometres (km) north of Fort St. John (Figures 1 and 2).

This report was prepared in accordance with terms and conditions of the PSPC Characterization Consultants Contract with Task Authorizations (CTA) #EZ897-170760/004/PWY) dated 7 December 2016 and scope of work outlined in Golder's document titled "*Request for Amendment #1: Environmental investigation at Site K-19, Alaska Highway, Northern, BC*", dated 30 June 2017. Approval for the scope of work was provided under TA 700383386, dated 25 May 2017 and amended 5 July 2017.

The field investigation was completed between 12 and 30 July 2017.

1.1 Site Description and Background

The Site is located within the former Townsite of Trutch, BC, which historically consisted of a highway construction and maintenance camp, refuelling area, dumpsite and residential area. At the time of the most recent investigation (12 to 30 July 2017), part of the Site was overgrown by vegetation and consisted of derelict concrete foundations, stockpiled timber, abandoned motor vehicles, machinery and parts, various refuse piles. Some sections of the Site were clear of vegetation.

Since 2009, a number of environmental investigations have been completed at the Site; prior to the investigation reported herein, the most recent was conducted by Golder in January and February 2017. The results of the investigation work carried out so far have identified several areas of potential environmental concern (APECs) and areas of environmental concern (AECs), and associated potential contaminants of concern (PCOCs) or contaminants of concern (COCs). A list of the current APECs and AECs at the Site, is shown in Table 1, below and on Figure 2. AECs are retained based on the results of intrusive investigation work (*i.e.*, soil and groundwater sampling), while APECs have been retained based on a review of historical information as well as observations made during the June 2016 site walkover (Figure 2)[1]. Additional APECs were identified from a 1951 Site plan provided to Golder by Ron Sedor on September 16, 2016 and summarized in the document entitled "*Updated Sampling and Analysis Plan for K-19 Trutch, Former Alaska Highway Alignment, BC*", dated 22 December 2016.

[1] The extent of APEC 5 has been revised since 2016, based on 2017 field observations as this area became more visible following the tree clearing operations.

Table 1: Investigated APEC and AEC Summary Table for K-19

APEC / AEC	Description	Further Assessed in July 2017 (Yes/No)
AEC 1a	Suspected Maintenance Garage	Yes
AEC 1b	Suspected Maintenance Garage	Yes
AEC 1c	Suspected Maintenance Garage	No
AEC/APEC 1d	Berm of debris (100 m long) near Suspected Maintenance Garage	Yes
AEC 1e	Shallow hydrocarbon contamination on the eastern side of the access road	Yes
AEC 2a	Suspected Maintenance Garage	No
AEC 2b	Suspected Maintenance Garage	No
AEC/APEC 3a (1)	Former residential area with ASTs, minor surface debris	No (2)
AEC/APEC 3b (1)	Former residential area with ASTs, minor surface debris	No (2)
APEC 4	Former residential area with USTs, and minor surface debris	Yes
APEC 5	Potentially Buried Debris	Yes
APEC 6	Surface Area Debris	Yes
APEC 7a	Potentially Buried Debris (including Car Parts)	No
APEC 7b	Surface Area Debris	No
APEC 8	Potentially Buried Debris	No
APEC 9	Surface Area Debris including 200-L Drum	No
APEC 10a	Rebar and 200-L Drum	Yes
APEC 10b	Partially Exposed Metal Pipe	Yes
APEC 11	Surface Area Debris including AST, Abandoned Fuel Pumps, and 200-L Drums	Yes
APEC 12	Surface Area Debris including 200-L Drums, Abandoned Residential Structure, and vehicle parts	Yes
APEC 13	Inferred non-industrial buildings on 1951 Gator map (i.e., small buildings without vehicle access)	Yes
APEC 14	Inferred industrial buildings on 1951 Gator map (i.e., large buildings with vehicle access)	Yes
APEC 15	Inferred industrial building on 1951 Gator map (i.e., large buildings with vehicle access)	Yes
APEC 16	Inferred non-industrial buildings on 1951 Gator map (i.e., small buildings without vehicle access)	Yes
APEC 17	Inferred industrial buildings on 1951 Gator map (i.e., large buildings with vehicle access)	Yes
APEC 18	Inferred non-industrial buildings on 1951 Gator map (i.e., small buildings without vehicle access)	Yes

APEC / AEC	Description	Further Assessed in July 2017 (Yes/No)
APEC 19	Inferred industrial buildings on 1951 Gator map (i.e., large buildings with vehicle access)	Yes
APEC 20	Inferred non-industrial buildings on 1951 Gator map (i.e., small buildings without vehicle access)	Yes
APEC 21	Inferred industrial buildings on 1951 Gator map (i.e., large buildings with vehicle access)	Yes
AEC 23a	Inferred industrial buildings on 1951 Gator map (i.e., large buildings with vehicle access)	Yes
AEC 23b	Inferred industrial buildings on 1951 Gator map (i.e., large buildings with vehicle access)	No
APEC 24	Inferred industrial buildings on 1951 Gator map (i.e., large buildings with vehicle access)	Yes
APEC 25	Inferred non-industrial buildings on 1951 Gator map (i.e., small buildings without vehicle access)	Yes
APEC 26	Inferred industrial buildings on 1951 Gator map (i.e., large buildings with vehicle access)	Yes
APEC 27	Inferred non-industrial buildings on 1951 Gator map (i.e., small buildings without vehicle access)	Yes

Notes:

1) AEC was defined by Franz / Arcadis under the federal Regulatory Regime. Based on existing data these areas are considered APECs rather than AECs.
2) Chemical analytical results for this area were updated to the CSR Standards with Stage 10 amendments.

2.0 OBJECTIVES AND SCOPE OF WORK

2.1 Objectives of Investigation

The initial primary objectives of the July 2017 field investigation were to support remediation planning for Fiscal Year 2017-2018 and following years. In this regard, the specific objectives were to:

1) Further delineate the extents of the known AECs.

2) Investigate more recently identified APECs to determine if additional areas of the Site will require remediation.

3) Support remediation planning for Fiscal Year 2017-2018.

2.2 Scope of Work

In order to meet the objectives of the investigation program, Golder implemented the following scope of work:

- Prior to mobilizing to the field, preliminary soil vapour partition modelling was conducted within existing APECs that were investigated as part of the previous investigations. The preliminary screening tool was used to determine if any of the previously investigated APECs had predicted vapour concentrations that would exceed outdoor air standards and require the installation of soil vapour probes.
- Provided the necessary biological monitoring and mitigation associated with presence of potential species at risk and or environmental sensitive habitat at the Site.
- Construction of trails and clear trees to provide access for the environmental investigation.
- Collection of samples from the sandstone quarry located approximately 5km south of the Site
- Completion of utility locates and the investigation of previously identified geophysical anomalies
- Completion of eight (8) hand auger to characterize soil in areas that can only be accessed by foot due to access constraints or where due to the nature of potential sources of contamination initially shallow (<1m) soil samples were required.
- Completion of seven (7) hand-dug samples in areas with surface debris (APEC 1d, 6) to obtain a preliminary assessment of those APECs.
- Completion of eight (8) sediment samples from Wetlands C and D to obtain data for future risk assessment.
- Completion of 50 test pits across the Site to investigate and/or better-delineate petroleum hydrocarbon, metals and salt-contaminated soil within AECs and APECs.
- Completion of 21 boreholes and/or monitoring wells to:
  - Determine the groundwater quality downgradient, and within select APECs and/or AECs.
  - Assist in determining the groundwater hydraulic gradient(s).
  - Measure hydraulic conductivity.

- Develop 21 newly-installed monitoring wells and one existing monitoring well.
- Sample 50 existing and newly-installed monitoring wells.
- Collection of ten (10) surface water samples from Wetland C and D and the unnamed watercourse on and downgradient of the Site to obtain data for future risk assessment.
- Survey newly-installed monitoring wells and test pit locations across the Site.
- Update the existing analytical chemistry tables and figures, including assessment against the new Contaminated Sites Regulation (CSR) Stage 10 (Omnibus) and Stage 11 (Housekeeping) amendments (refer to Section 3.2).
- Report preparation.

The scope of work was carried out as planned, with the addition of select Site features professionally surveyed in addition to the borehole and test pit locations. These features included the demarcation (staking) and surveying of AECs 1b and 1c in preparation for the planned remediation.

2.3 Constraints of Work

The constraints to the July 2017 field investigation program was primarily associated with higher than average rainfall during the month of July, which contributed to challenges to vehicular access to several locations due to the saturated ground conditions.

3.0 REGULATORY CRITERIA

Golder understands that the Site is owned by the province of British Columbia and leased from the Province by PSPC. The former site use was industrial but also included accommodation as part of the maintenance camp. Currently there are no buildings on site. Based on this ownership structure, both provincial and federal environmental legislation were applied to the Site to assess soil and groundwater quality that was characterized during the investigation. In addition, Provincial regulations are to be applied in the event that the Site is transferred back to the Province. The assessment of data in regard to developing remedial objectives and remedial planning was based on the Provincial standards.

Generally, provincial and municipal laws, regulations and requirements do not apply on federal lands, activities or undertakings. Soil and other materials that are removed from federal lands may become subject to provincial or municipal laws and regulations. Provincial or municipal standards may be used in relation to federal lands only as guidelines for the purpose of establishing remediation goals and objectives. The term "standards" is used in this part in order to maintain consistency in terminology throughout this document, and does not imply that standards contained in provincial or municipal laws and regulations apply on federal lands, activities or undertakings.

3.1 Federal Regulations

For federal lands, the Canadian Council of Ministers of the Environment (CCME) has defined Environmental Quality Guidelines (EQGs) for soil, sediment and surface water to assess potential chemical impacts. These guidelines are presented in a CCME compendium document titled, “Canadian Environmental Quality Guidelines” (CCME 1999, last revision 2014).

In addition, Federal Approved and Interim Groundwater Quality Guidelines (FIGQG, GoC 2015) have been developed to assist federal custodians in assessing, remediation/risk managing federal contaminated sites funder under the Federal Contaminated Sites Action Plan (FCSAP).

3.1.1 Soil

Residential, Parkland, and Agricultural standards were considered applicable to the Site in the event that Residential land use is considered in the future. For federal sites in Canada, and provincial sites in BC, the acceptable incremental lifetime cancer risk (ILCR) is 1 in 100,000. Health Canada (Health Canada, 2010) considers cancer risks from chemical exposure to be essentially negligible if the ILCR is less than 1 in 100,000. As such, an ILCR of 1 in 100,000 was considered applicable to the Site.

Surface soil, as defined by CCME, consists of soil within 1.5 m of the ground surface. Sub-surface soil is considered to be deeper than 1.5 m below ground surface. CCME defines soil quality guidelines for both surface and sub-surface soil as well as for fine and coarse-grained soil. In order to compare against the most conservative standard across the Site, fine and surface soil CCME standards were applied in all analyses, regardless of depth.

3.1.2 Groundwater

Although currently there are no drinking water wells within 1,500 metres of the Site, drinking water (DW) guidelines are considered applicable as the bedrock aquifer could potentially be used for water supply in the future. Freshwater aquatic life (FW) guidelines are also considered applicable to this Site due to its proximity to freshwater surface water bodies. CCME (2008 and 2009) drinking water guidelines are published by Health Canada and are based on current, published scientific research related to health effects, aesthetic effects, and operational considerations.

The FIGQGs (GoC 2015) were used to assess groundwater quality at the Site under federal legislation. As detailed in GoC 2015, the FIGQG have been generally developed using methods consistent with approved CCME protocols.

3.1.3 Surface Water

Freshwater aquatic life (FW) standards were considered applicable to this Site and CCME Water Quality Guidelines for the Protection of Aquatic Life were applied to the Site (CCME 2011). CCME water guidelines were developed to compare against surface water.

3.1.4 Sediment

Sediment samples were compared to CCME's interim sediment quality guidelines (ISQGs) and probable effect levels (PELs) for FW aquatic life. For comparative purposes, the sediments were also compared to the Stage 10 CSR FW sediment standards for both Typical and Sensitive uses.

3.2 Provincial Regulations

In BC, environmental matters pertaining to contaminated sites generally fall under the jurisdiction of the Ministry of Environment and Climate Change Strategy, pursuant to the Environmental Management Act (EMA, SBC 2003, Chapter 53 assented to 23 October 2003, updated to 30 October 2017). The key regulation under the EMA that relates to the assessment and remediation of contaminated sites is the Contaminated Sites Regulation (CSR; BC Reg. 375/96, O.C. 1480/96 and M271/2004, as updated [includes amendments up to BC Reg. 253/2016 and BC Reg. 196/2017, updated to 1 November 2017]). BC Reg. 253/2016 is also known as the Stage 10 or Omnibus amendment; BC Reg. 196/2017 is also known as the Stage 11 or Housekeeping amendment. These two amendments, became effective 1 November 2017, include significant changes to the text and numerical standards of the CSR, and are accompanied by new technical guidance documents and administrative procedures.

A related regulation under the EMA is the Hazardous Waste Regulation (HWR; BC Reg. 63/88, O.C. 268/88, as updated [includes amendments up to BC Reg. 243/2016, updated to 1 November 2017]). Previous amendments to the CSR and the HWR (in effect 19 July 2016) decoupled the CSR and HWR for the management of contaminated sites, such that the role of the HWR in contaminated sites is limited to cases of off-Site transport and disposal of material meeting the criteria of hazardous waste, and cases involving materials that do not meet the definition of on-site media (e.g., drums of hazardous waste, dumped hazardous waste, mine tailings and waste rock).

A third regulation in effect in BC that applies to environmental investigations is the BC Ground Water Protection Regulation (GPWR; BC Reg 39/2016, O.C. 113/2016, including amendments up to BC Reg 152/2016, 10 June 2016). This regulation establishes standards to protect groundwater supplies by requiring wells in BC, including environmental boreholes, test pits and monitoring wells, to be properly constructed, maintained, and, at the end of their service and properly deactivated.

3.2.1 Soil

The CSR identifies soil standards based on six land use categories and two sub-categories: Agricultural (AL); Urban Park (PL); Wildlands (WL) (subdivided into natural and reverted); Residential (RL) (subdivided into low density and high density); Commercial (CL); and Industrial (IL). The CSR also includes standards for the protection of human health (including intake of contaminated soil) and environmental protection in consideration of environmental receptors. The standards are further divided into site-specific standards, based on the nature of the land and groundwater use at or in the area of a subject site, including standards for groundwater used for drinking water (DW), groundwater flow to aquatic life in surface water (AW), groundwater used for livestock watering (LW), and groundwater used for irrigation (IW). The CSR also includes provision for the development of site-specific risk-based standards.

Current land use of the Site is considered to be Wildlands land use. For the purposes of remediation, Wildlands Reverted land use is considered to be applicable for the top three metres of soil, followed by Industrial land use below three metres[2]. Future land use has been considered for Wildlands Reverted for the top three metres of soil, similarly followed by Industrial deeper than three metres below ground surface (m bgs). The following CSR matrix and generic numerical soil standards (Schedule 3.1) were considered applicable to the Site:

- Human health protection—intake of contaminated soil
- Human health protection—protection of groundwater used as drinking water
- Environmental protection—toxicity to soil invertebrates and plants
- Environmental protection—groundwater flow to freshwater used by aquatic life

MoE's Protocol 4 for Contaminated Sites under the CSR provides the regional background soil quality estimates for specified inorganic substances in British Columbia and provides procedures to establish background soil quality on a site-specific basis for use under the Regulation (BC MOE 2017). Where exceedances of the CSR soil standards were identified, the exceedances were compared to Protocol 4 – *Table 1: Regional Estimates for Background Concentrations in Soil for Inorganic Substances, Omineca/ Peace Region.* Background soil concentrations for arsenic, barium, chromium, cobalt, copper, iron, and selenium for the Peace Region of BC in Protocol 4 were greater than the standards set out in the CSR and were used in its place.

[2] Based on Stage 10 Amendment to CSR under Section 17 (3).

3.2.1.1 BC Hazardous Waste Leachable Quality Standards

Toxicity characteristic leaching procedure (TCLP) results were compared to BC Hazardous Waste Leachable Quality Standards (Schedule 4 in HWR).

3.2.2 Groundwater

The CSR identifies groundwater standards for the protection of drinking water (DW), irrigation (IW), livestock watering (LW), fresh water (FW) and marine water (MW) surface water bodies (AW). The CSR groundwater standards (Schedule 3.2) for the protection of aquatic life (AW) in freshwater (FW) bodies and for protection of groundwater used as drinking water (DW) were considered applicable to the Site. Provincial drinking water standards for dissolved iron and manganese were not considered applicable to the Site as the industrial and commercial activities executed on Site did not fall under applicable purposes or activities outlined in Schedule 2 of the CSR.

3.2.3 Surface Water

Guidance on the applicable water standards (groundwater and/or surface water) are provided in the following two BC MoE documents:

- Technical Guidance #15 (TG15) on Contaminated Sites *Concentration Limits for the Protection of Aquatic Receiving Environments* (November 2017); and,
- Protocol #21 (P21) *Water Use Determination* (V 2.0, Approved 31 October 2017; Effective 1 November 2017).

Based on TG15, the British Columbia (Approved and Working) Water Quality Guidelines (“BCWQG”; BC MoE 2006, most recently updated in June 2017) were developed for the protection of aquatic life in receiving environments, while the BC CSR *Schedule 6 Generic Numerical Water Standards* was developed for the protection of groundwater and surface water that may discharge into an aquatic receiving body.

The BCWQG have been developed as chronic and/or maximum guidelines to protect six water uses: drinking water, aquatic life (freshwater and marine), wildlife, recreation and aesthetics, agriculture (irrigation and livestock watering) and industrial (e.g., food processing industry). Approved guidelines (BC MoE 2017) exist for most metals, BTEX and PAHs while working guidelines (BCWQG, 2017) are presented for those parameters that have not yet been approved by the MoE. The working guidelines were compiled from various Canadian and North American jurisdictions. These working guidelines provide benchmarks for those substances which have not yet been fully assessed and formally endorsed by the BC MoE. The approved and working BCWQG apply to total metals, with the exception of dissolved aluminum and dissolved iron. Dissolved metal concentrations were also measured, and the results screened against the BCWQG for reference purposes. The BCWQG are generally applied to total concentrations in unfiltered surface waters. The BCWQG provide maximum and long-term average values. Long-term average WQGs are generally intended to be applied to mean concentrations of five samples collected over a 30-day period.

The surface water analytical results were screened against the freshwater guidelines protective of aquatic life.

3.2.4 Sediment

Sediment samples were compared to the standards outlined in CSR Schedule 3.4 – Generic Numerical Sediment Standards for protection of freshwater sediment. Sediment standards for both sensitive use (Schedule 3.4 – Column III) and typical use (Schedule 3.4 – IV) were considered applicable to the Site.

3.2.5 Soil Vapour

The CSR provides Generic Numerical Vapour Standards (Schedule 3.3, under the Stage 10 Amendments) for use in the assessment of soil vapour quality at sites subject to investigation. The vapour standards are divided into three categories based on land use and include standards for residential (RL), agricultural (AL) and urban park (PL) (as one category), commercial (CL) and industrial (IL) land uses.

The BC MoE document titled *"Technical Guidance 4 – Vapour Investigation and Remediation"* allows for the application of vapour attenuation factors (indoor or outdoor air concentration divided by the soil vapour concentration) to predict indoor and outdoor vapour concentrations from soil vapour concentrations, as follows:

$$C_{air} = C_{vapour} * \alpha$$

Where α is the vapour attenuation factor, C_{air} is the estimated air concentration of the substance, and C_{vapour} is the measured or predicted soil vapour concentration of the substance. For indoor air, the vapour attenuation factor takes into account the attenuation of soil vapours that occur through migration in the vadose zone and the building foundation, and mixing of vapours in indoor air. Vapour attenuation factors for indoor air are based on the land use of the site, soil vapour sample location, and the distance between the soil vapour sample and receptor (building or outdoor air). The soil vapour concentration may be measured or estimated from measured soil and/or groundwater concentrations, subject to the criteria listed in BC MoE TG4.

The CSR PL vapour standards (Schedule 3.3) are considered applicable to the Site. The rationale adopted for the current program was based on using a step by step approach, which initially used the existing soil and/or groundwater detectable concentrations of volatiles and adopting partitioning to estimate soil vapour concentrations. Given the current and anticipated future open use of the Site, the outdoor scenario was considered as the most appropriate end use regarding partitioning factors and soil vapour standards. In cases where nearby properties within 30 m of areas with detectable volatile concentrations were identified, the indoor standards were also adopted.

4.0 FIELD METHODS

This section of the report outlines the methods used in order to complete the scope of work described in Section 2.2, above, including the overall approach and rationale of the investigation.

A photographic summary of the field program is presented in Appendix A.

4.1 Approach and Rationale

The overall approach of the soil characterization program is outlined in Golder's document entitled "*Sampling and Analysis Plan for K-19 Trutch, Former Alaska Highway Alignment, BC*" (Golder 2017). The SAP was developed by considering the data gaps that had been originally identified at the Site and subsequent data gaps identified through the course of supplementary investigations, and the implications the data gaps may have on overall remediation plan for the Site.

The July 2017 soil characterization program focused on AECs 1a, 1b, 1d, and APECs 4 to 6, 10a to 23a and 24 to 27. A summary of sampling locations completed within each APEC/AEC and the rationale is shown in Table 2. Sampling locations are shown on Figures 2 through 15, at the end of this report.

Table 2: Summary of Borehole, Monitoring Well, Sediment, Hand Auger and Test Pit Locations

APEC/AEC	Borehole, Monitoring Well and Test Pit Locations	
	Proposed Locations	**Rationale**
AEC 1a	K19-TP17-73 K19-HA17-01 to -05 K19-SS17-01 to -08 K19-SW17-01 to 10	- TP to test geophysical anomaly. - HAs to delineate sodium and chloride contamination near the former salt pile. - SW and sediment samples to determine if an aquatic pathway is present.
AEC 1b	K19-MW17-29S/D, K19-MW17-35S/D K19-TP17-69, -70, -79	- BHs completed as MWs west of the proposed remediation footprint (on the western side of the former alignment) to characterize soil and groundwater off-site). - TPs to provide lateral delineation southwest of the known PHC and VOCs contamination for remediation excavation delineation purposes. - TP to confirm the toluene results in TP17-48.
AEC 1d	K19-MW17-32 K19-HD17-01 to -04	- BH/ MW and located in the inferred downgradient direction of the debris berm to test GW. - Hand dug samples collected within the debris berm (for characterization purposes).
AEC 1 e	K19-TP17-52, -53, -62	- Three shallow TP locations approximately 10 m from the known contamination (K19A-10TP-05) to provide lateral delineation to the northeast, east and south (for remediation excavation delineation purposes).
APEC 4	K19-MW17-28 K19-TP17-55 to -57	- BH/ MW in the inferred downgradient direction of suspect UST(s) location(s) for initial characterization of the APEC. - TPs to assist with lateral delineation around the suspect UST(s).
APEC 5	K19-MW17-18	- BH/ MW located inferred downgradient of the debris mound to assess potential impact to the soils and groundwater beneath the mound

APEC/AEC	Borehole, Monitoring Well and Test Pit Locations	
	Proposed Locations	**Rationale**
APEC 6	K19-MW17-20 K19-HD17-05 to -07	- BH/ MW located inferred downgradient of the debris to assess potential impact to the soil and groundwater beneath the debris. - Shallow hand dug samples to characterize the soils within the debris pile for characterization purposes
APEC 9	K19-HA17-09 and -10	- HAs located proximal to the drum to for initial characterization of the APEC.
APEC 10a	K19-HA17-08	- HA located proximal to the drum to for initial characterization of the APEC.
APEC 10b	K19-HA17-06	- HA located proximal to the drum to for initial characterization of the APEC.
APEC 11	K19-MW17-31 K19-TP17-77 and -78	- BH/ MW located inferred downgradient of the AST dumping area or area most likely to be contaminated, for initial characterization of the APEC. - TPs to provide lateral characterization around the dumped AST/ fuel pump for initial characterization of the APEC.
APEC 12	K19-MW17-30 K19-TP17-74 to -76	- BH/ MW located inferred downgradient of the debris/ or area most likely to be contaminated, for initial characterization of the APEC. - TPs to assist with lateral characterization of potential contamination of the APEC.
APEC 13	K19-TP17-58 to 61, -80, -81, -86	- TPs to provide initial characterization around the former buildings.
APEC 14	K19-MW17-33	- BH/ MW in the inferred downgradient direction of the building and/ or area most likely to be contaminated, for initial characterization of the APEC.
APEC 15	K19-MW17-34	- BH/ MW in the inferred downgradient direction of the building for initial characterization of the APEC.
APEC 16	K19-MW17-25 K19-TP17-67	- BH/ MW located inferred downgradient of the building and/ or area most likely to be contaminated, for initial characterization of the APEC. - TP to provide initial characterization of the footprint and near the former building.
APEC 17	K19-MW17-24 K19-TP17-64 and -66	- BH/ MW located inferred downgradient of the buildings for initial characterization of the APEC. - TPs to provide initial characterization in the footprint and near the former buildings.
APEC 18	K19-MW17-23	- BH/ MW in the inferred downgradient direction of the building or area with the highest concentrations of the PCOCs.
APEC 19	K19-MW17-26	- BH/ MW in the inferred downgradient direction of the APEC or area with the highest concentrations of the PCOCs.
APEC 20	K19-MW17-27	- BH/ MW in the inferred downgradient direction of the APEC or area with the highest concentrations of the PCOCs.
APEC 21	K19-MW17-21	- BH/ MW in the inferred downgradient direction of the APEC or area with the highest concentrations of the PCOCs.
AEC 23a	K19-TP17-54, -63, -68, 71, -83, -84	- TPs for delineation purposes.
APEC 24	K19-MW17-18	- BH/ MW located inferred downgradient of the former buildings to assess potential impact to the soils and groundwater (shared with APEC 5).

APEC/AEC	Borehole, Monitoring Well and Test Pit Locations	
	Proposed Locations	Rationale
APEC 25	K19-MW17-22	- BH/ MW in the inferred downgradient direction of the buildings or area with the highest concentrations of the PCOCs.
APEC 26	K19-MW17-17	- BH/ MW in the inferred downgradient direction of the buildings or area with the highest concentrations of the PCOCs.
APEC 27	K19-MW17-19 K19-TP17-87	- BH/ MW located inferred downgradient of the building and/ or area most likely to be contaminated, for initial characterization of the APEC. - TP to provide initial characterization of the footprint and near the former building
Background	K19-HA17-01	- HA away from known sources of contamination or previous activity to support risk assessment and/or background determination.

Notes:
BH= borehole, HA = hand auger, MW = monitoring well, SW = surface water, TP = test pit

Because the soil investigation program was conducted in order to support remediation planning activities for the Site, soil samples were generally submitted for CSR-regulated parameters which were used for developing remedial objectives for the Site (e.g., LEPH/HEPH, BTEX/VPH) as opposed to hydrocarbon-based parameters listed in Federal guidance documents (e.g., CWS PHC F1-F4).

4.2 Health and Safety

Prior to undertaking the field investigation program, the existing health and safety plan for the Site was updated to reflect current site conditions. The plan addressed potential health and safety issues that had been identified on the Site, and provided mitigation measures to address those potential risks. The plan also included a detailed check-in and check-out procedure, due to the remote location of the Site.

4.3 Site Clearances

A BC One Call was completed prior to advancing the test pits or drilling. No utility services were reported in the BC One Call database and the Site has no existing services. Underworld Line Locating Ltd. (Underworld) was also contracted to complete utility locates in along the former alignment in the area around proposed borehole locations in the vicinity of AEC1b. Underworld also investigated for the presence of utilities and anomalies in the areas where geophysical anomalies were previously identified during the March 2016 investigation.

Tree clearing and mulching was subcontracted to M&M Resources Inc. (M&M) of Fort Nelson. The mulching took place with input from Ron Sedor from North Forest Resources Management Ltd. Mr. Sedor completed a Site visit to demark areas permitted for clearance under the Site's Free Use Permit (#20763 and #20764) issued 29 June 2017.

4.4 Environmental Monitoring

In advance of the field program, Golder's qualified environmental professional (QEP) provided a brief effects assessment technical memorandum entitled "*Assessment of Potential Effects – K-19 Trutch Environmental Investigation"* dated 7 July 2017. This technical memorandum was developed referencing a previous habitat assessment completed by Golder entitled "Habitat Assessment at K-19 Trutch Former Townsite, Alaska Highway, Northern, BC" dated 11 August 2016 (Golder 2016c) and the January and February Field Investigation (Golder 2017c) The technical memorandum included recommended mitigation measures to avoid or reduce potential for adverse effects. The document included an appended Environmental Protection Plan (EPP) that outlined best practices, such as avoidance of or setback buffers to sensitive habitats, erosion and sediment control, a spill response and emergency response to be implemented during tree felling and the geo-environmental investigation program (Golder 2017b).

A Golder biology team conducted a 6-day environmental monitoring field visit from 12 to 17 July 2017, during the tree mulching and the geo-environmental investigation program. The purpose of the field visit was to provide an environmental orientation for the Contractors to outline sensitive habitats and observe the Contractor's work as it related to construction best practices and expected mitigation measures. For the remainder of the field investigation, a brief daily environmental report was completed by the Golder Site Supervisor and provided to Golder's Qualified Environmental Professional (QEP) at the close of the field program. A summary of the environmental observations contained within the daily reports is presented in Appendix B.

4.5 Test Pitting Investigation

The test pit investigation comprised excavating 50 test pits between 14 and 22 July 2017. A John Deere 240D LC excavator, supplied and operated by Eh Cho Dene (ECD) was used to excavate the test pits.

Test pits were advanced to a minimum pre-determined depth, based on the data gap that each location was intended to address. In general, test pits were excavated to a depth of at least 2.5 metres below ground surface (m bgs) or to refusal. The refusal depth was dictated by the presence of bedrock that varied in depth across the Site. Aside from the depth to bedrock, field screening was used to assist with final determination of test pit depths.

The soil conditions encountered during test pitting, and the results of field testing, were recorded and logged in the field by Golder staff, and were reported on the test pit logs. Soil samples were collected for environmental testing as described in the subsections below

The test pit spoils were stockpiled and the backfill material was placed in each test pit in the reverse order it was excavated upon completion. The material was nominally compacted during backfilling using the excavator bucket and tracks. Some settlement in the vicinity of the test pits may occur. Where available, mulched wood was placed on top of the backfilled test pits. Following completion, test pit locations were surveyed by Vector Geomatics Land Surveying Ltd. (Vector) of Fort St. John, BC (refer to Section 4.11).

Copies of the test pit logs are included in Appendix C.

4.6 Hand-Dug and Hand Auger Investigation

The hand auger and hand-dug investigation was carried out on 16 July and during the early stages of the 2017/2018 remediation program on 11 October 2017 and comprised completing 10 hand auger locations and seven hand-dug locations. An Eijkelkamp hand auger kit was used to complete the land auger locations and a spade shovel was used to complete the hand-dug locations.

The hand auger and hand-dug samples were completed to depths ranging from approximately 0.3 to 1.5 mbgs. These were located in areas where the source of contamination and its potential impact were suspected to be at shallow depth. Apart from limitations associated with the sampling method, field screening was used to assist with final determination of the hand dug and hand auger locations. The soil conditions encountered during the investigations, and the results of field testing, were recorded and logged in the field by Golder staff, and were reported on the hand auger and hand-dug logs. Soil samples were collected for environmental testing as described in the subsections below.

The hand auger and hand-dug spoils were stockpiled and the backfill material was placed hole in the reverse order it was excavated upon completion. The Copies of the hand-dug logs and hand auger logs are included in Appendix C.

4.7 Borehole and Monitoring Well Investigation

The borehole investigation and monitoring well installation were carried out between 18 and 27 July 2017. The work consisted of advancing 21 boreholes, at 19 locations, with two locations consisting of a shallow and deep well pair (K19-MW17-29 S and D and K19-MW17-35 S and D). The boreholes were advanced through the overburden soils into bedrock to depths ranging from 5.0 to 13.0 m bgs. The final depths of the boreholes were decided in the field based on field screening and depths to bedrock and the water table.

The boreholes were advanced using a D120 track-mounted drill rig supplied and operated by Tundra Environmental Drilling Services Ltd. of Stettler, AB (Tundra). Two drilling methods were used to advance the boreholes and included solid stem and rotary drilling using water as the drilling fluid. Water used for decontamination purpose was brought to Site by K & L Oilfield Holdings Ltd.

The investigation was carried out under the full-time supervision of Golder's staff who directed the drillers, collected samples and logged the subsurface conditions encountered. Soil samples were collected for environmental testing as described in the subsections below.

The drill cuttings were assessed by Golder in the field. Borehole cuttings with indications of contamination (e.g., hydrocarbon-like odour, staining or sheen) were placed in labelled woven plastic 'super sacks' and left on site for future disposal. One full (approximately 80%) filled sack was generated during the course of the field investigation (i.e. equal to approximately 0.8 m^3). Cuttings without indications of contamination were disposed of on the ground surface adjacent to the borehole. Monitoring wells were installed in all of the 21 boreholes as described in Section 4.7.1 below. Monitoring well construction details are provided as part of presentation of the borehole logs in Appendix D and summarized in Table 3.

Table 3: Well Completion Details

Well	Surveyed easting and northing (m; NAD83 UTM Z10N)		Surveyed elevation of ground surface (m asl)	Surveyed elevation of top of well casing (m asl)	Depth of sand pack interval, measured at time of installation (m bgs)		Depth of well screen interval, measured at time of installation (m bgs)		Depth of end-of-borehole, measured at time of drilling (m bgs)
	Easting	Northing			Top	Bottom	Top	Bottom	
K19-MW17-17	6398919	503287	859.922	860.706	6.2	8.1	6.5	8.0	8.1
K19-MW17-18	6398860	503266	862.061	862.916	4.7	6.8	5.0	6.5	13.0
K19-MW17-19	6399125	503402	857.14	857.799	4.8	8.2	5.1	8.1	8.2
K19-MW17-20	6398852	503233	862.267	862.891	3.7	5.8	4.0	5.5	7.0
K19-MW17-21	6398786	503195	863.765	864.431	8.2	10.1	8.5	10.0	10.0
K19-MW17-22	6398801	503243	864.242	864.955	7.2	9.3	9.0	7.5	10.0
K19-MW17-23	6398703	503137	864.201	864.954	9.7	13.0	10.0	13.0	13.0
K19-MW17-24	6398679	503068	861.611	862.519	3.2	5.2	3.5	5	5.2
K19-MW17-25	6398714	502999	855.426	856.308	4.7	6.7	5.0	6.5	6.7
K19-MW17-26	6398748	503117	862.112	862.828	8.4	10.0	9.4	10.9	10.9
K19-MW17-27	6398786	503085	859.22	860.027	6.95	8.8	7.25	8.75	8.8
K19-MW17-28	6398958	503137	854.105	854.874	5.7	7.8	6.0	7.5	8.5
K19-MW17-29D	6399077	503239	854.333	854.04	7.5	9.6	7.8	9.3	10.4
K19-MW17-29S	6399079	503240	854.303	854.09	3.1	5.2	3.4	4.9	5.5
K19-MW17-30	6398460	502962	861.58	862.505	6.8	8.7	7.1	8.6	8.7
K19-MW17-31	6398437	502998	861.707	862.58	4.7	6.5	5.0	6.5	6.8
K19-MW17-32	6399063	503380	857.272	858.17	3.2	5.3	3.5	5.0	5.6
K19-MW17-33	6398670	502937	851.956	852.742	3.2	5.3	3.5	5.0	5.6
K19-MW17-34	6398676	502977	855.19	856.073	4.6	6.5	4.9	6.4	6.5
K19-MW17-35D	6399058	503217	854.624	854.465	6.1	7.9	6.4	7.9	8.1
K19-MW17-35S	6399058	503218	854.555	854.446	3.2	5.0	3.5	5.0	5.0

m asl = metres above sea level
m bgs = metres below ground surface

4.7.1 Monitoring Well Installation and Development

A groundwater monitoring well was installed in the 21 boreholes that were drilled. The monitoring wells were assembled without the use of glues or solvents. The well risers were constructed of 51 millimetre (mm) diameter, Schedule 40, threaded PVC pipe. The well screens were constructed of 1.5 to 3 metre length sections of No. 10 size slotted PVC pipe. A clean filter sand pack was placed around the screened portion of the wells to minimize the entry of fines into the well and allow the flow of water into the well. A sand pack was installed from the base of the borehole to approximately 0.3 metres above the top of the screen. A bentonite or grout seal was placed above the sand pack, and was used to fill the annular space between the well and the borehole wall to ground surface. Each monitoring well was completed at surface with a locked steel protective monument casing or a steel roadbox and secured with concrete. Monitoring well construction details are included in the borehole logs attached in Appendix D and are summarized in Table 3.

The newly-installed wells were developed between 19 and 29 July 2017. A total of 22 monitoring wells were developed: K19-MW17-17 to -35S and K19-MW17-10, which was installed in January 2017 but was dry during that program.

The water level in the wells were measured prior to development using a water level tape and well volumes were calculated based on these values. Where possible, at least six (6) well volumes were removed from the wells using high-density polyethylene (HDPE) tubing, Waterra™ inertial foot valves and a hydrolift pump or using a peristaltic pump. While purging the wells (target of six volumes), measurements of pH, temperature, dissolved oxygen, redox, and conductivity were recorded. The wells were purged until physical parameters (conductivity, pH, dissolved oxygen, redox, and temperature) stabilized. If well recharge rates were insufficient to remove six well volumes, the well was purged dry a minimum of three times.

Monitoring well development field sheets are provided in Appendix E.

4.8 Environmental Sampling

4.8.1 Soil and Sediment

Representative environmental samples were collected during the test pit, borehole, hand-auger and hand-dug investigations. Where soil vapour screening on recovered soils/sediment was feasible, a portion of the discrete soil/sediment sample was placed in a headspace bag which was then sealed. After a period of approximately 5 to 10 minutes, the probe of a MiniRAE 3000 photo-ionisation detector (PID) was inserted into a corner of the headspace bag to obtain a measurement of the total organic vapour concentration in the headspace. The PID was calibrated to 100 parts per million (ppm) isobutylene gas, as per operating instructions, and was re-checked for calibration on a daily basis throughout the investigation program. Results of the vapour headspace screening were used to support the selection of samples for laboratory analysis along with the sample depth, field observations of stratigraphy and/or visual evidence of contamination.

Representative soil/sediment samples were collected and submitted for potential laboratory analysis. Each sample jar was labelled, registered on a chain-of-custody (CoC) form, packed in cardboard boxes and placed in a cooler with ice for transport to the laboratory. Appropriate preservatives, prepared by the laboratory, were used to preserve samples where appropriate. Soil/sediment samples were selected for analysis were chosen based on visual observation, the stratigraphy encountered, the depth, the location, the specific AEC/APEC, and the COC/PCOCs to be investigated at that particular location, and the results of field headspace screening. Analysis included total metals, benzene, toluene, and xylene (BTEX) parameters; volatile petroleum hydrocarbons (VPH); volatile organic compounds (VOCs); light and heavy extractable hydrocarbons (LEPH/ HEPH); polycyclic aromatic hydrocarbons (PAHs); sodium and chloride ions by saturated paste method and glycols. One soil sample was also analysed for toxicity characteristic leaching procedure (TCLP) leachable BTEX analysis and one sample was analyzed for pesticides.

4.8.2 Groundwater and Surface Water

Groundwater samples were collected from the 21 newly-installed wells and from 29 existing wells from 13 to 29 July 2017. The wells sampled included K19-MW17-01D, -01S, -02, -05, -06, -07, -04, -10, -11, -12, -13, -17, -18, -19, -20, -21, -22, -23, -24, -25, -26, -27, -28, -29D, -29S, -30, -31, -32, -33, -34, -35D, -35S; K19A-09MW-03, -02, -06, -09; K19A-10MW-10, -03, -24; K19B-10MW-15; K19-MW16-01D, -03D, -05, -07D, -07S, -10D, -10S, -12D, -12S, -14; the locations of which are shown on Figures 2, and 7 to 11. Monitoring well sampling field forms are provided in Appendix E.

Prior to sampling, an interface probe meter was used to measure the depth to groundwater in each monitoring well, as in addition to the thickness of any non-aqueous phase liquid (NAPL) hydrocarbons, if present. Where possible, groundwater sampling was conducted using dedicated high density polyethylene (HDPE) tubing and a low flow peristaltic pump to minimize agitation during sampling. Four locations were sampled with a Teflon® bailer as the depth to water was beyond the capacity of the peristaltic pump. The sampling method for each well is indicated in Table 6.

While purging the wells, measurements of pH, temperature, dissolved oxygen, redox, and conductivity were recorded. Once these parameters had stabilized (i.e., changes between three successive measurements were less than ten percent), or three well volumes had been purged, groundwater samples were collected.

Groundwater samples were collected using standard Golder sampling techniques for laboratory analysis of the PCOCs. Field duplicates were analysed at an approximate frequency of 10 percent for quality control purposes. Purge water with no indications of sheen, petroleum odour or NAPL was poured slowly on to the ground surface approximately 5 m from the well that it was collected from. Groundwater with indications of petroleum hydrocarbon contamination were stored in covered buckets and left onsite for future disposal. Low yield wells were purged dry and allowed to recharge prior to sampling. Monitoring well sampling field forms are provided in Appendix E.

Ten (10) surface water samples were collected from a Wetlands C and D and nearby watercourses on the northwestern side of the Site (Figure 2). The grab samples were collected by carefully lowering the laboratory-supplied sampling jars directly into the surface water. Surface water sampling field forms are provided in Appendix F.

Water samples were collected in laboratory prepared and supplied containers with appropriate preservatives. Samples were labelled, registered on chain-of-custody forms, stored on ice in coolers and delivered by Golder personnel to AGAT Laboratories (AGAT) located in Fort St. John, BC or Fort Nelson, BC. Groundwater samples were analyzed for dissolved metals, BTEX, VPH, VOCs, LEPH/HEPH, PAHs, glycols, pesticides and chloride. Surface water samples were analyzed for BTEX, VPH, VOCs, LEPH/HEPH, PAHs, glycols and chloride.

4.9 Groundwater Elevation Monitoring

Between 12 and 17 July 2017, groundwater levels were monitored for a select number of existing wells (i.e., wells installed prior to the July 2017 investigation) at the Site. Water levels were measured prior to the borehole drilling and test pit investigations in adjacent areas.

Groundwater elevations were calculated and those that were considered to be representative of static water table conditions were plotted and used to develop a contour map to assess groundwater flow within the bedrock at the Site. Wells were omitted from the contour map when they were not screened across the water table, or if the stratigraphic units in which they were screened deviated significantly in geological description.

A summary of the groundwater elevations is included in Appendix G.

4.10 Single-Well Response Tests

Single-well response tests (slug tests) were conducted at 4 monitoring wells (K19-MW17-28, K19-MW17-29D, K19-MW17-32 and K19-MW17-35D) between 28 and 30 July 2017, to estimate the hydraulic conductivity of the formation materials in the immediate vicinity of the well screens. The wells were selected based on stratigraphy to obtain the range of hydraulic conductivities in the newly-installed monitoring well locations. Each test was performed by displacing water in the well by rapidly removing 1 L with a bailer to obtain a corresponding rising-head test. Prior to and following initial water level displacement, continuous water levels were recorded using a Solinst Levelogger pressure transducer. Periodic manual water level readings were also recorded to confirm the data collected by the pressure transducer. Water level monitoring continued until the water level in the well returned to apparent static conditions. One Solinst Barologger pressure transducer was also deployed at the Site to monitor changes in barometric (i.e., atmospheric) pressure over the duration of the hydraulic testing program.

Table 4 provides a summary of the locations where slug tests were conducted.

Table 4: Summary of Slug Test Locations

Location	Depth of Screened Interval (m bgs)		Screened Stratigraphic Unit[1]
	Top	Bottom	
K19-MW17-28	6.0	7.5	Siltstone bedrock, moderately weathered (W3)[2]
K19-MW17-29D	7.8	9.3	Siltstone bedrock, moderately to slightly weathered (W3-W2)[1]
K19-MW17-32	3.5	5.0	Siltstone bedrock, moderately to highly weathered (W3-W4)[2]
K19-MW17-35D	6.4	7.9	Siltstone bedrock, moderately weathered (W3)[2]

Notes:
m bgs = metres below ground surface
1) As noted in borehole logs, available in Appendix D.
2) Weathering level inferred based on drill response and drill cutting observations.

Following the field program, the data from the transducers were downloaded, reduced and compensated for changes in barometric pressure. Slug test data were analyzed using the Bouwer-and-Rice (1976) solution incorporated in AQTESOLV™, a commercially available software package for aquifer test analysis. Based on the method (i.e., augers) used to advance the boreholes at K19-MW17-28, K19-MW17-32 and K19-MW17-35D, discrete fractures in the bedrock were not logged during drilling. Therefore, the results of the single-well response tests were interpreted assuming that groundwater flow is across the screened interval. For each slug test, both raw and barometrically-compensated pressure data were analysed to estimate hydraulic conductivity values.

The results of single well response tests are included in Appendix H.

4.11 Survey

The newly established test pit and monitoring well locations and elevations were surveyed by Vector. Monitoring wells were surveyed at ground surface and top of casing. The ground surface and a grid within AEC 1b and AEC 1c was also surveyed for use during the proposed remediation program in Q3 2017/2018. Surveying was conducted using a real-time kinetic (RTK) GPS. A RTK base station was established at a local monument and corrections were transmitted via laser level loops (Leica Sprinter 250M). The ground station was located using the Canadian Spatial Reference System with Precise Point Positioning (CSRS-PPP). Position accuracy varied depending upon the distance from the reference station and the number of stations used in the position calculation. RTK positioning was set to an industry standard of one centimetre (cm) or less.

4.12 Laboratory Analysis

AGAT was contracted by PWGSC to analyse the soil, sediment, groundwater and surface water samples collected as part of the investigation. AGAT is certified by the Canadian Association for Laboratory Accreditation (CALA) for the analyses undertaken.

The quality of the generated laboratory data was assessed using the appropriate laboratory quality control samples and laboratory quality replicate samples. Quality control samples consisted of analytical method blanks, analysis of reference material, laboratory replicate samples and laboratory spikes.

Laboratory certificates of analysis (COAs) and corresponding chain-of-custody forms are included in Appendix I.

4.13 Soil Vapour Modeling

Prior to mobilizing to the field in July 2017, soil vapour partition modelling was conducted within existing APECs that were investigated as part of the previous investigation (where detectable concentrations of volatile hydrocarbons were noted). The partition modeling was conducted based on available soil and groundwater data for each APEC, and was used as a preliminary screening tool to determine if any of the previously investigated APECs had predicted vapour concentrations that would exceed outdoor air standards and require the installation of soil vapour probes. Soil and groundwater results within AECs were not considered during the modeling because of the remedial plan to excavate soil contaminated with petroleum hydrocarbons.

Following the July 2017 field investigation, soil vapour partition modelling was also completed for detectable soil and/or groundwater concentrations of volatile petroleum hydrocarbons that are regulated under Schedule 3.3 of the CSR. The partitioning modeling was conducted in accordance with BC MoE Technical Guidance #4 (MoE 2017a) and Protocol 22 (MoE 2017b), to estimate soil vapour concentrations. A Site visit conducted as part of the July 2017 investigation identified the presence of a residential structure within 30 m of the Site boundary. Two sampling locations (K19-MW16-07D and K19-MW16-07S) were considered to be within 30 m of the structure. As such, indoor air exposure was considered applicable for modeling results from these two sampling locations. This is considered to be in accordance with BC MoE Technical Guidance 4.

The output generated showing the petroleum hydrocarbon parameters with detectable concentrations for soil and groundwater, as well as a detailed description of the approach to the soil vapour modeling, are presented in Appendix J.

4.14 Quality Assurance/Quality Control

4.14.1 Field Procedures

To assess and document that the sampling and analytical data are interpretable, meaningful, and reproducible, conformance to a Golder quality assurance/quality control (QA/QC) program was followed. Standard industry field procedures were used throughout the field investigation to ensure that reproducibility would be achieved. This involved using QA/QC measures in both the collection (field program) and analysis (laboratory) of samples. A detailed description of the QA/QC procedures and a discussion of the results of the QA/QC program are presented in Appendix K.

4.14.2 Data Transfer

Standard Golder data quality checks were completed to verify that electronic and manual data transfers (e.g., compilation of data into tables) were complete and that potential for errors was minimized.

4.14.3 Laboratory Analysis

AGAT Laboratories (AGAT) was contracted by PWGSC to analyse the groundwater and soil samples collected as part of the investigation. AGAT is certified by the Canadian Association for Laboratory Accreditation (CALA) for the analyses undertaken.

The quality of the generated laboratory data was assessed using the appropriate laboratory quality control samples and laboratory quality replicate samples. Quality control samples consisted of analytical method blanks, analysis of reference material, laboratory replicate samples and laboratory spikes.

5.0 RESULTS OF THE INVESTIGATION PROGRAM

This section of the report presents the results of the July 2017 investigation program, including a summary of field observations, analytical soil and groundwater laboratory results, the results of soil vapour modeling, and the results of QA/QC analyses.

5.1 Field Observations

5.1.1 Soil and Weathered Bedrock

The soil encountered during the drilling, test pit and hand-auger investigations generally consisted of overburden soil overlying weathered bedrock, as follows:

- A layer of clayey silt and clay. The layer contained some gravel and wood debris at selected locations and was observed from ground surface to depths ranging from 0.8 metre (m) below ground surface (bgs) to 2 m bgs.
- Weathered siltstone (bedrock), also referred to as residual soil. The weathering of the bedrock generally decreased with increasing depth. Weathered bedrock was observed from approximately 0.8 m bgs (at K19-TP17-30) to the maximum depth of completion of the boreholes and test pits (13.0 m bgs) ranging from highly/completely weathered (residual soils) along the top of its profile to slightly/moderately weathered near its base. The depth of competent bedrock varied across the Site but generally occurred between 3 and 7 m bgs.

Visual and olfactory indicators of potential soil contamination (i.e., staining, odours, and/or debris) were assessed and recorded during soil sample collection and noted on the borehole and test pit logs. Field measurements were collected using a PID, and ranged from 0.0 ppm to 436.3 ppm. The maximum PID reading was observed at a depth of 3.4 to 3.7 m bgs at K19-MW17-29S, within AEC 1b. Observations of petroleum hydrocarbon-like odour and sheen/staining for each location are summarized in Table 5.

Table 5: Borehole, Monitoring Well, Test Pit and Hand Auger Field Observations

Location	Depth (m)	Sheen/ Staining	Petroleum Hydrocarbon-like Odour	Highest PID (ppm)	Depth of Highest PID	Comments
K19-TP17-51	4.9	Iron staining	No	1.2	4.9	Water seeping at 4.6 mbgs
K19-TP17-52	4.0	Iron staining	Very slight	5.5	0.8	Water seeping at 4.0 mbgs, sheen on standing water
K19-TP17-53	4.0	Iron staining	No	1.0	4.0	-
K19-TP17-54	4.1	Iron staining	No	1.8	4.1	Water seeping at 3.2 mbgs
K19-TP17-55	4.0	Iron staining	No	1.2	4.0	-
K19-TP17-56	4.0	Iron staining	No	2.8	4.0	-
K19-TP17-57	4.0	Iron staining	No	4.5	2.5	Drainage pipe noted at 1.2 mbgs
K19-TP17-58	4.0	Iron staining	No	0.9	4.0	Steel pipe observed at 2 mbgs, concrete pipe observed at 3.0 mbgs

Location	Depth (m)	Sheen/ Staining	Petroleum Hydrocarbon-like Odour	Highest PID (ppm)	Depth of Highest PID	Comments
K19-TP17-59	4.0	Iron staining	No	0.8	2.6	-
K19-TP17-60	4.2	Iron staining	No	1.8	3.7	-
K19-TP17-61	4.4	Iron staining	Very slight	8.1	1.5	Water seeping at 3.7 mbgs
K19-TP17-62	4.2	Iron staining	No	1.6	1.7, 3.6	Steel wire at 0.6 mbgs
K19-TP17-63	4.0	Iron staining	Yes	112.4	1.9	
K19-TP17-64	4.2	Iron staining	No	0.5	4.2	Water seeping at 4.0 mbgs
K19-TP17-65	4.1	No	No	0.6	0.5, 2.6	Water seeping at 3.6 mbgs
K19-TP17-66	4.1	Iron staining	No	0.7	2.5, 4.1	Water seeping at 3.7 mbgs
K19-TP17-67	4.1	Iron staining	No	0.7	2.5	-
K19-TP17-68	4.1	Iron staining	Yes	271.4	2.5	-
K19-TP17-69	5.1	No	No	8.4	2.6	-
K19-TP17-70	4.9	No	No	21.6	3.5	-
K19-TP17-71	4.2	Iron staining	No	5.6	0.5	-
K19-TP17-72	4.0	No	No	3.1	4.0	Water seeping at 0.8 mbgs
K19-TP17-73	2.5	Iron staining	No	3.2	0.5	Water seeping at 1.2 mbgs, iron bar/plate at 1.0 mbgs, metal pipe observed at 1.3 mbgs, metallic sheen on standing water
K19-TP17-74	3.2	Iron staining	No	0.7	1.6, 2.7	-
K19-TP17-75	3.0	No	No	1.1	3.0	-
K19-TP17-76	3.2	Iron staining	No	1.6	3.2	-
K19-TP17-77	3.3	No	No	0.8	3.3	-
K19-TP17-78	3.2	No	No	0.9	3.2	Water seeping at 2.8 mbgs
K19-TP17-79	3.0	No	No	2.8	3.0	Air bubbling from below standing water
K19-TP17-80	4.3	Iron Staining	Yes	209.4	2.6	-
K19-TP17-81	3.5	Iron staining	Very slight	10.3	2.6	Steel pipe and clay drainage pipe observed at 0.3 mbgs
K19-TP17-82	4.2	Iron staining	Very slight	17.5	1.4	-
K19-TP17-83	3.9	No	No	1.0	3.9	-
K19-TP17-84	4.0	Iron staining	No	1.0	1.6, 2.5	-
K19-TP17-85	4.1	No	No	0.8	1.5	Metal pipe observed at 1.7 mbgs and concrete pipe observed at 2.2 mbgs
K19-TP17-86	4.0	Iron staining	No	0.7	4.0	Water seeping at 0.4 mbgs
K19-TP17-87	4.8	No	No	5.4	2.8	Water seeping at 0.4 mbgs
K19-MW17-17	8.1	No	Yes	329.1	5.2 – 5.8	-
K19-MW17-18	13.0	No	Yes	144.4	7.5 – 8.5	-
K19-MW17-19	8.2	No	No	8.7	1.8 – 2.1	-
K19-MW17-20	7	No	Yes	22.8	5.8 – 6.8	-
K19-MW17-21	10.1	No	No	16.4	9.0 – 10.0	-
K19-MW17-22	10.0	No	No	55.6	9.0 – 10.0	-

Location	Depth (m)	Sheen/ Staining	Petroleum Hydrocarbon-like Odour	Highest PID (ppm)	Depth of Highest PID	Comments
K19-MW17-23	13.0	No	No	24.2	4.5 – 5.0	-
K19-MW17-24	5.2	No	No	7.1	3.0 – 3.5	-
K19-MW17-25	6.7	No	No	5.2	4.5 – 5.0	-
K19-MW17-26	11.8	No	No	21.8	8.0 – 8.8	-
K19-MW17-27	8.75	No	No	15.8	8.0 – 8.75	-
K19-MW17-28	8.5	No	No	10.1	8.0 – 8.5	-
K19-MW17-29D	10.4	Iron staining	Yes	2.6	2.0 – 2.5	-
K19-MW17-29S	5.5	No	Yes	436.3	3.4 – 3.7	-
K19-MW17-30	8.7	No	No	8.7	8.0 – 8.7	-
K19-MW17-31	6.8	No	No	14.8	6.4 – 6.8	-
K19-MW17-32	5.6	No	No	12.5	3.5 – 4.0	-
K19-MW17-33	5.6	No	No	9.9	5.0 – 5.5	-
K19-MW17-34	6.5	No	No	14.2	6.0 – 6.5	-
K19-MW17-35D	8.1	No	Yes	170.3	4.0 – 4.5	-
K19-MW17-35S	5.0	No	Yes	170.3	4.0 – 4.5	-
K19-HA17-01	0.65	No	No	3.4	0.40 – 0.60	Adjacent to inferred concrete pad
K19-HA17-02	0.65	No	No	0.0	0.45 – 0.65	-
K19-HA17-03	0.40	No	No	0.1	0.25 – 0.40	-
K19-HA17-04	0.65	No	No	0.5	0.40 – 0.50	-
K19-HA17-05	0.30	No	No	0.2	0.20 – 0.30	-
K19-HA17-06	1.5	No	No	0.9	1.4 – 1.5	-
K19-HA17-07	0.5	No	No	0.8	0.35 – 0.50	-
K19-HA17-08	1.1	No	No	1.0	0.70 – 1.10	-
K19-HA17-09	1.5	No	No	0.0	-	-
K19-HA17-10	1.5	No	No	0.0	-	-
K19-HD17-01	0.4	No	No	0.2	0.4	-
K19-HD17-02	0.4	No	No	0.4	0.4	Metal debris observed at 0.4 m bgs
K19-HD17-03	0.35	No	No	0.6	0.35	-
K19-HD17-04	0.41	No	No	0.1	0.41	-
K19-HD17-05	0.38	No	No	-	0.38	-
K19-HD17-06	0.4	No	No	1.0	0.4	-
K19-HD17-07	0.28	No	No	0.2	0.28	-

5.1.2 Groundwater

Petroleum hydrocarbon-like odours and sheen were noted from the water recovered from monitoring well K19-MW17-01S and K19-MW17-35D located in AEC 1B. Stabilized field parameters were measured in the groundwater at the conclusion of purging and prior to sampling. The field parameter data are provided in Table 6.

Depth to groundwater was measured prior to sampling each well between 12 and 29 July 2017. The groundwater measurements, are presented in Appendix G.

Table 6: Summary of Field Parameters Measured in Groundwater, July 2017

Monitoring Well	Temperature (ºC)	pH	Specific Conductance (µS/cm)	Redox (mV)	Dissolved Oxygen (mg/L)	Sampling Method	Comments
K19A-09MW-02	5.2	6.84	2614	5.4	3.78	Peristaltic	
K19B-09MW-03	6.9	7.40	646.7	-121.4	0.09	Peristaltic	Clear
K1A9-09MW-06	5.7	6.18	643.3	-22.1	2.30	Peristaltic	
K19A-09MW-09	5.3	5.81	2856	18.2	1.51	Peristaltic	Clear
K19A-10MW-03	6.1	6.83	1092	-121.1	2.55	Peristaltic	Clear
K19-10MW-10	7.2	6.40	199.0	47.3	13.35	Peristaltic	
K19B-10MW-15	6.3	6.63	415.1	-49.9	0.36	Peristaltic	Clear
K19-10MW-24	7.2	6.29	1459	-17.7	9.06	Peristaltic	
K19-MW16-01D	6.7	6.49	1094	-45.6	3.46	Peristaltic	Metallic-like sheen, clear
K19-MW16-01S	-	-	-	-	-	-	Dry
K19-MW16-03D	6.8	6.77	1204	-75.1	2.54	Peristaltic	Clear
K19-MW16-03S	-	-	-	-	-	-	Dry
K19-MW16-05	7.3	6.40	961	-25.4	1.12	Peristaltic	Clear
K19-MW16-07D	5.8	7.41	672.5	-49.7	0.28	Peristaltic	Clear
K19-MW16-07S	7.4	6.79	832	15.5	0.60	Peristaltic	Clear
K19-MW16-10D	5.2	7.07	658.8	-15.2	1.42	Peristaltic	Clear
K19-MW16-10S	4.9	6.69	405.7	-12.9	7.65	Peristaltic	Clear
K19-MW16-12D	5.8	6.61	333.2	-22.4	2.12	Peristaltic	Clear
K19-MW16-12S	5.6	6.61	314.4	-14.8	2.63	Peristaltic	Clear
K19-MW16-14	7.1	6.35	1660	-19.4	3.19	Peristaltic	Clear
K19-MW17-01D	9.8	6.35	1372	-19.0	3.34	Peristaltic	Clear
K19-MW17-01S	9.9	6.45	1402	-74.0	1.44	Peristaltic	Hydrocarbon-like sheen and odour
K19-MW17-02	5.8	6.42	1281	-35.1	3.67	Peristaltic	-
K19-MW17-05	7.0	5.92	3014	3.4	3.88	Peristaltic	Metallic-like sheen
K19-MW17-04	8.0	6.80	603.3	27.7	2.91	Peristaltic	-
K19-MW17-06	5.0	6.99	1354	-23.0	8.39	Teflon Bailer	-
K19-MW17-07	9.8	6.31	42.1	38.4	6.98	Teflon Bailer	Clear
K19-MW17-10	6.9	5.81	2742	48.3	4.01	Peristaltic	Clear
K19-MW17-11	4.5	6.81	404.5	-19.8	8.17	Peristaltic	Clear
K19-MW17-12	12.3	6.85	769	13.3	3.46	Teflon Bailer	Clear
K19-MW17-13	5.7	6.79	507.1	-14.9	5.91	Peristaltic	-

Monitoring Well	Temperature (ºC)	pH	Specific Conductance (µS/cm)	Redox (mV)	Dissolved Oxygen (mg/L)	Sampling Method	Comments
K19-MW17-17	8.1	7.35	516.2	14.6	6.45	Peristaltic	Clear
K19-MW17-18	8.1	6.73	443.6	3.4	7.26	Peristaltic	Clear
K19-MW17-19	9.6	6.98	566.1	4.5	3.64	Peristaltic	Clear
K19-MW17-20	7.7	6.58	446.3	35.9	2.97	Peristaltic	Clear
K19-MW17-21	8.8	7.08	367.6	-15.5	0.65	Peristaltic	Clear
K19-MW17-22	8.7	7.35	520.1	-36.5	4.50	Peristaltic	Clear
K19-MW17-23	8.4	7.78	863	-7.2	3.33	Teflon Bailer	-
K19-MW17-24	6.5	6.96	437.0	-33.2	2.17	Peristaltic	Clear
K19-MW17-25	7.3	6.77	373.2	-4.3	6.29	Peristaltic	Clear
K19-MW17-26	13.5	6.80	825.0	-28.7	3.31	Peristaltic	Clear
K19-MW17-27	6.6	6.56	516.1	-0.7	1.71	Peristaltic	Clear
K19-MW17-28	6.3	6.17	458.6	-14.6	1.55	Peristaltic	Clear
K19-MW17-29D	7.4	6.51	857	-36.3	1.30	Peristaltic	Clear
K19-MW17-29S	12.9	6.49	1290	7.7	4.41	Peristaltic	Silty
K19-MW17-30	6.1	6.91	414.6	-23.4	2.95	Peristaltic	Clear, metallic like sheen
K19-MW17-31	7.6	7.19	473.5	-22.5	3.63	Peristaltic	Clear
K19-MW17-32	7.7	7.11	693.4	-9.8	6.12	Peristaltic	Clear
K19-MW17-33	6.6	6.40	334.8	-2.5	3.16	Peristaltic	Clear
K19-MW17-34	7.7	6.56	374.8	-12.4	2.32	Peristaltic	Clear
K19-MW17-35S	15.8	6.96	242.4	29.2	11.97	Peristaltic	Clear
K19-MW17-35D	6.5	6.58	490.9	-98.4	0.59	Peristaltic	Strong HC odour, metallic/HC like sheen

5.1.3 Surface Water

The field parameters were measured in the surface water prior to sampling and the data are provided in Table 7.

Table 7: Summary of Field Parameters Measured in Surface Water, June 2016

Location	Temperature (ºC)	pH	Specific Conductance (µS/cm)	Redox (mV)	Dissolved Oxygen (mg/L)	Comments
K19-SW17-01	13.5	7.27	282.3	-4.3	1.61	Clear to brown
K19-SW17-02	17.1	6.93	259.8	-184.9	4.22	-
K19-SW17-03	13.1	7.29	322.9	6	0.52	Silty
K19-SW17-04	11.7	6.12	44.4	42	1.71	-
K19-SW17-05	10	6.07	59.7	-78.9	6.04	Silty, opaque, brown
K19-SW17-06	9.9	5.74	34.5	54.2	2.19	-
K19-SW17-07	8.7	6.34	41.2	21.1	7.3	-
K19-SW17-08	9.1	6.81	76	43.3	9.83	Increased turbidity due to heavy rain event
K19-SW17-09	9.2	7.6	122.1	31.8	10.65	-
K19-SW17-10	10.6	5.86	32.7	69.1	3.09	Clear

No observations of petroleum hydrocarbon-like sheen or odour were noted in the water recovered from the surface water sample collected near the on-Site culverts (K19-SW17-07 and K19-SW17-08).

5.1.4 Sediment

Petroleum hydrocarbon-like sheen or odours were not observed from the sediment recovered sampling locations. Observations of petroleum hydrocarbon-like odour and sheen/staining for each location are summarized in Table 8. Samples were collected in Wetlands C and D, as shown Figures 12 to 15.

Table 8: Sediment Sampling Field Observations

Location	Depth (m)	Sheen/ Staining	Petroleum Hydrocarbon-like Odour	Highest PID (ppm)	Comments
K19-SS17-01	0.1	No	No	0.3	-
K19-SS17-02	0.1	No	No	1.3	-
K19-SS17-03	0.1	No	No	0.4	H_2S-like odour
K19-SS17-04	0.1	No	No	0.3	-
K19-SS17-05	0.1	No	No	0.3	-
K19-SS17-06	0.1	No	No	1.7	-
K19-SS17-07	0.1	No	No	0.6	-
K19-SS17-08	0.1	No	No	0.6	-

5.2 Groundwater Elevations and Gradient

The reported water levels and calculated groundwater elevations from the July 2017 monitoring event are shown in Appendix H.

Monitoring wells were not considered representative of the shallow groundwater table when they were screened in anomalous stratigraphic units, or when they were screened above the water table or several metres deeper than adjacent monitoring wells. Wells that were screened deeper than adjacent wells were interpreted to be more representative of groundwater conditions deeper in the bedrock, as there is a downward vertical gradient at the Site.

Groundwater elevation contours are presented on Figure 16. Groundwater within the bedrock is interpreted to flow towards the northwest, consistent with topography and an inferred regional groundwater flow direction towards the basin of the Minaker River. The direction of groundwater flow is consistent with those observed during previous events; however, when compared with water level data from the January 2017 event, the groundwater elevations were generally higher in July 2017, ranging from approximately 0.48 m higher in K19-MW16-02 to 2.11 m higher in K19-17-07. This seasonal pattern is interpreted to reflect greater groundwater recharge in the spring and summer months. The magnitude of the seasonal pattern did not exhibit a strong relationship with the depth of the monitoring well; however, the groundwater monitoring wells in the northeastern portion of the Site generally demonstrated less seasonal variation, with water levels in a number of monitoring wells in the area varying by less than 1.0 m.

The horizontal hydraulic gradients are estimated to range from over 0.3 in the southeastern portion of the Site near K19b-10MW-15 to approximately 0.0.7 in the northeastern portion of the Site near K19a-MW10-05. In general, a downward vertical gradient is observed in the bedrock. For example, a downward gradient of approximately 0.73 was calculated between the shallow and deep monitoring wells at K19-MW16-03 in July 2017, indicating potentially perched conditions in the weathered siltstone bedrock unit that the shallow well is screened across.

5.3 Hydraulic Conductivity

Field data sheets for the single-well response tests and the results of the AQTESOLV analyses are presented in Appendix H. As discussed in Section 4.10, both the raw and barometrically-compensated data were analysed and the calculated hydraulic conductivity values that were estimated from these data sets were similar. A summary of the results from the single-well response tests is presented in Table 9.

Table 9: Results of Hydraulic Conductivity Tests

Well	Estimated Hydraulic Conductivity (m/s)	Screened Stratigraphic Unit
K19-MW17-28	$4x10^{-7}$	Siltstone bedrock, moderately weathered (W3)[2]
K19-MW17-29D	$7x10^{-7}$	Siltstone bedrock, moderately to slightly weathered (W3-W2)[1]
K19-MW17-32	$4x10^{-7}$	Siltstone bedrock, moderately to highly weathered (W3-W4)[2]
K19-MW17-35D	$2x10^{-5}$	Siltstone bedrock, moderately weathered (W3)[2]

m/s = metres per second

1) Calculated hydraulic conductivity represents geometric mean of multiple tests
2) Weathering level inferred based on drill response and drill cutting observations

The hydraulic conductivity values estimated from the July 2017 slug testing ranged from $4x10^{-7}$ m/s to $2x10^{-5}$ m/s. This range is similar to the values reported for other wells at the Site, where hydraulic conductivity values ranged from $2x10^{-7}$ m/s at K19-MW16-15 to $5x10^{-5}$ m/s at K19-MW16-11 (Golder 2016a). Consistent with the results from previous investigations, the estimated hydraulic conductivity values from July 2017 do not exhibit a strong trend with well depth or across the Site. The variability observed in hydraulic conductivity values is inferred to represent heterogeneity in the weathering and fracturing of the bedrock. The single-well response test data were analysed assuming that groundwater flow was across the well screen and, therefore, are considered to be representative of the bulk bedrock. The hydraulic conductivities of the fractures within the bedrock are expected to be variable and the hydraulic conductivities of discrete fractures may be orders of magnitude higher than the values presented in Table 9 and previous investigations.

5.4 Chemical Analytical Results

Chemical laboratory certificates-of-analysis, with CoC forms, are provided in Appendix I. Interpretation of the chemical analytical data is provided in Section 6. Given that the remedial objectives for the Site are based on the CSR standards, for ease of presentation and interpretation of the data and, the analytical results section pertains to the CSR standards only (*i.e., the results of screening against applicable CCME guidelines are not presented here)*. For reference purposes, analytical data collected in July 2017 is presented alongside analytical data collected during previous stages of investigation at the Site.

5.4.1 Soil Analytical Results

This section of the report presents the analytical soil results that were assessed during the July 2017 investigation. Analytical results were screened against the applicable CSR WL Reverted (WL_R) and IL soil standards as well as the CCME guidelines for AL and RL/PL. MoE's Protocol 4 for Contaminated Sites applicable regional background soil quality estimates were applied when these values were higher (less conservative) then the applicable WL_R for specified inorganic substances (BC MOE 2017). Analytical results are presented on the following tables:

- Table 12 – Results of Soil Analyses – Metals and Inorganics
- Table 13 – Results of Soil Analyses – Petroleum Hydrocarbons and PAHs
- Table 14 – Results of Soil Analyses – Volatile Organic Compounds
- Table 15 – Results of Soil Analyses – Glycols
- Table 16 – Results of Soil Analyses – Pesticides
- Table 17 – Results of Soil Analyses – Leachable Volatiles

A visual display of sampling locations and analytical results (screened against the CSR standards) is shown on the following figures:

- Figure 3 – Soil Chemistry Results –Total Metals
- Figure 4 – Soil Chemistry Results –Sodium and Chloride (Saturated Paste)
- Figure 5 – Soil Chemistry Results – Petroleum Hydrocarbons, PAHs, BTEX and VPH
- Figure 6 – Soil Chemistry Results –Volatile Organic Compounds

5.4.1.1 Metals and Sodium and Chloride Ions

Eighty-two (82) soil samples were analyzed for total metals and/or sodium and chloride ions across the Site in the most recent investigation. These were targeted in areas with known salt contamination as well as random sampling to provide reasonable Site-wide coverage given that the absence of historical information on location of salt storage. For ease of reading, and given the heterogeneous nature of metal contamination, the results of metal parameters and sodium and chloride ions have been presented as a Site-wide contamination issue.

Overall, concentrations of arsenic, barium, beryllium, cadmium, cobalt, iron, manganese, nickel, selenium, zinc and/or chloride ions exceeded the applicable CSR WL_R and/or IL standards (or Protocol 4 regional background soil quality estimates) in 62 samples at 60 locations as shown on Figures 3 and Figure 4. These figures present the overall Site for delineation purposes, which includes the results for a total of 231 samples (including duplicates) analyzed for metals and/or sodium and chloride ions.

Metals

Seventy-two (72) soil samples were analyzed for total metals as part of the July 2017 investigation. Concentrations of one or more total metals exceeded the applicable CSR WL_R and/or IL standards (or Protocol 4 regional background soil quality estimates) in 31 soil samples at 30 locations. These analytical data are incorporated with the previous investigation data and are presented on Figure 3. A summary of the metals results from the July 2017 investigation is as follows:

- Twenty-nine (29) samples (included two field duplicate pairs) exceeded the applicable CSR WL_R and/or IL standards for arsenic at locations:
  - K19-MW17-35 (APEC 1b)
  - K19-HD17-02 and K19-MW17-32 (APEC 1d)
  - K19-TP17-52 (AEC 1e)
  - K19-MW17-28 and K19-TP17-55 (APEC 4)
  - K19-HD17-06 (APEC 6)
  - K19-MW17-31, K19-TP17-77 and K19-TP17-78 (APEC 11)
  - K19-MW17-30, K19-TP17-74 and K19-TP17-75 (APEC 12)
  - K19-TP17-58, K19-TP17-61, K19-TP17-80, K19-TP17-81, K19-TP17-82, and K19-TP17-85 (APEC 13)
  - K19-MW17-33 (APEC 14)
  - K19-MW17-34 and K19-TP17-86 (APEC 15)
  - K19-TP17-67 (APEC 16)
  - K19-MW17-24 (APEC 17)
  - K19-MW17-23 (APEC 18)
  - K19-MW17-26 (APEC 19)
  - K19-TP17-54 (APEC 23a)
  - K19-MW17-18 (APEC 24)

  The exceedances were observed in samples collected at depths ranging from 0.3 to 2.5 m bgs. The highest concentration was 1.4 times the applicable CSR WL_R and IL standards at a depth of 0.3 to 0.5 m bgs at location K19-MW17-31. No samples were analyzed for arsenic above or below that depth at location K19-MW17-31.
- Sixteen (16) samples (included three field duplicate pairs) samples exceeded the applicable CSR WL_R and/or IL standards for barium at locations:
  - K19-TP17-67 (AEC 1b)
  - K19-HD17-02 (APEC 1d)
  - K19-TP17-52 (AEC 1e)
  - K19-MW17-28 (APEC 4)
  - K19-HA17-06 (APEC 10b)
  - K19-HA17-08 (APEC 10a)
  - K19-TP17-77 (APEC 11)
  - K19-TP17-74 (APEC 12)
  - K19-TP17-81, K19-TP17-82, K19-TP17-85 and K18-TP17-86 (APEC 13)

  The exceedances were observed in samples collected at depths ranging from 0.3 to 2.5 m bgs. The highest concentration was more than 1.7 times the applicable CSR WL_R and IL standards at a depth of 0.6 m bgs at location K19-TP17-77. No samples were analyzed for barium above or below 0.6 m bgs at location K19-TP17-77.

- One field duplicate pair exceeded the applicable CSR WL_R and IL standards for beryllium at location K19-TP17-52 in AEC 1e. The exceedances were observed at approximately 0.8 m bgs with the highest observed concentration approximately 1.8 times greater than the applicable CSR WL_R and IL standards.
- Three (3) samples exceeded the applicable CSR WL_R and/or IL standards for cadmium at locations K19-MW17-18 (west of APEC 24) and K19-TP17-52 (approx. 20 m north of AEC 1e). The exceedances were observed at depths ranging from 0.3 to 0.8 m bgs and the highest concentration was observed to be more than 1.4 times the applicable CSR WL_R and IL standards at a depth of 0.8 m bgs at location K19-TP17-52. No samples were analyzed for cadmium above or below 0.8 m bgs at location K19-TP17-52.
- One (1) sample exceeded the applicable CSR WL_R standards for iron at location K19-HD17-02 in APECs/AECs 1d. The exceedance to the applicable iron standard was observed at a depth of 0.4 m bgs and observed to be marginally (1.02 times greater) than the applicable CSR WL_R standard at a depth of 0.4 m bgs. No samples were analyzed for iron above or below 0.4 m bgs at that location.
- One (1) sample analyzed exceeded the applicable CSR WL_R and IL standards for manganese at location K19-TP17-77 in APEC 11. The exceedance to the applicable manganese standards was observed at a depth of approximately 0.6 m bgs with the observed concentration more than 1.3 times the applicable CSR WL_R and IL standards.
- One (1) sample exceeded the applicable CSR WL_R and IL standards for nickel at location K19-TP17-77 in APEC 11. The exceedance was observed at a depth of approximately 0.6 m bgs with the observed concentration more than 1.3 times the applicable CSR WL_R and IL standards.
- Three (3) samples (including one duplicate pair) exceeded the applicable CSR WL_R and IL standards for zinc at locations K19-HD17-06 (APEC 6) and K19-MW17-18 (APEC 24). The exceedances to the applicable zinc standards was observed at depths ranging from 0.3 to 0.5 m bgs with the highest concentration more than 1.6 times the applicable CSR WL_R and IL standards.
- One (1) hand auger (K19-HA17-07) was completed away from known sources of contamination or previous activity (Figure 3) as part of the most recent investigation. Metals results were less than applicable standards.

Sodium and Chloride Ions

Forty-six (46) soil samples were analyzed for sodium and chloride ions as part of the July 2017 investigation. Concentrations of sodium and/or chloride ion exceeded the applicable WL_R and/or IL standards in two (2) samples at K19-HA17-04 at 0.4-0.6 m bgs (included a duplicate) which was located in close proximity to AEC 1b. The highest chloride concentration observed at this location was more than 1.5 times the applicable CSR WL_R and IL standards. These analytical data are incorporated with the previous investigation data and are presented on Figure 4 for overall planning and delineation purposes, which presents the results for a total of 150 samples (including duplicates).

5.4.1.2 Petroleum Hydrocarbon Parameters

As part of the July 2017 investigation, 170 soil samples were analyzed for petroleum hydrocarbons, PAHs, BTEX and VPH across the Site. Concentrations of benzene, toluene, ethylbenzene, EPH(C_6-C_{10}), LEPH, HEPH, VPH, VH(C_6-C_{10}) and naphthalene exceeded the applicable CSR WL_R and/or IL standards in ten (10) samples at three (3) locations. These analytical data are incorporated with the previous investigation data and presented on Figure 5 for overall planning purposes, which presents the results for a total of 503 samples (including duplicates).

AEC 1a

Five (5) hand augers were completed in the vicinity of AEC 1a. The sample results met the applicable CSR WL_R and/or IL standards for the petroleum hydrocarbons parameters analysed.

AEC 1b

Three (3) test pits and four (4) monitoring wells were completed within and in the vicinity of AEC 1b. The monitoring wells were to identify off-Site migration to the north and west of AEC1b. The test pits were aimed at refining limits of planned 2017/2018 remediation at AEC 1b. Eight (8) samples from sampling locations K19-MW17-29D and K19-MW17-35D exceeded the applicable CSR WL_R and/or IL standards for petroleum hydrocarbon parameters. Samples collected at depths of 2.5 to 2.8, 3.4 to 3.7 and 5.3 to 5.5 m bgs from K19-MW17-29D were analyzed for petroleum hydrocarbon parameters. The samples collected at depths of 2.5 to 2.8 and 3.4 to 3.7 m bgs exceeded applicable CSR WL_R and IL benzene standards. Concentrations of benzene were also more than 2 times the applicable CSR IL standard from 3.4 to 3.7 m bgs. No exceedances of the applicable CSR WL_R and/or IL standards was observed the samples collected from 5.3 to 5.5 m bgs.

Samples collected at depths of 1.0 to 1.5, 2.5 to 3.0, 4.0 to 4.5 and 6.5 to 7.0 from K19-MW17-35D were analyzed for petroleum hydrocarbon parameters. The samples collected at the above depths exceeded the applicable CSR WL_R and/or IL standards for benzene and/or naphthalene. Concentrations of benzene were up to thirteen (13) times greater than the applicable CSR WL_R and/or IL standard for benzene. No samples were analyzed below 7.0 m bgs because the PID values were <10 ppm.

AEC/APEC 1d

Four (4) hand augers and one monitoring well were completed within AEC/APEC 1d (Figure 5) as part of the most recent investigation. Sample results met the applicable CSR WL_R and/or IL standards for petroleum hydrocarbons parameters.

AEC 1e

Three (3) test pit locations were completed at AEC 1e (Figure 5) as step outs to previous exceedance identified at K19A10-TP05 as part of the most recent investigation. The sample results analyzed met the applicable CSR WL_R and/or IL standards for petroleum hydrocarbons.

APEC 4

Four (4) test pit locations and one (1) monitoring well were completed at APEC 4 (Figure 5) as part of the most recent investigation to assist with lateral delineation around the suspect UST(s). The sample results met the applicable CSR WLR and/or IL standards for petroleum hydrocarbons.

APEC 5

One (1) monitoring well was completed downgradient of APEC 5 (Figure 5) as part of the most recent investigation in order to address a data gap identified during the previous investigations regarding representative groundwater data within or immediately downgradient of APEC 5. All samples analyzed met the applicable CSR WL_R and/or IL standards for petroleum hydrocarbons.

APEC 6

Three (3) hand-dug locations and one (1) monitoring well were completed within the inferred extent APEC 6 (Figure 5) as part of the most recent investigation. All samples analyzed met the applicable CSR WLR and/or IL standards for petroleum hydrocarbons.

APEC 7b

One (1) test pit was completed in the vicinity of APEC 7b (Figure 5) as part of the most recent investigation. This test pit also assisted with further refinement of remediation limits for AEC 23a. The sample results met the applicable CSR WL_R and/or IL standards for petroleum hydrocarbons.

APEC 9

Due to access restrictions, two (2) hand auger samples were was collected within the inferred area of APEC 9 (Figure 5) as part of the most recent investigation. The sample results met the applicable CSR WL_R and/or IL standards for petroleum hydrocarbons.

APEC 10a

Due to access restrictions, one (1) hand auger was completed within the inferred area of APEC 10a (Figure 5) as part of the most recent investigation. The sample results met the applicable CSR WL_R and/or IL standards for petroleum hydrocarbons.

APEC 10b

Due to access restrictions, one (1) hand auger was completed within the inferred area of APEC 10b (Figure 5) as part of the most recent investigation. The sample results met the applicable CSR WL_R and/or IL standards for petroleum hydrocarbons.

APEC 11

Two (2) test pits and one (1) monitoring well were completed at APEC 11 (Figure 5) as part of the most recent investigation. The sample results met the applicable CSR WL_R and/or IL standards for petroleum hydrocarbons.

APEC 12

Three (3) test pits and one (1) monitoring well were completed in APEC 12 (Figure 5) as part of the most recent investigation. The sample results met the applicable CSR WL_R and/or IL standards for petroleum hydrocarbons.

APEC 13

Nine (9) test pits were completed in of APEC 13 (Figure 5) as part of the most recent investigation. The sample results met the applicable CSR WL_R and/or IL standards for petroleum hydrocarbons.

APEC 14

One (1) monitoring well was completed downgradient of APEC 14 (Figure 5) as part of the most recent investigation. All samples analyzed met the applicable CSR WL_R and/or IL standards for petroleum hydrocarbons.

APEC 15

One (1) monitoring well was completed downgradient of APEC 15 (Figure 5) as part of the most recent investigation in order to address a data gap identified during the previous investigations regarding representative groundwater data within or immediately downgradient of APEC 15. All samples analyzed met the applicable CSR WL_R and/or IL standards for petroleum hydrocarbons.

APEC 16

One (1) test pit and one (1) monitoring well were completed within and in the vicinity of APEC 16 (Figure 5) as part of the most recent investigation. All samples analyzed met the applicable CSR WL_R and/or IL standards for petroleum hydrocarbons.

APEC 17

Two (2) test pits and one (1) monitoring well were completed within and in the vicinity of APEC 17 (Figure 5) as part of the most recent investigation. All samples analyzed met the applicable CSR WL_R and/or IL standards for petroleum hydrocarbons.

APEC 18

One (1) monitoring well was completed downgradient of APEC 18 (Figure 5) as part of the most recent investigation in order to address a data gap identified during the previous investigations regarding representative groundwater data within or immediately downgradient of APEC 18. All samples analyzed met the applicable CSR WL_R and/or IL standards for petroleum hydrocarbons.

APEC 19

One (1) monitoring well was completed downgradient of APEC 19. The analytical data are incorporated with the previous investigation and presented in Figure 5. Two (2) samples from sampling location K19-MW17-26 exceeded the applicable CSR IL standards for petroleum hydrocarbon parameters. Samples collected at depths of 8.0 to 8.8 m bgs and 11.0 to 11.8 m bgs exceeded applicable CSR IL toluene standards. Concentrations of toluene were two times greater than the applicable CSR IL standards from 8.0 to 8.8 m bgs. No samples were analyzed for petroleum hydrocarbon parameters at depths greater than 11.8 m bgs at this location, because the borehole was terminated at this depth.

APEC 20

One (1) monitoring well was completed downgradient of APEC 20 (Figure 5) as part of the most recent investigation in order to address a data gap identified during the previous investigations regarding representative groundwater data within or immediately downgradient of APEC 20. All samples analyzed met the applicable CSR WL_R and/or IL standards for petroleum hydrocarbons.

APEC 21

One (1) monitoring well was completed downgradient of APEC 21 (Figure 5) as part of the most recent investigation in order to address a data gap identified during the previous investigations regarding representative groundwater data within or immediately downgradient of APEC 21. All samples analyzed met the applicable CSR WL_R and/or IL standards for petroleum hydrocarbons.

AEC 23a

Six (6) test pits were completed within AEC 23a (Figure 5) as part of the most recent investigation and in order to refine the previously inferred extent of this AEC. All samples analyzed met the applicable CSR WL_R and/or IL standards for petroleum hydrocarbons.

APEC 24

One (1) monitoring well was completed downgradient of APEC 24 (Figure 5) as part of the most recent investigation in order to address a data gap identified during the previous investigations regarding representative groundwater data within or immediately downgradient of APEC 24. All samples analyzed met the applicable CSR WL_R and/or IL standards for petroleum hydrocarbons.

APEC 25

One (1) monitoring well was completed in APEC 25 (Figure 5) as part of the most recent investigation in order to address a data gap identified during the previous investigations regarding representative groundwater data within or immediately downgradient of APEC 25. All samples analyzed met the applicable CSR WL_R and/or IL standards for petroleum hydrocarbons.

APEC 26

One (1) test pit and one (1) monitoring well were completed within and downgradient of APEC 26 (Figure 5) as part of the most recent investigation in order to address a data gap identified during the previous investigations regarding representative groundwater data within or immediately downgradient of APEC 25. All samples analyzed met the applicable CSR WL_R and/or IL standards for petroleum hydrocarbons.

APEC 27

One (1) test pit and one (1) monitoring well was completed in APEC 27 (Figure 5) as part of the most recent investigation. All samples analyzed met the applicable CSR WL_R and/or IL standards for petroleum hydrocarbons.

5.4.1.3 Volatile Organic Compounds

Sixty (60) soil samples from 50 locations were analyzed for VOCs across the Site. The analytical data collected are incorporated with the previous investigation data and are presented in Figure 6¸ which presents the results for 210 samples analysed for VOCs (including duplicates).

None of the samples analyzed as part of the July 2017 investigation exceeded the applicable CSR WL_R and/or IL standards.

5.4.1.4 Glycols

Nine (9) soil samples from eight (8) locations were analyzed for glycols across the Site. The analytical data collected are incorporated with the previous investigation data and are presented in Table 15¸ which presents the results for a total of 13 samples (including duplicates).

None of the samples analyzed as part of the July 2017 investigation exceeded the applicable CSR WL_R and/or IL standards.

5.4.2 Groundwater Analytical Results

Fifty-six (56) groundwater samples, including six (6) field duplicates, were collected and were submitted for laboratory analyses as part of the July 2017 investigation, as described in Section 4.8.2. Analytical data are incorporated with the previous investigation data and presented in the following tables:

- Table 18 – Results of Groundwater Analyses – Dissolved Metals, Anions and Nutrients
- Table 19 – Results of Groundwater Analyses – Petroleum Hydrocarbons and PAHs
- Table 20 – Results of Groundwater Analyses – Volatile Organic Compounds
- Table 21 – Results of Groundwater Analyses – Glycols
- Table 22 – Results of Groundwater Analyses – Pesticides

A visual display of sampling locations is shown on the following figures:

- Figure 7 – Groundwater and Surface Water Chemistry Results – Dissolved and Total Metals
- Figure 8 – Groundwater and Surface Water Chemistry Results – Chloride Ion and Total and Dissolved Sodium
- Figure 9 – Groundwater and Surface Water Chemistry Results – Total and Dissolved Lithium
- Figure 10 – Groundwater and Surface Water Chemistry Results – Petroleum Hydrocarbons, PAHs, BTEX and VPH
- Figure 11 – Groundwater and Surface Water Chemistry Results – Volatile Organic Compounds

Analytical results were screened against the applicable CSR DW and AW groundwater standards as well as the FIGQG and Health Canada Drinking Water Guidelines.

5.4.2.1 Dissolved Metals

The fifty-six (56) groundwater samples analyzed as part of the most recent investigation contained exceedances of dissolved metals (not including dissolved sodium) relative to the applicable CSR DW and/or AW standards (Figure 7). Excluding the lithium exceedances, the remaining exceedances relative to the applicable CSR DW and/or AW dissolved metal standards were observed in 29 of the 56 samples. (Figure 7). The dissolved metals that exceeded the applicable CSR DW (22 locations) and/or AW standards (7 locations) included arsenic, barium, cobalt, selenium, strontium and uranium.

5.4.2.2 Chloride Ion and Dissolved Sodium

Forty-one groundwater samples were analyzed for sodium and chloride. Exceedances of chloride ion and/or dissolved sodium relative to the applicable CSR DW and/or AW standards were identified in six (6) monitoring wells (Figure 8). Two of the exceedances (K19-09MW-02, K19-09MW-06) were observed downgradient of AEC 1a and four (4) of the exceedances (K19-09MW-09, K19-10MW-24 K19-MW17-05 and K19-MW17-10) were observed in the vicinity of AEC 23. The locations of exceedances correlate well with locations were exceedances were identified in the soils

5.4.2.3 Petroleum Hydrocarbons, PAHs, BTEX and VPH

Exceedances of petroleum hydrocarbons, PAHs, BTEX and VPH, relative to the applicable CSR DW and/or AW standards, were identified in five (5) of the samples from four (4) monitoring wells (Figure 10). The exceedances were observed in monitoring wells within AEC 1b or downgradient of AEC 1b. The petroleum hydrocarbon parameters that exceeded the applicable CSR DW and/or AW standards included benzene, toluene, xylenes, LEPH, VPH(C_6-C_{10}), naphthalene and 1-methylnaphthalene. The only other exceedances at the Site were identified at AEC 1c as part of the earlier sampling programs.

5.4.2.4 Volatile Organic Compounds

Exceedances of volatile organic compounds relative to the applicable CSR DW standards were identified in three at two monitoring well locations of the 26 sampled (Figure 11). The exceedances were observed in monitoring wells K19-MW17-01S and K19-MW17-35D within or downgradient of AEC 1b. The VOCs parameters that exceeded the applicable CSR DW standard included 1,2-dichloroethane and 1,2-dichloropropane. The only other exceedances at the Site were identified at AEC 1c as part of the earlier sampling programs.

5.4.2.5 Glycols

Ten (10) samples for glycols were analyzed from ten (10) monitoring wells during the most recent investigation. None of the samples analyzed exceeded the applicable CSR DW and/or AW standards and all results were below the method detection limits (Tables 19 and 20).

5.4.3 Surface Water Analytical Results

Eleven (11) surface water samples, including one (1) field duplicate, were collected and submitted for laboratory analyses, as described in Section 4.8.2. Four samples were collected in the unnamed creek on the northern side of the Site (three samples were collected onsite and one sample was collected 150 m downgradient of the Site). The remaining samples were collected in Wetlands C and D. Analytical data are incorporated with the previous investigation data and presented in the following tables:

- Table 23 – Results of Groundwater Analyses – Dissolved Metals, Anions and Nutrients
- Table 24 – Results of Groundwater Analyses – Total Metals
- Table 25 – Results of Groundwater Analyses – Petroleum Hydrocarbons and PAHs
- Table 26 – Results of Groundwater Analyses – Volatile Organic Compounds
- Table 27 – Results of Groundwater Analyses – Glycols

Analytical results were screened against the applicable BCWQG (maximum and 30 day average values) as well as the CCME Aquatic Life – Freshwater (AW-F) standards.

5.4.3.1 Field and Physical Parameters

Eleven (11) surface water samples collected as part of the most recent investigation contained exceedances of physical parameters that were measured in the field, relative to the applicable BCWQG. The parameters that exceeded the applicable BCWQG included dissolved oxygen and pH.

5.4.3.2 Dissolved Metals

Nine (9) surface water samples contained exceedances of dissolved metals (not including dissolved sodium) relative to the applicable BCWQG (Figure 7). The dissolved metals that exceeded the applicable BCWQG included aluminum, cadmium, and iron.

5.4.3.3 Total Metals

Eleven (11) surface water samples analyzed as part of the most recent investigation contained exceedances of total metals (not including total sodium) relative to the applicable BCWQG (Figure 7). The total metals that exceeded the applicable BCWQG included aluminum, barium, copper, iron, lead, mercury and zinc.

5.4.3.4 Chloride Ion and Total and Dissolved Sodium

Eleven (11) surface water samples analyzed as part of the most recent investigation met the applicable BCWQG for chloride ion and total and dissolved sodium.

5.4.3.5 Petroleum Hydrocarbons, PAHs, BTEX and VPH

Eleven (11) surface water samples analyzed as part of the most recent investigation met the applicable BCWQG for petroleum hydrocarbons, PAHs, BTEX and VPH.

5.4.3.6 Volatile Organic Compounds

Seven (7) surface water samples were analyzed for VOCs as part of the most recent investigation and met the applicable BCWQG.

5.4.3.7 Glycols

Six (6) surface water samples were analyzed for glycols as part of the most recent investigation and met the applicable BCWQG.

5.4.4 Sediment Analytical Results

Nine (9) sediment samples, including one (1) field duplicate, were collected and were submitted for laboratory analyses, as described in Section 4.8.2. Analytical data are incorporated with the previous investigation data and presented in the following tables:

- Table 28 – Results of Sediment Analyses – Metals, Anions and Nutrients
- Table 29 – Results of Sediment Analyses – Petroleum Hydrocarbons and PAHs
- Table 30 – Results of Sediment Analyses – Volatile Organic Compounds

A visual display of sampling locations is shown on the following figures:

- Figure 12: Sediment Chemistry Results –Total Metals
- Figure 13: Sediment Chemistry Results – Sodium and Chloride (Saturated Paste)
- Figure 14: Sediment Chemistry Results – Petroleum Hydrocarbons, PAHs, BTEX and VPH
- Figure 15: Sediment Chemistry Results –Volatile Organic Compounds

Analytical results were screened against the applicable CSR freshwater sediment sensitive use and typical use standards as well as the CCME ISQG and PEL standards. All nine (9) sediment samples analyzed as part of the most recent investigation met the applicable freshwater sediment sensitive use and typical use standards (Figures 12 - 15).

5.5 Soil Vapour Modeling

Soil vapour quality was predicted based on partitioning calculations of soil and groundwater results at the Site. A detailed description of the modeling assumptions and partitioning results are included in Appendix J.

The modeled soil vapour results were less than applicable CSR RL vapour standards, with the two following exceptions:

- Soil vapour results modeled based on groundwater partitioning exceeded applicable CSR standards for indoor air exposure for a dwelling located within 30 m of monitoring well location K19-MW16-07S/D. K19-MW16-07S/D is located along the eastern boundary of the Site and is within 30 m of an off-Site building to the east. The vapour results are considered conservative, as groundwater results used as part of the modeling were less than laboratory detection limits.
- The predicted soil vapour concentration of benzene at monitoring well location K19A-09MW-05 exceeded the applicable CSR standards for outdoor air exposure. K19A-09MW-05 is located south of AEC 1a. The predicted based concentration is based on soil partitioning. The predicted benzene concentration is considered to be conservative, as soil concentrations used as part of the model were less than the laboratory detection limits (0.04 mg/kg for benzene) which was higher than the current CSR standard of 0.035 mg/kg.

5.6 Results of QA/QC Analyses

The methods and results of QA/QC analyses are included in Appendix K. QA/QC analyses included a review of field duplicate results and a review of laboratory QA/QC tests from the most recent investigation. The key findings of the QA/QC review are summarized below.

5.6.1 Duplicate Frequency

Duplicate frequencies are provided for soil, groundwater, surface water and sediment. The target duplicate frequency is 10% or greater.

- Duplicate frequency analysis was less than the target rate of 10% for certain parameters that were analyzed as part the soil/residual soil investigation, as shown below. However, the reduced sampling frequency is not considered to affect the overall remediation planning process:
  - Metals – 12.3%
  - Sodium and Chloride Ions – 12.8%
  - Hydrocarbons – 8.3%
  - BTEX/VPH – 11.8%
  - VOCs – 9.0%
  - Glycols – 12.5%

- Duplicate frequency analysis was less than the target rate of 10% for glycol parameters that were analyzed as part the groundwater as shown below.
  - Metals – 12%
  - Sodium and Chloride – 100%
  - Hydrocarbons – 12%
  - BTEX/VPH – 12%
  - VOCs – 18%
  - Glycols – 0%

- Duplicate frequency analysis was met the target rate of 10% for all parameters that were analyzed as part the surface water investigation, as shown below:
  - Metals – 10%
  - Sodium and Chloride – 10%
  - Hydrocarbons – 10%
  - BTEX/VPH – 10%
  - VOCs – 10%
  - Glycols – 10%

- Duplicate frequency analysis met the target rate of 10% for all parameters that were analyzed as part the sediment investigation, as shown below:
  - Metals – 11.3%
  - Sodium and Chloride Ions – 25%
  - Hydrocarbons – 25%
  - BTEX/VPH – 11.3%
  - VOCs – 25%

5.6.2 Relative Percent Difference and Difference Factor

Relative percent difference (RPD) and difference factor (DF) are provided for soil, groundwater, surface water and sediment. The target RPD and DFs are as follows:

- For parameters in soil except PAHs, a RPD of less than 35%.
- For PAH parameters in soil, a RPD of less than 50%.
- For parameters in groundwater and surface water a RPD of less than 20%.

- For parameters with concentrations less than five times the MRL, the difference factor should be less than two (2).
- RPD and DF values for selected parameters exceeded Golder's internal objectives of RPDs of 50% for PAHs, HEPH, VH and VPH; and 35% for other parameters and/or DFs of 2 in soil. The elevated RPDs and/or DFs are considered to be a result of sample heterogeneity and the results are not considered to affect the interpretation of soil quality at the Site. For the majority of the samples where an elevated RPD and/or DF value was observed, the results of both the original and duplicate samples were both above the applicable standard, or both below the applicable soil standard.
- RPD values for selected parameters exceeded Golder's internal objectives of 20% for dissolved arsnic (2 locations) and dissolved molybdenum (1 location) in groundwater. The results are not considered to affect the interpretation of groundwater quality at the Site. For the three samples where an elevated RPD value was observed, the results of both the original and duplicate samples were below the applicable groundwater standard.
- RPD and the DF values for selected parameters exceeded Golder's internal objectives of 20% and 2, respectively for parameters in surface water. The elevated RPDs and DF are not considered to affect the interpretation of surface water quality at the Site. For all the samples where an elevated RPD value was observed, the results of both the original and duplicate samples were above applicable guidelines, or below the applicable guidelines with one exception. One sample pair has a concentration of total mercury above and below the BCWQG FW 30 Day and the CCME guidelines. Several other surface water samples also had exceedances to the BCWQG FW 30 Day and the CCME guidelines for total mercury, therefore this sample pair was considered to exceed the applicable total mercury guidelines. This sample pair and all others surface water samples met the applicable dissolved mercury standards.
- RPD values for selected parameters exceeded Golder's internal objectives of 35% for metals in sediment. The elevated RPDs are considered to be a result of sample heterogeneity and the results are not considered to affect the interpretation of soil quality at the Site since the parameters with elevated RPDs did not have applicable standards and/ or guidelines.

5.6.3 Laboratory QC

No exceedances of laboratory QC tests were identified.

6.0 DISCUSSION

The sections below provide an updated or preliminary conceptual side model for APECs and AECs that were investigation as part of the July 2017 investigation program. APECs and/or AECs that were not investigated in July 2017 are not discussed in this section, as it is understood that conditions in those areas have not changed since site activities conducted in January 2017.

6.1 AEC 1a – Suspected Maintenance Garage

Previous investigation results at AEC 1a identified soil contamination of naphthalene (from 1.8 to 2.1 m bgs at one location K19-10TP-09), sodium, chloride and arsenic contamination in soil (refer to Section 6.14 for a discussion of sodium and chloride and metals). The objectives of the July 2017 investigation program were therefore to delineate the observed soil contamination.

The results of the July field program did not identify additional naphthalene exceedances in the step out samples collected from the test pit location K19-TP17-73. However, predicted soil vapour concentrations based on a conservative and indirect partitioning method identified a potential risk to outdoor air quality at monitoring well location K19A-09MW-05.

As described in the January investigation report (dated 24 March 2017), soil contamination in this location is likely related to localized fueling operations, as odours and pipes were identified in this test pit during previous investigations by Franz. This area has been delineated and the estimated extent of petroleum hydrocarbon contamination in soil is shown on Figure 17.

Although a potential outdoor air exposure risk was identified at AEC 1a, based on a conservative and indirect partitioning method, further investigation work could be performed through direct soil vapour measurement at K19A-09MW-05. Measurement of in-situ soil vapour concentrations in the vicinity of this location may indicate that soil vapour quality meets applicable standards. Alternatively, this location can be addressed through removal of suspect soils as part of remediation of hydrocarbon-contaminated soil at K19-TP17-73, which is expected in the future. Characterization of soil vapour quality is recommended following implementation of remedial works in this area.

6.2 AEC 1b – Suspected Maintenance Garage

The objectives of the investigation work in AEC 1b were to increase the soil sampling density in the southern portion of the area and to delineate observed hydrocarbon soil contamination on the west side of the former Alaska Highway alignment.

Three test pits (TP17-69, TP17-70, and TP-79) were completed at the south and southeast portion of the previously identified AEC boundary. Sample results from these test pits were less than applicable standards. The results support previous conclusions for this AEC, which identified hydrocarbon soil contamination was delineated in the southern and eastern portions of the AEC.

Four monitoring wells (two shallow and two deep), were installed on the western side of the former Alaska Highway alignment, in order to delineate previously observed hydrocarbon contamination and to characterize off-Site groundwater quality.

Based on the results of the July 2017 investigation program, soil contamination is present on the western side of the former alignment and has migrated off-Site. Hydrocarbon soil contamination, consisting of benzene and naphthalene, was identified at off-Site monitoring well locations K19-MW17-29D and K19-MW17-35D. At K19-MW17-29D, hydrocarbon soil contamination extends from approximately 2.5 m bgs to a depth of approximately 5.3 m bgs. The soil contamination is considered vertically delineated, but is not laterally delineated at this monitoring well location. At K19-MW17-35D, hydrocarbon soil contamination is considered to extend from a depth of approximately 1.0m m bgs to a depth of 7.0 m bgs. The soil contamination was not vertically nor laterally delineated at this monitoring well location.

Based on the results groundwater monitoring at K19-MW17-29 and K19-MW17-35 and data from previous investigations, hydrocarbon soil contamination at these locations as well as from within AEC 1b immediately to the east (source area) has affected groundwater quality. This interpretation is consistent with calculated groundwater flow directions, which generally indicate groundwater flow is to the northwest. Hydrocarbon-based parameters, including benzene, toluene, xylenes, LEPH, VPH(C_6-C_{10}), naphthalene and 1-methylnaphthalene, in K19MW17-29S, K19-MW17-35S, and K19-MW17-35D exceeded applicable CSR DW and/or AW standards. The groundwater plume is considered present from 3.5 m bgs to 8.0 m bgs in the vicinity of MW17-35, and extends from a depth of 3.3 to 4.8 m bgs at MW17-29. Locally-deeper groundwater at MW17-29 does not appear to have been affected by the soil contamination, as groundwater results at MW17-29D were less than applicable CSR standards. The lateral extent of groundwater contamination has not been delineated.

Arsenic, barium and zinc contamination in soil was identified due to newly lowered standards and/or regional background concentrations however these areas are slated to be addressed through remediation and/or risk assessment.

The remedial implications of the investigation results in AEC 1b are further discussed in Section 7.0, below.

6.3 AEC/APEC 1d – Berm of Debris near Suspected Maintenance Garage

One monitoring well (K19-MW17-32) was installed within AEC/APEC 1d and four hand dug samples (K19-HD17-01 to -04) were collected as part of the July 2017 investigation program. A groundwater sample was also collected from the newly-installed monitoring well and soil vapour concentrations were predicted based on the results of soil and groundwater analyses. The scope of the investigation works completed in this area of the Site is considered sufficient to have adequately characterized potential environmental impacts from the historical debris.

Arsenic, barium and iron contamination in soil was identified due to recently lowered standards (i.e. Stage 10/11 for the CSR) and/or regional background concentrations: refer to Section 6.14 for a discussion on site-wide metals.

Based on the presence of localized metal exceedances this is carried forward as AEC 1d. The scope of the investigation work conducted within AEC 1d is considered sufficient to have adequately characterized environmental media in this area of the Site. Additional investigation work is not considered necessary at this time subject to review to be carried out during the risk assessment stage focused at assessing the localized arsenic, barium and iron exceedances which are being addressed as part of overall risk management for the Site.

6.4 AEC 1e – Shallow Hydrocarbon Contamination on the Eastern Side of the Access Road

Three test pits (K19-TP17-52 -53 and -62) were advanced within AEC 1e as part of the July 2017 investigation program. The objective of the investigation work was to delineate historical soil contamination.

With the exception of localized arsenic, barium and cadmium exceedances in soil, the analytical results for soil and groundwater from the July 2017 investigation were less than applicable CSR standards. Predicted soil vapour concentrations were also less than applicable CSR standards.

Based on the presence of localized petroleum hydrocarbon and metal exceedances, this continues as AEC 1e. The scope of the investigation work conducted within AEC 1e is considered sufficient to have adequately characterized environmental media in this area of the Site. Additional investigation work is not considered necessary at this time subject to review to be carried out during the risk assessment stage focused at assessing the localized arsenic, barium and iron exceedances which are being addressed as part of overall risk management for the Site.

6.5 APEC 4 – Former Residential Area with USTs and Minor Surface Debris

Three test pits (K19-TP17-55 to -57) and one borehole completed as a monitoring well (K19-MW17-28), were advanced within APEC 4 as part of the July 2017 investigation program. The objective of the investigation work in APEC 4 was to provide a preliminary characterization of soil and groundwater quality in the vicinity of the suspect former UST(s).

With the exception of localized arsenic (1) and barium (2) exceedances in soil, the analytical results for soil and groundwater from the July 2017 investigation were less than applicable CSR standards. Predicted soil vapour concentrations were also less than applicable CSR standards.

Based on the presence of arsenic and barium metal exceedances this APEC is carried forward as AEC 28 (refer to Section 6.14). The scope of the investigation work conducted is considered sufficient to have adequately characterized environmental media in this area of the Site. Additional investigation work is not considered necessary at this time subject to review to be carried out during the risk assessment stage focused at assessing the localized arsenic and barium exceedances which are being addressed as part of overall risk management for the Site.

6.6 APEC 5 – Potentially Buried Debris

One borehole, completed as a monitoring well (K19-MW17-18), was advanced in the inferred hydraulic downgradient direction of APEC 5 and APEC 24 as part of the July 2017 investigation program. The objective of the investigation work in APEC 5 was to determine whether potentially buried debris may have affected soil and/or groundwater quality.

With the exception of localized arsenic (1), cadmium (1) and zinc (1) exceedances in soil, the analytical results for soil and groundwater from the July 2017 investigation were less than applicable CSR standards. Predicted soil vapour concentrations were also less than applicable CSR standards.

Based on the presence of localized arsenic, cadmium and zinc metal exceedances this APEC is carried forward as AEC 24 (refer to Section 6.13). The scope of the investigation work conducted is considered sufficient to have adequately characterized environmental media in this area of the Site. Additional investigation work is not considered necessary at this time subject to review to be carried out during the risk assessment stage focused at assessing the localized arsenic and barium exceedances which are being addressed as part of overall risk management for the Site.

6.7 APEC 6 – Surface Area Debris

One borehole, completed as a monitoring well (K19-MW17-20), and three hand dug samples (HD17-05 to -07) were advanced within APEC 6 as part of the July 2017 investigation program. The objective of the investigation work in APEC 6 was to determine whether potentially buried debris may have affected soil and/or groundwater quality.

Apart from a shallow arsenic and zinc exceedance at K19-HD17-06, the analytical soil and groundwater results from the July 2017 investigation were less than applicable CSR standards. Predicted soil vapour concentrations were also less than applicable CSR standards.

Based on the presence of a localized metal exceedances this APEC is carried forward as an AEC 24 (refer to section 6.13). The area of was adjusted to also include another nearby arsenic, cadmium and zinc exceedance at K19-MW17-18 (APEC 5 and APEC/AEC 24). The scope of the investigation work conducted within AEC 5 is considered sufficient to have adequately characterized environmental media in this area of the Site. Additional investigation work is not considered necessary at this time subject to review to be carried out during the risk assessment stage focused at assessing the zinc exceedances which are being addressed as part of overall risk management for the Site.

6.8 APEC 9 – Surface Area Debris Including 200L Drum

APEC 9 is located in a forested area in the southwest portion of the Site. During a site walkover conducted in June 2016, surface debris, including a 200 L drum, was observed. This area was retained for preliminary characterization of soil quality to evaluate potential impacts from the observed material.

Two hand auger locations (K19-HA17-09 and K19-HA17-10) were completed in APEC 9 as part of the 2017 investigation. Soil analytical results were less than applicable CSR soil standards for metal, hydrocarbon and VOC parameters. The soil vapour concentrations that were predicted based on soil analytical results were also less than applicable CSR standards.

The extent of investigation work conducted in APEC 9 is considered sufficient to have adequately characterized this area of the Site. Further investigation work is not considered necessary at this time.

6.9 APEC 10a – Rebar and 200L Drum

APEC 10a is located in a forested area in the northeast portion of the Site. During a site walkover conducted in June 2016, a 200 L drum and metal debris (rebar) were observed on the ground surface. This area was retained for preliminary characterization of soil quality.

One hand auger location (K19-HA17-08) was completed in APEC 10a July 2017 investigation. Apart from a near surface barium exceedance, soil analytical results were less than applicable CSR soil standards. The soil vapour concentrations that were predicted based on soil analytical results were also less than applicable CSR standards.

Based on the presence of a localized metal exceedance, this APEC is carried forward as AEC 28 (Site wide metals). The extent of investigation work conducted in AEC 10a is considered sufficient to have adequately characterized this area of the Site. Additional investigation work is not considered necessary at this time subject to review to be carried out during the risk assessment stage focused at assessing the barium exceedance which is being addressed as part of overall risk management for the Site.

6.10 APEC 10b – Partially Exposed Metal Pipe

APEC 10b is also located in a forested area in the northeast portion of the Site, to the west of APEC 10a. During a site walkover conducted in June 2016, a metal pipe protruding from the ground surface was observed. The depth or extent the metal pipe within the subsurface was not confirmed during the Site visit, and the area was therefore retained as an APEC.

One hand auger location (K19-HA17-06) was completed in APEC 10b as part of the July 2017 investigation in order to provide a preliminary characterization of soil quality. Apart from a near surface barium exceedance, soil analytical results were less than applicable CSR soil standards. The soil vapour concentrations that were predicted based on soil analytical results were also less than applicable CSR standards.

Based on the presence of a localized metal exceedance, this APEC is carried forward as AEC 28 (Site wide metals). The extent of investigation work conducted in AEC 10b is considered sufficient to have adequately characterized this area of the Site. Additional investigation work is not considered necessary at this time subject to review to be carried out during the risk assessment stage focused at assessing the barium exceedance which is being addressed as part of overall risk management for the Site.

6.11 APEC 11 – Surface Area Debris Including AST, Abandoned Fuel Pumps and 200L Drums

APEC 11 is located along the southern boundary of the Site, and was identified during the Site walkover conducted in June 2016. Two test pits (K19-TP17-77 and -78) and one borehole (K19-MW17-31), completed as a monitoring well, were completed in APEC 11 as part of the July 2017 investigation program.

With the exception of near surface arsenic, barium, manganese and nickel exceedances at one location, and near surface arsenic at two other locations, the results of soil and groundwater samples analyzed in APEC 11, as well as predicted soil vapour concentrations, were less than applicable CSR standards. Based on the presence of a localized metal exceedances, this APEC is carried forward as AEC 11.

The extent of investigation work conducted in APEC 11 is considered sufficient to have adequately characterized this area of the Site. Additional investigation work is not considered necessary at this time subject to review to be carried out during the risk assessment stage, focused at assessing the metal exceedances which are being addressed as part of overall risk management for the Site.

6.12 APEC 12 – Surface Area Debris Including 200L Drums, Abandoned Residential Structure, and Vehicle Parts

APEC 12 is located on the southern boundary of the Site. Three (3) test pits (K19-TP17-74, -75, and -76) and one monitoring well (K19-MW17-31) were completed as part of the July 2017 investigation to assess soil and groundwater quality.

With the exception of arsenic exceedances at three locations and one barium exceedance at one location, the results of soil and groundwater samples analyzed in APEC 12, as well as predicted soil vapour concentrations, were less than applicable CSR standards.

Based on the presence of arsenic and barium exceedance, this APEC is carried forward as AEC 28 (Site wide metals). The extent of investigation work conducted in AEC 12 is considered sufficient to have adequately characterized this area of the Site. Additional investigation work is not considered necessary at this time subject to review to be carried out during the risk assessment stage focused at assessing the barium exceedance which is being addressed as part of overall risk management for the Site.

6.13 APEC 13 to APEC 27 – Inferred Industrial and non-Industrial Buildings on 1951 Gator Map

Fifteen (15) APECs were identified following a review of a Gator map produced in 1951. The APECs (13 through 27) are present across the Site (refer to Figure 2) and, based on the review of the historical map, are inferred to have consisted of industrial and non-industrial buildings, some with vehicle access. These APECs were the primary focus for the July 2017 investigation program.

Sixteen (16) test pits and twelve (12) monitoring wells were completed in these APECs. In addition, soil vapour modeling was conducted at each of the APECs, in order to predict air quality based on soil and groundwater results. The scope of the investigation is considered sufficient to have adequately characterized the quality of environmental media at each of the APECs.

The analytical soil and groundwater results, as well as predicted air quality concentrations, meet applicable standards, with the following exceptions:

APEC 13

Nine (9) test pits were completed as part of the July 2017 investigation to assess soil quality. With the exception of arsenic and/ or barium exceedances in eight soil samples at seven locations and dissolved cobalt at one downgradient monitoring well location (K19-MW16-11), the results of soil and groundwater samples analyzed in APEC 13, as well as predicted soil vapour concentrations, were less than applicable CSR standards.

Based on the presence of arsenic and barium in soil and cobalt in groundwater exceedances, this APEC is carried forward as AEC 28 (Site wide metals). The extent of investigation work conducted in AEC 13 is considered sufficient to have adequately characterized this area of the Site. Additional investigation work is not considered necessary at this time subject to review to be carried out during the risk assessment stage focused at assessing the barium exceedance which is being addressed as part of overall risk management for the Site.

APEC 14

One monitoring well (K19-MW17-33) was completed in the inferred hydraulic down-gradient direction of APEC 14 as part of the July 2017 investigation to assess soil and groundwater quality. With the exception of an arsenic exceedance in soil and a dissolved cobalt exceedance in groundwater, the results of soil and groundwater samples analyzed in APEC 14, as well as predicted soil vapour concentrations, were less than applicable CSR standards.

Based on the presence of the arsenic in soil and cobalt in groundwater exceedances, this APEC is carried forward as AEC 28 (Site wide metals). The extent of investigation work conducted in APEC 14 is considered sufficient to have adequately characterized this area of the Site. Additional investigation work is not considered necessary at this time subject to review to be carried out during the risk assessment stage focused at assessing the barium exceedance which is being addressed as part of overall risk management for the Site.

APEC 15

One monitoring well (K19-MW17-34) was completed in the inferred hydraulic down-gradient direction of APEC 15 as part of the July 2017 investigation to assess soil and groundwater quality. With the exception of an arsenic exceedance, the results of soil and groundwater samples analyzed in APEC 15, as well as predicted soil vapour concentrations, were less than applicable CSR standards.

Based on the presence of the arsenic exceedance, this APEC is carried forward as AEC 28 (Site wide metals). The extent of investigation work conducted in APEC 15 is considered sufficient to have adequately characterized this area of the Site. Additional investigation work is not considered necessary at this time subject to review to be carried out during the risk assessment stage focused at assessing the barium exceedance which is being addressed as part of overall risk management for the Site.

APEC 16

One monitoring well (K19-MW17-25) was completed in the inferred hydraulic down-gradient direction of APEC 16, and one test pit was completed in the APEC (K19-TP17-67) as part of the July 2017 investigation to assess soil and groundwater quality. With the exception of an arsenic and barium exceedance at one location, the results of soil and groundwater samples analyzed in APEC 16, as well as predicted soil vapour concentrations, were less than applicable CSR standards.

Based on the presence of the arsenic exceedance, this APEC is carried forward as AEC 28 (Site wide metals). The extent of investigation work conducted in APEC 16 is considered sufficient to have adequately characterized this area of the Site. Additional investigation work is not considered necessary at this time subject to review to be carried out during the risk assessment stage focused at assessing the barium exceedance which is being addressed as part of overall risk management for the Site.

APEC 17

One monitoring well (K19-MW17-24) was completed in the inferred hydraulic down-gradient direction of APEC 17, and two test pits were completed in the APEC (K19-TP17-64 and -66) as part of the July 2017 investigation to assess soil and groundwater quality. With the exception of an arsenic in soil exceedance at one location, and a barium in groundwater exceedance at K19-MW17-24, the results of soil and groundwater samples analyzed in APEC 17, as well as predicted soil vapour concentrations, were less than applicable CSR standards.

Based on the presence of the arsenic exceedance, this APEC is carried forward as AEC 28 (Site wide metals). The extent of investigation work conducted in APEC 17 is considered sufficient to have adequately characterized this area of the Site. Additional investigation work is not considered necessary at this time subject to review to be carried out during the risk assessment stage focused at assessing the barium exceedance which is being addressed as part of overall risk management for the Site.

APEC 18

One monitoring well (K19-MW17-23) was completed in the inferred hydraulic down-gradient direction of APEC 17, and two test pits were completed in the APEC (K19-TP17-46 and -47) as part of the July 2017 investigation to assess soil and groundwater quality. With the exception of an arsenic in sol exceedance at one location, and a barium in groundwater exceedance at K19-MW17-23, the results of soil and groundwater samples analyzed in APEC 18, as well as predicted soil vapour concentrations, were less than applicable CSR standards.

Based on the presence of the arsenic in soil and barium in groundwater exceedances, this APEC is carried forward as AEC 28 (Site wide metals). The extent of investigation work conducted in APEC 18 is considered sufficient to have adequately characterized this area of the Site. Additional investigation work is not considered necessary at this time subject to review to be carried out during the risk assessment stage focused at assessing the barium exceedance which is being addressed as part of overall risk management for the Site.

APEC 19

Toluene soil concentrations at K19-MW17-26 exceeded applicable CSR IL standards at a depth of 8.0 to 8.8 m bgs (within bedrock). The soil contamination is considered to be vertically delineated at a depth of 11.0 m bgs, but has not been laterally delineated. The results of a groundwater sample collected from the monitoring well indicate that the soil contamination has not affected groundwater quality in this area of the Site, as groundwater concentrations were less than applicable CSR AW and DW standards.

Based on the presence of the deeper toluene exceedances, this APEC is carried forward as AEC 19b in order to distinguish it from the nearby AEC 19a (shallow hydrocarbon contamination). The soil contamination observed at K19-MW17-26 is inferred to be associated with the historical structures that were located in this area of the Site.

While the current remedial plan targets remediation of bedrock contamination as part of an overall risk based risk management for the Site, AEC 19a is retained for further investigation to identify the source of the deeper contamination given that at K19-MW17-26 and nearby test pits no shallow hydrocarbon contamination was identified.

APEC 20

One monitoring well (K19-MW17-27) was completed in the inferred hydraulic down-gradient direction of APEC 20, as part of the July 2017 investigation to assess soil and groundwater quality. With the exception of arsenic exceedance at one historical location (K19-TP17-23), the results of soil and groundwater samples analyzed in APEC 20, as well as predicted soil vapour concentrations, were less than applicable CSR standards.

Based on the presence of the arsenic exceedance, this APEC is carried forward as AEC 28 (Site wide metals). The extent of investigation work conducted in APEC 20 is considered sufficient to have adequately characterized this area of the Site. Additional investigation work is not considered necessary at this time subject to review to be carried out during the risk assessment stage focused at assessing the barium exceedance which is being addressed as part of overall risk management for the Site.

APEC/AEC 24

One monitoring well (K19-MW17-28) was completed in the inferred hydraulic down-gradient direction of APEC 24 and APEC 5, as part of the July 2017 investigation to assess soil and groundwater quality. This APEC was combined with APECs 5 and (Section 6.6 and 6.7) and was already carried forward as AEC 24.

APEC 25

Arsenic and zinc concentrations at K19-TP17-41 and K19-TP17-42, respectively, exceeded the applicable CSR WL_R between 1.6 and 2.6 m bgs. Apart from lithium (refer to Section 6.14.1, below), the results of a groundwater sample collected from the monitoring well indicate that the soil contamination has not affected groundwater quality in this area of the Site, as groundwater concentrations were less than applicable CSR AW and DW standards.

Based on the presence of the metal contamination, this APEC is carried forward as AEC 25. The soil contamination is inferred to be associated with the historical structures that were located in this area of the Site.

The extent of investigation work conducted in AEC 25 is considered sufficient to have adequately characterized this area of the Site. Additional investigation work is not considered necessary at this time subject to review to be carried out during the risk assessment stage focused at assessing the metal exceedances which are being addressed as part of the overall risk management for the Site.

6.14 AEC 28 – Site-Wide Metals and AEC 29 – Site-Wide Storage and Handling of Salt

For the purpose of remediation planning it has been assumed that contamination at the Site related to metals and salt impacts in soil and groundwater can be addressed through risk assessment (Golder 2016d). A summary of the metals and salt related contamination identified at the Site to date is provided below.

6.14.1 AEC 28 – Site-Wide Metals

Metals in Soil

The results of metals analyses conducted as part of the July 2017 investigation program were generally consistent with results observed during previous investigations at the Site (refer to Figure 3)

The metals that exceeded the applicable CSR WL_R and/or IL standards comprise arsenic, barium, beryllium, cadmium, cobalt, iron, manganese, nickel, selenium and zinc. Of these metals, arsenic and barium are observed to be the most widespread across the Site. The locations of the arsenic and barium samples with elevated concentrations occur across the Site, and are at relatively similar concentrations, suggesting that arsenic and barium in soil can likely be attributed to background soil conditions. All of the arsenic exceedances and numerous barium exceedances are a result of the recently revised Protocol 4 background concentrations (which were lowered for several metals in the Peace Region). A significant number of locations identified with metal exceedances have either been remediated as part of the 2017/2018 remediation of hydrocarbon impacted soils at AEC 1b and AEC 1c, or are anticipated to be removed as part of remediation of hydrocarbon impacted soils at AECs 2a and 2b.

Other metals identified in soil at the Site are observed in more localised areas and within the top 3 m of soil. Concentrations of these metals in soil are generally observed to be less than two times the applicable CSR WL_R and/or IL standards and do not suggest the presence of significantly high levels of metals contamination at the Site. Some of these metal exceedance locations correspond with previously known APECs that are now classified as AECs to account for the metals (AEC 1d, 5, 11, and 25). The other localized exceedances have occurred outside known APECs and will be evaluated as part of risk assessment in accordance with the 2016 Revised RAP/RMP (Golder 2016d).

Metals-contaminated soil is not considered to be fully delineated across the Site, however the current sampling density for these parameters is considered sufficient to undertake a risk assessment. Additional shallow soil sampling may be required to once risk assessment work is commenced.

Metals in Groundwater

Dissolved metals results for samples collected as part of the July 2017 investigation program were generally consistent with previous investigation results. Throughout the various stages of investigation work at the Site, dissolved metals parameters that have been reported for one or more monitoring wells at concentrations above the applicable CSR DW and/or AW standards include:

- Arsenic (two locations)
- Barium (35 locations)
- Cobalt (44 locations)
- Lead (one location)
- Lithium (88 locations)
- Nickel (three locations)
- Selenium (two locations)
- Thallium (one location)
- Uranium (one location)
- Zinc (two locations)

The July 2017 groundwater results for dissolved metals have not changed the current understanding of groundwater quality at the Site. Locations with arsenic, lead, nickel, selenium thallium, uranium and zinc exceedances have been delineated and occur within or close proximity of areas that have been remediated or will be remediated that are associated with hydrocarbon impacted soils. The dissolved metals contamination in groundwater may reflect Site activities and/or in the case of barium, cobalt, and thallium may be attributed to background groundwater conditions. Off-site delineation for dissolved metals has not occurred.

The current groundwater data set for dissolved metals is considered sufficient to undertake the preliminary stages of a risk assessment. Additional groundwater investigation, including assessment of background groundwater quality and/or delineation, may be required to support completion of a detailed risk assessment for the Site.

6.14.2 AEC 29a, AEC 29b and AEC 29c – Site-Wide Storage and Handling of Salt

Sodium and Chloride Ions in Soil and Groundwater

The results of previous investigation work identified sodium and chloride contamination in two areas of the Site: near AEC 1a (where the former salt pile is understood to have been located), and in the vicinity of APEC 23 (near AEC 23a and 23b. Investigation work relating to sodium and chloride that was conducted in July 2017 focused on these two areas of the Site. Based on findings of the July 2017, the AECs associated with salt have now been reclassified as AEC 29a, 29b and 29c.

AEC 29a

In the vicinity of AEC 1a, sodium and/chloride contamination was previously identified at a depth of up to 3.5 m bgs, however the highest concentrations were generally observed in the upper 1 m of soil. Based on these findings, samples collected as part of the July 2017 investigation program were generally collected with a hand auger (K19-HA17-01 to -05) for lateral delineation purposes. The samples were collected in order to delineate salt-related impacts in soil and to support completion of a risk assessment for these parameters.

Based on the results of the July 2017 investigation program, salt-contamination is considered delineated to the south, west, and east of K19-TP17-03, -08, and -05. The salt contamination in the soil is not fully delineated to the north of K19-HA17-04. Additional, surficial soil samples are recommended in this area in order to support the risk assessment for the Site.

Historical salt storage appears to have affected groundwater quality in this area of the Site, as sodium and/or chloride exceedances were observed at four monitoring well locations over the course of investigation programs: K19A-09MW-02, K19-09MW-04, K19-09MW-06, and K19-MW16-03S. Exceedances of the CSR AW standard for chloride were observed as recently as during the July 2017 investigation. Groundwater delineation has been broadly completed with the exception of the northwestern edge of the plume.

AEC 29b

The second area of salt-related soil contamination (location K19-TP17-09 and -19, in the vicinity of AEC 23) appeared to correlate to an area of high conductivity identified during the 2016 geophysical investigation (Golder 2016a). Concentrations of sodium and chloride in this area of the Site were observed to be lower than those identified at AEC 29a.

Based on the results of the July 2017 investigation program, sodium and chloride contamination in soil in this area of the Site is considered well delineated apart from the delineation to the south east that is considered currently to have been broadly delineated. Additional soil samples are recommended to the south and east of K19-TP17-19 in order to refine the extent of salt contamination and to delineate the eastern extent of the exceedances.

Similar to AEC 29a, a sodium and chloride plume is present in groundwater Delineation of the groundwater plume has been achieved to the north, south and east while the plume to the west (in the approximate direction of groundwater flow) has been broadly delineated. Additional groundwater delineation to the west will assist in refining the westerly extent of the plume.

AEC 29c

The third area of salt contamination at the Site is within AEC 2b, in the central area of the Site. Historical salt storage does not appear to have affected soil quality in this area, as sodium and chloride concentrations in soil were less than applicable standards. However, salt parameters appear to have leached into groundwater, as sodium concentrations at K19-MW16-09 were above the CSR DW standard on two sampling events. The groundwater contamination in this area of the Site is considered to be isolated and delineated.

6.15 Summary of APECs and AECs

Table 10, below provides a detailed summary of each of the APECs and AECs identified at the Site and provides comments on the future work planned for each APEC and AEC. For completeness, Table 10 includes APECs and AECs that were not investigated as part of the July 2017 investigation program. The locations of APECs and AECs are detailed on Figure 17.

Table 10: Summary of Status of APECs and AECs

APEC / AEC	Description	Contamination Identified to date[1]	Status
AEC 1 a (3)	Suspected Maintenance Garage	**Soil:** salt related parameters (i.e., sodium and chloride) and petroleum hydrocarbon related parameters **Groundwater:** metals, salt related parameters	Carried forward for remediation of hydrocarbon contamination and risk assessment for salt related contamination (AEC 29). Area for hydrocarbon remediation is delineated.
AEC 1b	Suspected Maintenance Garage	**Soil:** metals (arsenic, barium, zinc), petroleum hydrocarbon related parameters, VOCs **Groundwater:** metals, salt related parameters, petroleum hydrocarbon related parameters (2)	Carried forward for remediation and risk assessment. Area for hydrocarbon remediation is partially delineated. Hydrocarbon contamination in soil and groundwater extends to the former alignment. Off-Site delineation has not been completed.
AEC 1c	Suspected Maintenance Garage	**Soil:** metals (arsenic, barium, nickel, selenium) petroleum hydrocarbon related parameters **Groundwater:** metals, petroleum hydrocarbon related parameters	Carried forward for remediation and risk assessment. Area for hydrocarbon remediation is delineated.

APEC / AEC	Description	Contamination Identified to date[1]	Status
AEC/ APEC 1d	Berm of debris (100 m long) near Suspected Maintenance Garage	**Soil:** metals (arsenic, barium and iron) **Groundwater:** metals (lithium[4])	Carried forward as AEC 1d. Metals to be addressed through site wide risk-based evaluation (further detailed below).
AEC 1e	Shallow hydrocarbon contamination on the eastern side of the access road	**Soil:** Metals (arsenic, barium, cadmium), petroleum hydrocarbon related parameters	Carried forward for remediation and risk assessment
AEC 2a	Suspected Maintenance Garage	**Soil:** metals (arsenic, barium, beryllium), petroleum hydrocarbon related parameters **Groundwater:** metals (barium), salt related parameters (2)	Carried forward for remediation and risk assessment. Area for hydrocarbon remediation is delineated.
AEC 2b	Suspected Maintenance Garage	**Soil:** metals (barium), petroleum hydrocarbon related parameters **Groundwater:** metals (barium, cobalt), salt related parameters	Carried forward for remediation and risk assessment. Area for hydrocarbon remediation is delineated.
AEC/ APEC 3a (3)	Former residential area with ASTs, minor surface debris	**Groundwater:** metals (cobalt)	Carried forward as AEC 28. Metals to be addressed through site wide risk-based evaluation (further detailed below).
AEC/ APEC 3b (3)	Former residential area with ASTs, minor surface debris	**Groundwater:** metals (cobalt)	Carried forward as AEC 28. Metals to be addressed through site wide risk-based evaluation (further detailed below).
APEC 4	Former residential area with USTs, and minor surface debris	**Soil:** metals (arsenic, barium) **Groundwater:** metals (lithium)	Carried forward as AEC 28. Metals to be addressed through site wide risk-based evaluation (further detailed below).
APEC 5	Potentially Buried Debris	**Soil:** metals (arsenic, cadmium, and zinc) **Groundwater:** metals (lithium)	Carried forward as AEC 24. Metals to be addressed through site wide risk-based evaluation (further detailed below).
APEC 6	Surface Area Debris	**Soil:** metals (arsenic, zinc) **Groundwater:** metals (lithium)	Area combined with AEC 5 and carried forward as AEC 24. Metals to be addressed through site wide risk-based evaluation (further detailed below).
APEC 7a	Potentially Buried Debris (including Car Parts)	Area addressed with AEC 23a	Area addressed with AEC 23a
APEC 7b	Surface Area Debris	**Groundwater:** Metals (barium and cobalt)	Carried forward as AEC 28. Metals to be addressed through site wide risk-based evaluation (further detailed below).
APEC 8	Potentially Buried Debris	None	Retired as an APEC. APEC not retained for further investigation

APEC / AEC	Description	Contamination Identified to date[1]	Status
APEC 9	Surface Area Debris including 200-L Drum	None	Retired as an APEC. APEC not retained for further investigation
APEC 10a	Rebar and 200-L Drum	**Soil:** Metals (barium)	Carried forward as AEC 28. Metals to be addressed through site wide risk-based evaluation (further detailed below).
APEC 10b	Partially Exposed Metal Pipe	**Soil:** Metals (barium)	Carried forward as AEC 28. Metals to be addressed through site wide risk-based evaluation (further detailed below).
APEC/AEC 11	Surface Area Debris including AST, Abandoned Fuel Pumps, and 200-L Drums	**Soil:** metals (arsenic, barium, manganese, zinc) **Groundwater:** metals (lithium)	Carried forward as AEC 11 for metals in soil (manganese and zinc), carried forward as AEC 28 for groundwater. Both to be addressed through site wide risk-based evaluation (further detailed below).
APEC/AEC 12	Surface Area Debris including 200-L Drums, Abandoned Residential Structure, and vehicle parts	**Soil:** metals (barium) **Groundwater:** metals (lithium)	Carried forward as AEC 28. Metals to be addressed through site wide risk-based evaluation (further detailed below).
APEC/AEC 13	Inferred non-industrial buildings on 1951 Gator map (i.e., small buildings without vehicle access)	**Soil:** metals (barium) **Groundwater:** metals (barium)	Carried forward as AEC 28. Metals to be addressed through site wide risk-based evaluation (further detailed below).
APEC 14	Inferred industrial buildings on 1951 Gator map (i.e., large buildings with vehicle access)	**Soil:** metals (arsenic) **Groundwater:** metals (cobalt)	Carried forward as AEC 28. Metals to be addressed through site wide risk-based evaluation (further detailed below).
APEC 15	Inferred industrial building on 1951 Gator map (i.e., large buildings with vehicle access)	**Soil:** metals (arsenic, barium) **Groundwater:** metals (lithium)	Carried forward as AEC 28. Metals to be addressed through site wide risk-based evaluation (further detailed below).
APEC 16	Inferred non-industrial buildings on 1951 Gator map (i.e., small buildings without vehicle access)	**Soil:** metals (arsenic, barium) **Groundwater:** metals (lithium)	Carried forward as AEC 28. Metals to be addressed through site wide risk-based evaluation (further detailed below).
APEC 17	Inferred industrial buildings on 1951 Gator map (i.e., large buildings with vehicle access)	**Soil:** metals (arsenic) **Groundwater:** metals (barium)	Carried forward as AEC 28. Metals to be addressed through site wide risk-based evaluation (further detailed below).
APEC 18	Inferred non-industrial buildings on 1951 Gator map (i.e., small buildings without vehicle access)	**Soil:** metals (arsenic) **Groundwater:** metals (barium)	Carried forward as AEC 28. Metals to be addressed through site wide risk-based evaluation (further detailed below).

APEC / AEC	Description	Contamination Identified to date[1]	Status
APEC/AEC 19	Inferred industrial buildings on 1951 Gator map (i.e., large buildings with vehicle access)	**Soil:** metals (arsenic, barium, cobalt) and petroleum hydrocarbon contamination **Groundwater:** metals (cobalt)	Carried forward as AEC 19a and 19b and is carried forward for remediation and risk assessment. Area for hydrocarbon remediation at AEC 19b is not delineated.
APEC 20	Inferred non-industrial buildings on 1951 Gator map (i.e., small buildings without vehicle access)	**Soil:** metals (arsenic) **Groundwater:** metals (lithium)	Carried forward as AEC 28. Metals to be addressed through site wide risk-based evaluation (further detailed below).
APEC 21	Inferred industrial buildings on 1951 Gator map (i.e., large buildings with vehicle access)	**Groundwater:** metals (lithium)	Carried forward as AEC 28. Metals to be addressed through site wide risk-based evaluation (further detailed below).
AEC 23a	Inferred industrial buildings on 1951 Gator map (i.e., large buildings with vehicle access)	**Soil:** metals (arsenic), petroleum hydrocarbon related parameters **Groundwater:** metals (barium, cobalt), salt related parameters	Carried forward for remediation and risk assessment. Area for hydrocarbon remediation is generally delineated.
AEC 23b	Inferred industrial buildings on 1951 Gator map (i.e., large buildings with vehicle access)	**Soil:** petroleum hydrocarbon related parameters	Carried forward for remediation (surficial contamination). Step out sampling required to confirm lateral extent fully.
APEC/ AEC 24	Inferred industrial buildings on 1951 Gator map (i.e., large buildings with vehicle access)	**Soil:** metals (arsenic, cadmium and zinc), **Groundwater:** metals (cobalt)	Carried forward as AEC 24 for metals in soil (cadmium and zinc), carried forward as AEC 28 for groundwater and arsenic in soil. To be addressed through site wide risk-based evaluation (further detailed below).
APEC 25	Inferred non-industrial buildings on 1951 Gator map (i.e., small buildings without vehicle access)	**Soil:** metals (arsenic, zinc) **Groundwater:** metals (zinc)	Carried forward as AEC 25 for zinc in soil. Carried forward as AEC 28 for groundwater. Metals will be addressed through site wide risk-based evaluation (further detailed below).
APEC 26	Inferred industrial buildings on 1951 Gator map (i.e., large buildings with vehicle access)	**Groundwater:** metals (barium, cobalt)	Carried forward as AEC 28. Metals to be addressed through site wide risk-based evaluation (further detailed below).
APEC 27	Inferred non-industrial buildings on 1951 Gator map (i.e., small buildings without vehicle access)	**Groundwater:** metals (lithium)	Carried forward as AEC28. Metals to be addressed through site wide risk-based evaluation (further detailed below).

APEC / AEC	Description	Contamination Identified to date[1]	Status
AEC 28	Site-wide Metals	**Soil:** metals **Groundwater:** metals	Carried forward for risk-assessment. Related to widespread exceedances of arsenic and barium in soil and dissolved barium, cobalt and lithium exceedances across the Site. Further interpretation and investigation may be required to determine which metals are associated with background concentrations and which are anthropogenic in nature.
AEC 29 a, b and c	Site-Wide Storage and Handling of Salt	**Soil:** sodium and chloride ions **Groundwater:** salt related parameters	Carried forward for risk-assessment. Generally delineated. Further localized refinement of extent of contamination may be required.

Notes:

1) For a more detailed discussion on Site contaminant of concern and potential contaminants of concern, please refer to the SAP (Golder 2017a) and RAP documents (Golder 2016d) and/or the sections below.
2) AEC was defined by Franz / Arcadis under the federal Regulatory Regime. Based on existing data these areas are considered APECs rather than AECs.
3) Note that PAHs were also detected in the historical drinking water well located in this area. Given the condition of the historical well (i.e., no cover, large diameter) samples from this well are not considered representative of groundwater conditions in this APEC. Further investigation of groundwater in this area was completed and exceedances to hydrocarbon related parameters were not observed.
4) Dissolved lithium exceeds at all APECs/ AECs that were tested for groundwater and it is listed only at APECs/ AECs in which lithium is the sole groundwater parameter that exceeds the applicable standards.

6.15.1 Predicted Soil Vapour Exceedances

There were two predicted soil vapour exceedances:

1) Soil vapour results modeled based on groundwater partitioning exceeded applicable CSR standards for indoor air exposure for a dwelling located within 30 m of monitoring well location K19-MW16-07S/D and not in an APEC/AEC. K19-MW16-07S/D is located along the eastern boundary of the Site and is within 30 m of an off-Site building to the east. The vapour results are considered conservative, as groundwater results used as part of the modeling were less than laboratory detection limits.

2) The predicted soil vapour concentration of benzene at monitoring well location K19A-09MW-05 exceeded the applicable CSR standards for outdoor air exposure. K19A-09MW-05 is located south of AEC 1a. The predicted based concentration is based on soil partitioning. The predicted benzene concentration is considered to be conservative, as soil concentrations used as part of the model were less than the laboratory detection limits (0.04 mg/kg for benzene) which was higher than the current CSR standard of 0.035 mg/kg.

To evaluate the above findings more rigorously for management decisions, it will be necessary to conduct more direct measurement of soil vapour at these two locations. Installation of one soil vapour probe in the vicinity of both K19-MW16-07S/D and K19A-09MW-05 is recommended to confirm or refute this modelled soil vapour exceedances.

7.0 NATURE AND EXTENT OF PETROLEUM HYDROCARBON CONTAMINATION

The sections below present the current understanding of the AECs the Site where petroleum hydrocarbon contamination has been identified, based on the results of the July 2017 investigation program. For areas where remediation is planned, an updated estimated extent of petroleum hydrocarbon contamination is also presented below and shown on Figures 17.

Based on the work conducted up to January 2017, the following AECs were identified to have petroleum hydrocarbon contamination:

- AEC 1a
- AEC 1b
- AEC 1c
- AEC 1e
- AEC 2a
- AEC 2b
- AEC 19
- AEC 23a
- AEC 23b

Of the nine AECs listed above, four were retained for further investigation as part of the July 2017 investigation program: AEC 1a, AEC 1b, AEC 19, and AEC 23a.

The purpose of investigation work at these AECs was to further delineate previously-identified hydrocarbon soil contamination and to support remedial planning for Fiscal Year 2017/18 and 2018/2019. The nature and extent of hydrocarbon contamination at these AECs, current to the end of July 2017 investigation work, is described in the following sections.

AECs with known hydrocarbon-contamination, that were not assessed during the July 2017 investigation program (i.e., AEC 1c, AEC 2a, AEC 2b, and AEC 23b), are not discussed further in this section of the report, as the conceptual understanding of these areas has not changed since the January 2017 investigation program. These AECs are, however, included on Table 11, below, for overall remediation planning purposes.

7.1 AEC 1a – Suspected Maintenance Garage

The findings of the January 2017 investigation program in AEC 1a identified soil contamination of naphthalene from 1.8 to 2.1 m bgs at one location (K19-10TP-09). At the conclusion of the investigation program, soil contamination was considered to be delineated, however one additional test pit was completed during the July 2017 investigation in order to increase the sampling density at this AEC. The results of the July 2017 investigation program have not changed the overall understanding of soil conditions at AEC 1a, and further investigation is not considered necessary prior to implementation of remediation activities.

7.2 AEC 1b – Suspected Maintenance Garage

At the conclusion of Site investigation activities conducted to January 2017, approximately 17,000 m^3 of hydrocarbon-contaminated soil was estimated for remedial excavation within AEC 1b. This estimate was based on contaminated soil delineated within the Site boundaries and did not include contaminated soil off-Site, both under and on the west side of the former Alaska Highway alignment. Hydrocarbon-contaminated soil within AEC 1b was identified to a depth of approximately 8.6 m bgs and was characterized by exceedances of BTEX, VPH, LEPH, naphthalene, and VOCs. Investigation work conducted to January 2017 was sufficient to delineate the southern, eastern, and northern extents of contaminated soil on-Site, but did not delineate the off-Site extent of contaminated soil. Additional investigation work was therefore conducted in July 2017 to delineate the off-Site (i.e., western) extent of contamination.

The results of the July 2017 investigation indicated that off-Site migration of contamination has occurred to the west. As previously discussed in Section 6.2, the investigation work conducted in July 2017 did not delineate the western extent of contaminated soil. Based on the investigations that have been completed at AEC 1b, an updated estimated extent of petroleum hydrocarbon contamination in soil is shown on Figure 17. Although the extent of contamination on the western side of the former alignment remains unknown, at least approximately 2,500 cubic metres of contaminated soil is considered to be present beneath the former alignment. This volume of soil has been added to the overall volume of soil proposed for remediation, as shown on Table 11, below. It should be noted that the volume of impacted soil should be revised as further delineation to the west is carried out.

7.3 AEC 1e - Shallow Hydrocarbon Contamination on the Eastern Side of the Access Road

Characterization of AEC 1e was conducted as part of the July 2017 investigation program. The extent of soil contamination in AEC 1e was delineated with three additional test pits to further refine the estimated extent of contaminated soil for remediation in this area.

The results of test pits completed as part of the July 2017 investigation program were less than applicable CSR soil standards and, therefore, Golder's conceptual understanding of AEC 1e has not changed relative to conclusions drawn following the January 2017 investigation. Further investigation work is not considered necessary prior to implementation of remediation works. The estimated volume of contaminated soil within AEC 1e is shown on Table 11, below.

7.4 AEC 19a and 19b – Inferred Industrial Buildings on 1951 Gator Map

Contamination at AEC 19a was identified based on a concentration of LEPH that exceeded the applicable CSR WL_R and IL standards in the top 1.4 m of soil at one location (K19-MW17-04). Based on the relatively shallow nature of the contamination identified at K19MW17-04, the contamination was associated with historical activities conducted near the inferred industrial buildings. Based on field observations and a review of the test pit log, contamination in this location was suspected to reflect a relatively small localized area of contamination, and was considered as having been delineated for remedial design purposes.

Based on the results of the January 2017 investigation work, one monitoring well was installed in the inferred down-gradient portion of AEC 19a in order to determine whether the identified soil contamination may have affected groundwater quality. Although the results of the July 2017 investigation did not identify groundwater contamination, soil contamination was identified at a depth of approximately 8.0 m bgs to 11.0 m bgs. For ease of reference this area is now referred to AEC 19b. Given that the test pits in this area did not extend beyond 4 m bgs, it is possible another source of hydrocarbon contamination is present at AEC 19b. Additional borehole investigations will allow a better determination of lateral and vertical extent be made. Based on the current information, given the depth of the observed soil contamination at AEC 19b, excavation of this material is not considered practical. However, delineation of the soil contamination is recommended in order to support risk-based remediation of this AEC.

7.5 AEC 23a – Inferred Industrial Buildings on 1951 Gator Map

Characterization of AEC 23a was conducted as part of the January/February 2017 investigation program. The extent of soil contamination in AEC 23a was generally delineated as part of the January investigation program, however additional test pitting was recommended to further refine the estimated extent of contaminated soil for remediation in this area. Results of the investigation indicated one area on the eastern edge of AEC 23a.

The results of test pits completed as part of the July 2017 investigation program were less than applicable CSR soil standards and, therefore, Golder's conceptual understanding of AEC 23a has not changed relative to conclusions drawn following the January 2017 investigation. Further investigation work is not considered necessary prior to implementation of remediation works. The estimated volume of contaminated soil within AEC 23a is shown on Table 11, below.

8.0 CONCLUSIONS

Golder was retained by PWGSC to conduct a soil and groundwater characterization program at selected APECs and AECs at K-19, Former Trutch Townsite located at KM 320 of the old alignment of the Alaska Highway.

The primary objectives of the investigation program were to:

1) Further delineate the extents of the known AECs.

2) Investigate more recently identified APECs to determine if additional areas of the Site will require remediation.

3) Support remediation planning for Fiscal Years 2017-2018 and 2018-2019.

The overall objectives of the July 2017 investigation program were substantially met. However, soil and groundwater hydrocarbon contamination at AEC 1b has, however, not been delineated on the west side of the former Alaska Highway alignment. Therefore, further investigation is warranted prior to implementation of a remediation program for off-Site areas of contamination.

Based on the results of site investigation works conducted to July 2017, nine areas (as defined on Figure 17) have been identified to have petroleum hydrocarbon related contamination in soils and are carried forward for remedial excavation work. Table 11, below provides a summary of the aerial extent, approximate depth, and approximate volume of petroleum hydrocarbon contamination in these areas that would be targeted for remedial excavation.

It should be noted that remedial excavation works have been conducted at the Site in 2017, concurrently with the preparation of this report. Remediation work conducted in Fiscal Year 2017/2018 included excavation of contaminated soil in AEC 1b and AEC 1c. The results of this work will be documented under separate cover.

Table 11: Summary of AECs Retained for Remedial Excavation

APEC / AEC	Description	Estimated Aerial Extent (m^2)	Approximate Depth Range of Contamination (m bgs)	Approximate Volume proposed for Remedial Excavation (m^3)[1]	Status
AEC 1a	Suspected Maintenance Garage	100	0 – 3	300	Area for remediation is delineated.
AEC 1b	*Suspected Maintenance Garage*	*4,200*	*0 – 8.6*	*19,500(2)*	*Area for remediation is partially delineated. Petroleum hydrocarbon contamination in soil and groundwater extends to the former alignment. Offsite delineation has not been completed.* *Remediation of on-Site soil contamination was implemented during September/October 2017*
AEC 1c	*Suspected Maintenance Garage*	*1,900*	*0 – 4*	*6,600*	*Area for remediation is delineated. Remediation excavation implemented in October and November 2017.*

APEC / AEC	Description	Estimated Aerial Extent (m^2)	Approximate Depth Range of Contamination (m bgs)	Approximate Volume proposed for Remedial Excavation (m^3)[1]	Status
AEC 1e	Suspected Maintenance Garage	100	0 – 1	100	Area for remediation is generally delineated.
AEC 2a	Suspected Maintenance Garage	530	0 – 5	1,900	Area for remediation is delineated.
AEC 2b	Suspected Maintenance Garage	1,830	0 – 4	7,700	Area for remediation is delineated.
AEC 19a	Inferred industrial buildings on 1951 Gator map (i.e., large buildings with vehicle access)	210	0 – 3	500	Area for remediation is generally delineated.
AEC 23a	Inferred industrial buildings on 1951 Gator map (i.e., large buildings with vehicle access)	1,220	0 – 4	2,800	Area for remediation is generally delineated.
AEC 23b	Inferred industrial buildings on 1951 Gator map (i.e., large buildings with vehicle access)	70	0 – 1	100	Area for remediation is generally delineated. Additional test pitting should be considered to further refine the estimated extent for remediation.
Total Approximate Volume for Remedial Excavation in confirmed AECs				**39,500**	Estimated volumes are preliminary and are based on the level of delineation detailed above. Additional investigation should be considered to further refine the estimated extents for remediation.

Notes:

1) Volumes shown are approximate and are based on the estimated extents of petroleum hydrocarbon contamination shown on Figure 17. Volumes are preliminary and are provided for planning purposes only. Volumes take into account areas where clean overburden materials are present above contaminated soils and assume that clean overburden materials can be reused as backfill.
2) Volume estimate for AEC 1b assumes a maximum excavation depth of 6 m bgs in the area northeast of the former alignment. Volume for remedial excavation assumes that low level exceedances at depth greater than 6 m bgs can be addressed through risk assessment and post remediation monitoring. Volume estimate is based on conceptual understanding of Site conditions at the end of July 2017 and prior to implementation of remediation work implemented in September through November 2017,
3) Italic font denotes AECs where remedial excavation work has been implemented concurrently with the preparation of this report.

In addition to the nine AECs outlined above, which have been retained for remedial excavation, 23 AECs have been retained for risk assessment purposes. Contaminants of concern associated with these AECs consist of toluene in soil (AEC 19b); metals and sodium and chloride ions in both soil and groundwater.

It is anticipated that remaining remedial planning work to be conducted as part of the Fiscal Year 2017/2018 will include off-site delineation to assess the lateral extent of soil and groundwater hydrocarbon contamination to the west of AEC 1b (west of the former highway alignment).

Further to the Revised RAP/RMP (Golder 2016d), risk assessment of metals and sodium/chloride contamination in soil and groundwater has been recommended as a component of the remedial design for the Site. The risk assessment is also anticipated to include an assessment of residual hydrocarbon contamination in soil and groundwater, following implementation of remedial excavations through post remediation groundwater and soil vapour monitoring.

The level of investigation to evaluate metals and sodium/chloride contamination is currently considered sufficient to support the preliminary stages of a risk assessment for the Site. Additional assessment of metals and/or salt contaminated soil and groundwater may be required to support completion of a detailed risk assessment.

9.0 CLOSURE

We trust this information is sufficient for your needs at this time. Should you have any questions or concerns, please do not hesitate to contact the undersigned at 604-296-4200.

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10.0 REFERENCES

BC MOE. 2010. Protocol 4 for Contaminated Sites – Establishing Background Concentrations in Soil, (MOE, 1 November 2017). Available at URL: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/site-remediation/docs/protocols/p_04.pdf

Canadian Council of Ministers of the Environment (CCME). 1999 (updates to 2014). Canadian Environmental Quality Guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg, MB. Available at: http://ceqg-rcqe.ccme.ca/

CCME. 2008. Canada-Wide Standard for Petroleum Hydrocarbons (PHC) in Soil: Scientific Rationale Supporting Technical Document. January 2008. Available at: http://www.ccme.ca/assets/pdf/pn_1399_phc_sr_std_1.2_e.pdf

Franz Environmental Inc. 2010a. Site K-19 Phase I Environmental Site Assessment, Trutch Townsite, Management Area 1, Alaska Highway, BC. Report number 1200-0904. Dated March 2010.

Franz Environmental Inc. 2010b Site K-19 Phase II Environmental Site Assessment, Trutch Townsite, Management Area 1, Alaska Highway, BC. Report number 1200-0905. Dated March 2010.

Franz Environmental Inc. 2011. Site K-19 Phase III Environmental Site Assessment, 202 Road NWSC Maintenance Camp, Management Area 1, Alaska Highway, BC. Report number 1200-1005. Dated March 2011.

Franz Environmental Inc. 2014. Site K-19 Supplemental Investigation Report, Trutch Townsite, Management Area 1, Alaska Highway, BC. (No report number). Dated March 2014.

Golder Associates Ltd. 2017a. Updated Sampling and Analysis Plan for K-19 Trutch, Former Alaska Highway Alignment, BC. Report Number 1657709-038-L-RevA. Dated 27 June 2017.

Golder Associates Ltd. 2017b. Assessment of Potential Effects – K-19 Trutch environmental investigation. Report Number 1657709-031-TM-Rev0-4000. Dated 8 February 2017

Golder Associates Ltd. 2017c. Supplementary Report on Environmental Investigation – K19 Trutch Former Townsite, Alaska Highway, Northern, BC. Report Number 1657709-034-R-Rev0

Golder Associates Ltd. 2016a. Revised Report on the 2016 Environmental and Geophysical Investigation – K-19 Trutch Former Townsite, Alaska Highway, Northern BC. Report Number 1654980-006-R-Rev0. Dated 22 August 2016.

Golder Associates Ltd. 2016b. Factual Report on Soil Characterization Program – K19 Trutch Former Townsite, Alaska Highway, Northern BC. Report Number 1657709-019-Rev0-3000. Dated 8 November 2016.

Golder Associates Ltd. 2016c. Supplemental Site Investigation – K19 Trutch Former Townsite, Alaska Highway, Northern BC. Report Number 1657709-016-R-Rev0/2000. Dated 26 September 2016.

Golder Associates Ltd. 2016d. Revised Remedial Action Plan / Risk Management Plan – K19 Trutch Former Townsite, Alaska Highway, Northern, BC. Report Number 167709-008-R-Rev1-2000

Golder Associates Ltd. 2016e. Work Plan and Cost Estimate for an Environmental, Geotechnical and Geophysical Investigation at Site K-19, and for Environmental and/or Geophysical Investigations at Sites K-12, K-19, K21, L-07, Alaska Highway, Northern BC. Report number P1651074-001. Dated 17 February 2016.

Government of Canada, 2017. Almanac Average and Extremes. Fort Nelson A. British Columbia. Available at: http://climate.weather.gc.ca/climate_data/almanac_e.html?StationID=50819 [Last accessed 9 February 2017].

Province of British Columbia 2016a. Ministry of Environment. 2016. Ministerial Order No. M 426. (BC Reg. 253/2016, O.C. 1480/96 [effective 1 November 2017]).

Province of British Columbia. Ministry of Environment. 2004. Environmental *Management Act*. (SBC 2003, includes 2011 Bill 13, c. 13 amendments [effective 2 June 2011]).

Province of British Columbia. Ministry of Environment. 2006. Hazardous Waste Regulation. (BC Reg. 63/88, O.C. 268/88 including amendments up to BC Reg. 179/2016 amendments [effective 19 July 2016]).

Province of British Columbia. Ministry of Environment. 1996. Contaminated Sites Regulation. (BC Reg. 375/96, O.C. 1480/96 including amendments up to BC Reg. 184/2016 [effective 19 July 2016]).

Table 12
Results of Soil Analyses - Metals and Inorganics
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_H (< 3m) $Stage10_3$	Notes	BC CSR Standards for IL (> 3m) $Stage\ 10_3$	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-10TP-21 K19-10TP-21-2 B068605 7-Aug-10 0.6-0.9	K19A-10BH-11 K19A-10BH-11-1 B073093 17-Aug-10 0.3-0.6	K19A-10MW-24 K19A-10MW-24-1 B076441 24-Aug-10 0.3-0.6	K19A-10MW-28 K19A-10MW-28-1 B077440 25-Aug-10 0.2-0.6	K19B-10MW-12 K19B-10MW-12-1 B073095 17-Aug-10 0.2-0.3	K19-MW16-01S K19-MW16-01S/SA1 B619198 7-Mar-16 1.8-2.1	K19-MW16-02 K19-MW16-02/SA1 B619198 8-Mar-16 0.8-1.1	K19-MW16-02 K19-MW16-02/SA2 B619198 8-Mar-16 1.8-2.1	K19-MW16-03 K19-MW16-03/SA1 B619198 8-Mar-16 0.9-1.2	K19-MW16-03 K19-MW16-03/SA2 B619198 8-Mar-16 1.5-1.8	K19-MW16-04 K19-MW16-04/SA2 B619198 9-Mar-16 2.0-2.6	K19-MW16-05 K19-MW16-05/SA2 B619203 9-Mar-16 2.7-3.0
Physical Tests																			
pH					6 to 8		5.38	5.71	4.78	5.66	5.48	6.64	-	6.92	6.99	7.08	7.87	7.99
pH (soluble)					6 to 8		-	-	-	-	-	-	-	-	-	-	7.59	-
Inorganic Compounds																			
Chloride (ion)	**100**	DW	100	DW			-	-	-	-	-	7.7	6	-	2.4	3.7	11.9	13.00
Sodium (ion)	**200**	T	1000	T			-	-	-	-	-	7.3	19.5	-	7.5	9.8	6.7	12.20
Metals																			
Aluminum	**40,000**	HH	250,000	HH			8890	7820	13000	11400	5790	3450	-	4590	5360	4350	8410	9290
Antimony	**20**	EH	40	EH	20		< 0.70	0.33	0.57	0.37	0.44	0.33	-	0.5	0.54	0.43	0.32	0.27
Arsenic	**10**	P4	10	P4	12		**12.8**	7.82	9	8.1	6.75	4.35	-	5.71	5.67	4.71	6.87	**10.50**
Barium	**500**	P4	500	P4	500	RL/PL	**602**	250	244	318	236	271	-	265	217	279	**552**	**1010**
Beryllium	**1-150**	AW/T	1-350	AW/T/PH	4		0.54	0.49	0.72	0.85	0.32	<0.40	-	<0.40	0.47	<0.40	0.69	0.74
Bismuth							0.26	0.21	0.17	< 0.10	0.14	<0.10	-	0.12	0.13	0.1	0.32	0.33
Boron	**15,000**	HH	1,000,000	HH	2	AL	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	**1 - 30**	AW/T	1 - 50	AW/PH	1.4	AL	0.147	0.13	0.079	0.145	0.085	0.083	-	0.107	0.143	0.133	0.415	0.17
Calcium							2440	1640	944	2100	1110	919	-	1510	1730	1510	2530	2420
Chromium (total)	**50**	P4	50	P4	64		14.1	11.5	20.2	19.9	9	37.7	-	11.6	15.8	17.8	15.2	25.0
Cobalt	**25**	P4	25	P4	40		13.1	6.35	7.28	10.8	3.37	1.29	-	2.32	4.81	1.88	9.16	5.72
Copper	**75 - 150**	AW/T	75 - 300	AW/T	63		22.5	17.7	26.2	25.7	13.7	7.95	-	12.9	16.8	11.2	35.7	21.6
Iron	**40,000**	P4	150,000	HH			26000	22300	24300	22900	15000	7590	-	12600	12800	9450	14600	22800
Lead	**120**	I	120 - 1000	DW/T/PH	70	AL	21.1	12.4	13.2	16.2	10.9	6.8	-	8.5	9.36	7.47	15.5	15.1
Lithium	**65**	HH	450	HH			-	-	-	-	-	<5.0	-	5.5	6.6	5.6	18.9	17.1
Magnesium							2250	2030	2920	2890	1440	720	-	1010	1130	900	2610	2740
Manganese	**2000**	DW/T	2,000	DW/T			331	180	142	242	68	14.8	-	39.9	46.4	21.8	60	65.20
Mercury	**25**	I	75	T	6.6		0.082	< 0.050	0.072	0.063	< 0.050	<0.050	-	0.052	<0.050	<0.050	<0.050	< 0.050
Molybdenum	**15**	DW	15	DW	5	AL	1.8	1.3	1.52	1.56	0.88	1.8	-	0.98	1.44	1.53	0.54	1.34
Nickel	**70 - 150**	DW/T/PH	70 - 250	DW/T/PH	45		22.8	18	20.1	27.9	9.71	5.83	-	9.17	15.6	8.3	23.7	22.5
Phosphorous							823	542	379	588	400	448	-	733	667	689	476	761
Potassium							1390	861	1290	1550	865	1120	-	1340	1320	1220	1970	2150
Selenium	**4**	P4	4	P4	1		< 0.50	< 0.50	< 0.50	0.57	< 0.50	<0.50	-	<0.50	<0.50	<0.50	**7.46**	**4.19**
Silver	**20**	EH	40	EH	20		0.118	0.083	0.052	0.096	0.094	0.091	-	0.169	0.113	0.126	0.214	0.21
Sodium (total)				T			218	< 100	< 100	< 100	< 100	119	-	144	110	186	<100	< 100
Strontium	**20,000**	HH	150,000	HH			40.8	17.1	21.9	30.1	16.4	48.2	-	27.4	22.6	23.5	23.7	27.0
Thallium	**2**	DW/AW/I	2	DW/AW/I	1		0.186	0.123	0.17	0.173	0.11	0.12	-	0.112	0.124	0.104	0.152	`
Tin	**50**	EH	300	EH	5	AL	0.54	0.45	0.49	0.42	0.29	0.19	-	0.26	0.27	0.25	0.49	0.57
Titanium							8.2	17.7	14.4	2.8	10	7.1	-	7.3	7.9	7.5	9.9	13.1
Uranium	**30**	DW	30	DW	23		-	-	-	-	-	0.822	-	0.951	1	0.817	1.78	2.27
Vanadium	**100**	DW	100	DW	130		27.5	27.1	36	34.7	16.8	13.9	-	19.6	20.6	17.3	20.5	19.8
Zinc	**150 - 450**	AW/T/pH	150 - 450	AW/T/pH	200		74.9	70.2	81.4	108	45.7	24.7	-	32.4	61.1	32.4	75.8	102
Zirconium							0.56	0.9	2.51	3.52	1.27	1.68	-	2.2	2.06	2.09	2.81	2.51

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs= metres below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

pH = Standard is pH dependant

P4 = BC MoE Protocol 4 For Contaminated Sites

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

Table 12
Results of Soil Analyses - Metals and Inorganics
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_{LR} (< 3m) Stage10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-MW16-06	K19-MW16-07	K19-MW16-07	K19-MW16-08	K19-MW16-09	K19-MW16-09	K19-MW16-10	K19-MW16-11	K19-MW16-12	K19-MW16-13	K19-MW16-14	K19-MW16-15	K19-TP16-01	K19-TP16-02	K19-TP16-03	K19-TP16-04	K19-TP16-05	K19-TP16-06	K19-TP16-07	K19-TP16-07	K19-TP16-08
Sample Control Number							K19-MW16-06/SA2	K19-MW16-07/SA1	K19-MW16-07/SA2	K19-MW16-08/SA1	K19-MW16-09/SA2	MW16-90/SA2/DUP-FD	K19-MW16-10/SA1	K19-MW16-11/SA1	K19-MW16-12/SA1	K19-MW16-13/SA2	K19-MW16-14/SA2	K19-MW16-15/SA1	K19-TP16-01/SA2	K19-TP16-02/SA2	K19-TP16-03/SA2	K19-TP16-04/SA2	K19-TP16-05/SA1	K19-TP16-06/SA2	K19-TP16-07/SA2	TP16-07/SA2-DUP	K19-TP16-08/SA1
Laboratory Report Number							B619203	B619203	B619203	B619935	B619935	B619935	B619935	B619935	B619935	B620735	B620735	B620735	B619198	B619198	B619198	B619198	B619198	B619198	B619198	B619198	B619198
Date Sampled							10-Mar-16	10-Mar-16	10-Mar-16	11-Mar-16	11-Mar-16	11-Mar-16	12-Mar-16	13-Mar-16	13-Mar-16	14-Mar-16	14-Mar-16	14-Mar-16	6-Mar-16	7-Mar-16	7-Mar-16	8-Mar-16	8-Mar-16	8-Mar-16	9-Mar-16	9-Mar-16	9-Mar-16
Depth of Sample (m bgs)							1.5	0.8-1.1	2.1-2.4	1.2-1.5	2.1-2.4 FDA	2.1-2.4 FD	0.9-1.2	Unknown	0.8-1.2	1.2-1.5	1.5-1.7	0.5-1.1	2.0	1.5	2.9	2.2	1.9	2.4	1.5 FDA	1.5 FD	0.5
QA/QC																											
APEC																											
Physical Tests																											
pH					6 to 8		8.14	7.91	7.27	5.1	5.85	5.49	7.08	5.49	5.42	7.31	6.39	5.3	6.24	6.21	6.88	4.33	6.76	5.97	6.06	5.91	-
pH (soluble)					6 to 8		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inorganic Compounds																											
Chloride (ion)	**100**	DW	100	DW			-	3.50	-	6.4	6.6	7.6	5	-	6.1	< 2.6	8.8	-	17.4	8.8	10.3	20.7	4.7	5.3	-	-	**166**
Sodium (ion)	**200**	T	1000	T			-	15.80	-	3.3	7.4	8.2	3.9	-	< 3.1	5.4	9	-	25	7.3	4.3	16.1	6.9	5	-	-	190
Metals																											
Aluminum	**40,000**	HH	250,000	HH			9980	10300	10000	15300	13600	14000	4220	14000		3250	5190	10700	5850	5140	5780	11600	11600	10100	7910	7350	-
Antimony	**20**	EH	40	EH	20		0.30	0.51	0.52	0.56	0.25	0.32	0.34	0.48	0.28	0.48	0.62	0.61	0.85	0.83	0.45	0.57	0.4	0.53	0.44	0.4	-
Arsenic	**10**	P4	10	P4	12		6.73	9.30	9.08	8.26	6.85	8.61	5.16	8.93	5.64	0.8	5.87	8.4	8.4	7.27	8.28	**11.9**	7.28	8.77	8.51	7.93	-
Barium	**500**	P4	500	P4	500	RL/PL	374	**747**	308	280	470	**567**	206	332	427	148	217	143	**508**	419	363	**551**	**593**	**599**	**563**	**511**	-
Beryllium	**1-150**	AW/T	1-350	AW/T/PH	4		0.77	0.63	0.52	0.87	0.68	0.77	< 0.40	0.96	0.75	< 0.40	0.53	0.61	0.61	<0.40	0.48	0.94	0.92	0.63	0.53	0.54	-
Bismuth							0.31	0.23	0.25	0.23	0.31	0.31	< 0.10	0.24	0.29	< 0.10	0.13	0.21	0.2	0.17	0.2	0.26	0.29	0.28	0.2	0.2	-
Boron	**15,000**	HH	1,000,000	HH	2	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	**1 - 30**	AW/T	1 - 50	AW/PH	1.4	AL	0.46	0.55	0.34	0.199	0.138	0.202	0.111	0.245	0.196	0.13	0.153	0.168	0.272	0.152	0.227	0.449	0.252	0.319	0.312	0.207	-
Calcium							2780	4130	2430	1380	2090	2280	1520	3100	1700	1230	1640	843	1930	1270	1990	2240	3900	2420	1860	1850	-
Chromium (total)	**50**	P4	50	P4	64		14.3	16.9	17.1	23.9	21.3	22.8	14.9	21.8	15.7	10.1	13	17.7	12.4	10.3	11.2	20.8	17	17.5	14.2	13	-
Cobalt	**25**	P4	25	P4	40		19.00	11.20	4.58	10	4.22	7.74	3.11	8.41	4.44	2.61	3.94	7.85	4.67	6.75	8.31	12	7.07	9.42	6.09	4.26	-
Copper	**75 - 150**	AW/T	75 - 300	AW/T	63		31.4	24.1	18.2	22.7	20.4	25.8	9.52	24.8	20.7	9.43	13.2	16.2	23.8	23	22.5	29.6	27.6	30.7	19.3	17	-
Iron	**40,000**	P4	150,000	HH			15100	22400	20800	21700	20100	26500	9800	25500	14900	9780	13800	21000	26400	22300	19700	24700	30600	21300	20800	21900	-
Lead	**120**	I	120 - 1000	DW/T/PH	70	AL	16.1	14.5	15.7	14.5	15	16.8	7.87	14.8	15.2	8.9	9.26	13.9	12.1	11.8	11.8	16.9	17.6	19.8	14.1	13.7	-
Lithium	**65**	HH	450	HH			22.5	16.5	16.4	15.3	17.1	16.3	5.2	18	11.8	< 5.0	6.1	14.4	8	5.3	9.8	17.3	13.3	14.4	12	11.2	-
Magnesium							3000	2570	2440	2890	3000	2850	777	3020	2080	797	1150	2390	1320	1080	1440	3000	2930	2370	1900	1840	-
Manganese	**2000**	DW/T	2,000	DW/T			46.90	381.00	99.10	162	56.2	120	68.8	185	54.1	149	41.1	166	153	53.7	137	100	93.6	233	368	208	-
Mercury	**25**	I	75	T	6.6		0.06	0.07	0.07	0.059	< 0.050	0.052	< 0.050	0.057	0.055	< 0.050	< 0.050	< 0.050	0.079	<0.050	0.058	0.07	0.082	0.068	0.09	0.08	-
Molybdenum	**15**	DW	15	DW	5	AL	0.56	1.47	1.18	1.41	0.57	0.85	0.73	1.57	0.5	0.46	1.14	1.76	1.86	1.7	1.18	1.7	0.96	1.31	1.13	0.96	-
Nickel	**70 - 150**	DW/T/PH	70 - 250	DW/T/PH	45		47.5	30.8	14.4	19.1	18.7	23.4	10.1	24.1	14.9	8.89	9.06	15.8	15.3	17.6	21.8	35	22.2	28.5	25.2	20.1	-
Phosphorous							435	786	615	501	386	491	411	548	396	558	700	327	1160	922	772	716	1350	683	734	725	-
Potassium							2140	1930	2260	2120	2540	2750	987	2140	2070	967	1300	1300	1520	1420	1450	2140	2530	1910	1910	1790	-
Selenium	**4**	P4	4	P4	1		1.70	< 0.50	0.85	< 0.50	< 0.50	0.61	< 0.50	0.62	< 0.50	< 0.50	< 0.50	< 0.50	0.64	0.55	<0.50	1.57	0.78	0.62	<0.50	<0.50	-
Silver	**20**	EH	40	EH	20		0.17	0.23	0.27	0.092	0.075	0.12	0.076	0.082	0.059	0.266	0.126	0.061	0.39	0.271	0.284	0.252	0.235	0.172	0.244	0.189	-
Sodium (total)				T			< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	266	< 100	< 100	< 100	167	264	150	<100	209	<100	193	192	-
Strontium	**20,000**	HH	150,000	HH			23.4	40.7	57.2	31.3	23.9	47.9	28.8	33.4	53.5	7.81	35.9	18	45.6	37.7	39.6	35.7	67.7	51.4	48.3	43.1	-
Thallium	**2**	DW/AW/I	2	DW/AW/I	1		0.13	0.22	0.16	0.237	0.138	0.166	0.116	0.199	0.14	0.122	0.106	0.098	0.182	0.188	0.195	0.231	0.224	0.209	0.216	0.188	-
Tin	**50**	EH	300	EH	5	AL	0.53	0.49	0.53	0.66	0.68	0.68	0.22	0.63	0.59	0.23	0.44	0.52	0.31	0.33	0.34	0.72	0.55	0.63	0.47	0.45	-
Titanium							11.1	12.6	12.6	13.5	9.3	8.7	6.2	15.3	7.9	5.2	8.7	13.8	9.9	11.6	9.8	22	17	16.4	13.3	9.8	-
Uranium	**30**	DW	30	DW	23		0.97	0.86	0.96	1.23	0.92	1.28	0.651	1.07	1.03	1.21	0.771	0.629	2.03	1.39	1.13	1.92	2.3	1.68	1.45	1.29	-
Vanadium	**100**	DW	100	DW	130		17.7	30.9	24.9	43.8	28.3	32.6	16.2	38.1	22.1	14.2	21.5	33.8	28.7	22.4	19.9	35.5	26.4	28.9	23.6	21.4	-
Zinc	**150 - 450**	AW/T/pH	150 - 450	AW/T/pH	200		174	109	62.60	82.9	52.9	81.5	37.5	108	64.9	34.4	49.6	75.9	81	71.8	84.4	117	89.5	105	69.6	59	-
Zirconium							2.99	2.29	2.71	3	1.64	1.91	1.45	2.48	1.5	1.75	1.76	1.7	3.14	2.29	2.36	4.52	2.74	2.05	2.62	2.46	-

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs= metres below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

pH = Standard is pH dependant

P4 = BC MoE Protocol 4 For Contaminated Sites

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

Table 12
Results of Soil Analyses - Metals and Inorganics
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_{LR} (< 3m) Stage10$_3$	Notes	BC CSR Standards for IL (> 3m) Stage 10$_3$	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-TP16-08	K19-TP16-09	K19-TP16-09	K19-TP16-10	K19-TP16-11	K19-TP16-11	K19-TP16-13	K19-TP16-15	K19-TP16-15	K19-TP16-17	K19-TP16-18	K19-TP16-18	K19-TP16-18	K19-TP16-19	K19-TP16-19	K19-TP16-20	K19-TP16-20	K19-TP16-23	K19-TP16-23	K19-TP16-27	K19-SS16-01
Sample Control Number							K19-TP16-08/SA4	K19-TP16-09/SA2	K19-TP16-09/SA3	K19-TP16-10/SA2	K19-TP16-11/SA2	K19-TP16-11/SA2 DUP	01463-06	01465-01	01465-04	01465-09	01466-01	01466-03	01466-05	01466-07	01466-08	01466-11	01466-12	01481-05	01481-07	01483-03	01481-09
Laboratory Report Number							B619198	B619206	B619206	B619206	B619206	B619206	B674520	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675549	B675549	B675549	B675549
Date Sampled							9-Mar-16	9-Mar-16	9-Mar-16	10-Mar-16	10-Mar-16	10-Mar-16	29-Aug-16	29-Aug-16	29-Aug-16	30-Aug-16	30-Aug-16	30-Aug-16	30-Aug-16	30-Aug-16	30-Aug-16	30-Aug-16	30-Aug-16	30-Aug-16	30-Aug-16	31-Aug-16	31-Aug-16
Depth of Sample (m bgs)							2.8	1.9	2.8	1.9	2.0	2.0	1.0	2.1	0.5	0.5	0.5	1.5	1.5	0.5	1.0	1.0	1.5	0.5	1.5	0.4	0.27
QA/QC											FDA	FD						FDA	FD								
APEC																											
Physical Tests																											
pH					6 to 8		-	-	6.81	6.28	6.22	6.01	5.21	5.39	5.38	5.87	5.06	6.13	6.57	6.18	6.16	5.02	6.56	5.65	6.55	6.37	5.31
pH (soluble)					6 to 6		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inorganic Compounds																											
Chloride (ion)	100	DW	100	DW			1030	4	-	4	-	-	-	64.7	-	16.7	-	-	-	-	4.8	5.6	-	-	-	-	-
Sodium (ion)	200	T	1000	T			121	8.1	-	4.2	-	-	-	15.50	-	13.50	-	-	-	-	8.00	4.40	-	-	-	-	-
Metals																											
Aluminum	40,000	HH	250,000	HH			-	-	11400	8930	9690	10100	4610	4250	14900	11200	9860	4230	4160	10100	5760	9890	6290	12700	9270	12500	10600
Antimony	20	EH	40	EH	20		-	-	0.57	0.41	0.36	0.42	0.48	0.73	0.56	0.63	0.6	0.6	0.56	0.58	0.46	0.63	0.51	0.97	0.56	0.68	0.64
Arsenic	10	P4	10	P4	12		-	-	8.98	8.08	8.82	8.88	6.67	6.55	8.78	9.58	7.83	7.7	7.02	7.93	7.64	8.76	5.56	8.93	9.81	9.72	8.67
Barium	500	P4	500	P4	500	RL/PL	-	-	477	352	**781**	**631**	237	474	219	286	264	374	384	249	234	270	416	346	**726**	474	364
Beryllium	1-150	AW/T	1-350	AW/T/PH	4		-	-	0.77	0.65	0.66	0.62	<0.40	<0.40	0.9	0.94	0.81	<0.40	<0.40	0.79	0.58	0.83	0.87	0.93	0.58	0.93	0.72
Bismuth							-	-	0.24	0.22	0.3	0.31	0.13	0.18	0.23	0.2	0.22	0.13	0.13	0.21	0.19	0.22	0.14	0.28	0.3	0.25	0.22
Boron	15,000	HH	1,000,000	HH	2	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	1 - 30	AW/T	1 - 50	AW/PH	1.4	AL	-	-	0.557	0.262	0.21	0.238	0.133	0.167	0.272	0.321	0.243	0.183	0.168	0.181	0.102	0.324	0.563	0.341	0.341	0.74	0.212
Calcium							-	-	3250	2140	2400	2850	1310	1420	1270	1510	2440	2790	2040	1900	1200	1530	2070	2540	2700	2540	1780
Chromium (total)	50	P4	50	P4	64		-	-	19.6	15.4	17.1	17.4	7.9	8.7	23.6	19.3	17.9	8.1	7.6	18	10.5	16.1	8.5	19.6	18.1	19.8	16.9
Cobalt	25	P4	25	P4	40		-	-	11.1	14.4	11.9	12.7	1.98	1.27	13.2	7.1	7.9	1.69	1.66	8.62	3.32	12.9	19.4	9.35	6.57	17.8	9.56
Copper	75 - 150	AW/T	75 - 300	AW/T	63		-	-	27.7	24.6	30.4	29.4	14.1	12.9	25.4	25.1	23.9	12.9	12.5	21	16	25	20.5	29.9	30.7	30.2	21.5
Iron	40,000	P4	150,000	HH			-	-	22900	22500	25600	25900	12600	14800	21900	22000	20700	13700	12600	20900	13900	21200	14600	21900	23100	25300	21000
Lead	120	I	120 - 1000	DW/T/PH	70	AL	-	-	14.5	13.6	17.7	17.7	7.92	11.3	14.7	12.9	13	9.62	9.66	13.9	9.42	13.1	8.95	15.8	19	16.1	14.1
Lithium	65	HH	450	HH			-	-	16.2	15.4	14.4	14.1	<5.0	5.9	17.8	12.5	11.9	5.1	5.1	11.7	7.8	11	11.2	14.2	13.2	16.4	11.9
Magnesium							-	-	3160	2290	2770	2790	1020	1090	3010	2670	2850	1280	1160	2420	1470	2390	1350	3150	2610	3120	2400
Manganese	2000	DW/T	2,000	DW/T			-	-	308	308	230	305	25.6	17.8	235	148	162	34.1	32	252	46.4	238	495	211	126	1750	317
Mercury	25	I	75	T	6.6		-	-	0.073	<0.050	0.053	0.056	<0.050	<0.050	<0.050	0.059	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.06	0.058	0.075	0.056
Molybdenum	15	DW	15	DW	5	AL	-	-	1.74	1.09	0.94	1.06	0.9	1.11	1.77	2.08	1.61	0.93	0.88	1.78	1.02	1.98	1.28	1.85	1.19	2.36	1.5
Nickel	70 - 150	DW/T/PH	70 - 250	DW/T/PH	45		-	-	33.5	32.2	29.2	31.9	7.67	6.23	28.1	23	20.3	8.78	8.82	20.8	9.41	23.5	32.8	30.2	25.6	**76.6**	23
Phosphorous							-	-	697	634	499	593	720	851	403	491	494	840	835	453	609	578	723	628	742	674	542
Potassium							-	-	1960	1620	1750	1740	1350	1390	1680	1310	1080	1240	1140	1180	1110	1010	1130	1580	2050	1590	1300
Selenium	4	P4	4	P4	1		-	-	<0.50	0.53	0.58	0.51	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.50	< 0.50	0.56	< 0.50
Silver	20	EH	40	EH	20		-	-	0.27	0.1	0.164	0.192	0.155	0.431	0.094	0.101	0.088	0.292	0.3	0.093	0.059	0.107	0.242	0.123	0.216	0.151	0.128
Sodium (total)				T			-	-	<100	<100	<100	<100	<100	207	187	316	554	295	279	201	176	<100	<100	< 100	113	185	< 100
Strontium	20,000	HH	150,000	HH			-	-	40.3	34.8	45.5	40.6	23.9	39.3	28.8	27.1	26.2	41.4	36.4	24.7	27.9	25.2	27	31.7	53.8	36.8	23.8
Thallium	2	DW/AW/I	2	DW/AW/I	1		-	-	0.276	0.146	0.157	0.186	0.105	0.224	0.241	0.222	0.171	0.189	0.18	0.173	0.103	0.186	0.15	0.237	0.171	0.303	0.155
Tin	50	EH	300	EH	5	AL	-	-	0.57	0.49	0.55	0.58	0.19	0.32	0.59	0.5	0.49	0.25	0.24	0.49	0.33	0.51	0.28	0.74	0.66	0.65	0.54
Titanium							-	-	28	14.7	10.2	13	10.4	8.5	25.9	28.3	18.2	8	6.6	14.4	10.9	16.8	6.3	17.7	12.6	20.9	14.5
Uranium	30	DW	30	DW	23		-	-	1.13	1.52	1.21	1.1	1.15	0.757	1.4	1.33	1.17	1.21	1.11	1.04	0.971	1.16	1.62	1.16	2.45	1.35	0.959
Vanadium	100	DW	100	DW	130		-	-	35	23.5	22.9	25.5	16	20.7	43.9	38.1	32	18	17.6	35.2	19.9	30.5	19.1	37	26.5	39	35.5
Zinc	150 - 450	AW/T/pH	150 - 450	AW/T/pH	200		-	-	108	111	102	105	40.9	32.5	110	98.2	85.7	38.6	36.6	87.2	51.1	99.1	108	113	88.6	200	85.3
Zirconium							-	-	4.74	1.97	2.28	2.52	1.92	2.22	2.88	3.48	2.69	1.91	1.93	1.63	0.79	2.84	2.07	3.47	2.49	3.86	0.94

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs= metres below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

pH = Standard is pH dependant

P4 = BC MoE Protocol 4 For Contaminated Sites

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

Table 12
Results of Soil Analyses - Metals and Inorganics
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_{LR} (< 3m) Stage10$_3$	Notes	BC CSR Standards for IL (> 3m) Stage 10$_3$	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-SS16-02	K19-SS16-03	K19-SS16-04	K19-TP16-28	K19-TP16-29	K19-TP16-30	K19-TP16-30	K19-TP16-31	K19-TP16-32	K19-TP16-33	K19-TP16-34	K19-TP16-37	K19-TP16-38	K19-TP16-39	K19-TP16-39	K19-TP16-40	K19-TP16-41	K19-TP16-41	K19-TP16-42	K19-TP16-42	K19-TP16-43
Sample Control Number							01481-10	01481-11	01481-12	01484-01	01484-07	01485-01	01485-04	01485-08	01486-02	01486-07	01486-11	01488-07	01488-11	01489-05	01489-07	01489-08	01489-10	01489-12	01490-05	01490-06	01490-11
Laboratory Report Number							B675549	B675549	B675549	B675954	B675954	B675954	B675954	B675954	B676013	B676013	B676013	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470
Date Sampled							31-Aug-16	31-Aug-16	31-Aug-16	31-Aug-16	1-Sep-16	1-Sep-16	1-Sep-16	1-Sep-16	1-Sep-16	1-Sep-16	2-Sep-16	2-Sep-16	3-Sep-16	3-Sep-16	3-Sep-16	3-Sep-16	3-Sep-16	3-Sep-16	3-Sep-16	3-Sep-16	3-Sep-16
Depth of Sample (m bgs)							0.34	0.4	0.32	2.0	1.7	2.5	2.5	2.5	2.0	1.7	3.0	2.5	1.0	2.0	2.0	1.0	0.5	0.7	1.0	2.0	0.8
QA/QC												FDA	FD							FDA	FD						
APEC																											
Physical Tests																											
pH					6 to 8		5.2	5.16	5.3	5.94	5.82	6.51	6.8	6.4	6.49	6.08	5.14	6.31	6.78	7.31	7.46	6.22	7.07	5.05	6.93	5.26	5.09
pH (soluble)					6 to 8		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inorganic Compounds																											
Chloride (ion)	**100**	DW	100	DW			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium (ion)	**200**	T	1000	T			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																											
Aluminum	**40,000**	HH	250,000	HH			10300	11100	10300	13000	12500	9210	7870	9730	9220	11800	2350	10900	12100	10400	10300	13100	2250	14400	12800	10300	13300
Antimony	**20**	EH	40	EH	20		0.59	0.54	0.58	0.83	0.59	0.53	0.57	0.53	0.42	0.62	0.55	0.57	0.56	0.64	0.59	0.65	0.43	0.66	0.59	0.36	0.52
Arsenic	**10**	P4	10	P4	12		8.42	8.24	8.75	**11.1**	**10.8**	7.78	7.05	8.21	7.57	9.62	5.5	9.16	8.98	8.76	8.7	9.66	4.9	10	9.01	9.73	8.42
Barium	**500**	P4	500	P4	500	RL/PL	290	298	257	330	390	278	255	337	**608**	390	196	**576**	393	**548**	**582**	366	464	188	**959**	**793**	339
Beryllium	**1-150**	AW/T	1-350	AW/T/PH	4		0.48	0.61	0.49	0.78	0.74	0.5	0.53	0.66	0.65	0.8	< 0.40	0.75	0.82	0.79	0.67	0.87	0.48	0.85	1.18	0.53	0.77
Bismuth							0.22	0.22	0.21	0.24	0.25	0.18	0.19	0.21	0.26	0.24	< 0.10	0.23	0.26	0.24	0.24	0.23	0.11	0.24	0.23	0.3	0.23
Boron	**15,000**	HH	1,000,000	HH	2	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	**1 - 30**	AW/T	1 - 50	AW/PH	1.4	AL	0.247	0.238	0.179	0.418	0.592	0.465	0.347	0.521	0.456	0.53	0.169	0.58	0.692	1.12	1.21	0.535	0.535	0.277	0.507	0.191	0.261
Calcium							1990	1940	1840	2420	2370	3420	2210	2400	2280	2610	611	2450	2530	3060	3050	2800	6050	918	3030	1720	855
Chromium (total)	**50**	P4	50	P4	64		16.8	17.2	16.1	22.7	22.2	16.5	14.1	17.6	14.6	21.1	3.7	19	20.3	18.4	17.8	22	2.9	22.9	20.1	19.5	20.3
Cobalt	**25**	P4	25	P4	40		6.38	7.49	7.68	11	13.9	8.22	7.6	9.66	11.8	10.2	1.76	12.2	18.5	21.9	12.1	10.7	2.54	8.64	9.88	4.55	7.37
Copper	**75 - 150**	AW/T	75 - 300	AW/T	63		19.4	44.3	16.9	29.8	32.1	19.7	20.9	25.8	34.6	30.5	9.55	30.3	27.9	28.8	27.3	30	17.1	26.8	25.7	34.1	23.5
Iron	**40,000**	P4	150,000	HH			23500	20000	21500	21800	24300	20900	16300	18400	19600	23800	8470	22100	26700	22600	20900	22500	6020	24400	21900	25400	20500
Lead	**120**	I	120 - 1000	DW/T/PH	70	AL	18.3	19.9	17.5	17.2	15.6	67.6	29.4	13.5	15.7	15.4	10.6	16	16	18	19.3	17	9.53	15.8	14.8	18.4	13.9
Lithium	**65**	HH	450	HH			11.7	12.6	10.7	15.9	14.8	11.2	11.1	12	13.8	14.6	< 5.0	13.6	15.7	14.5	14.1	15.5	< 5.0	17.4	16.5	17	14.9
Magnesium							2220	2360	2230	3010	2930	2010	1870	2280	2080	3190	401	2460	2990	2310	2300	3270	559	2720	2930	2270	2330
Manganese	**2000**	DW/T	2,000	DW/T			180	220	229	206	446	263	171	372	285	307	32	246	776	902	542	278	88	174	317	55.2	165
Mercury	**25**	I	75	T	6.6		< 0.050	< 0.050	< 0.050	0.059	0.059	< 0.050	< 0.050	< 0.050	0.07	0.081	< 0.050	0.073	0.077	0.082	0.07	0.078	0.138	0.077	0.073	0.103	0.066
Molybdenum	**15**	DW	15	DW	5	AL	1.54	1.42	1.54	1.81	2.27	1.55	1.65	1.81	1.18	1.93	1.3	2.04	1.45	1.84	1.85	1.97	0.97	2.02	1.42	0.79	1.45
Nickel	**70 - 150**	DW/T/PH	70 - 250	DW/T/PH	45		17.8	18.6	16.7	33	44.5	20.5	19.6	41.7	40.5	38.2	6.58	36.3	53.5	51.2	42.9	37.8	6.43	22.4	**133**	16.6	21.9
Phosphorous							478	504	458	597	667	666	566	680	820	656	316	702	794	937	961	657	329	466	638	858	428
Potassium							1280	1450	1240	1690	1580	1140	992	1350	1550	1600	673	1710	1910	1870	1910	1740	299	1550	1420	1800	1300
Selenium	**4**	P4	4	P4	1		< 0.50	< 0.50	< 0.50	0.59	0.66	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.53	0.64	0.58	0.63	< 0.50	0.9	0.8	0.65	0.75	0.5
Silver	**20**	EH	40	EH	20		0.219	0.2	0.13	0.149	0.188	0.146	0.123	0.209	0.204	0.219	0.24	0.177	0.203	0.248	0.305	0.202	0.127	0.068	0.328	0.179	0.057
Sodium (total)				T			< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	114	< 100	< 100	< 100	< 100	< 100	< 100	< 100	345	< 100
Strontium	**20,000**	HH	150,000	HH			23.6	24	22.5	34.6	38.2	27.4	24.7	30.2	35.5	34.7	17.3	34.8	38.2	37.5	36.2	33.5	100	26.1	38	74.2	22.9
Thallium	**2**	DW/AW/I	2	DW/AW/I	1		0.168	0.173	0.169	0.231	0.256	0.176	0.183	0.224	0.166	0.247	0.122	0.228	0.226	0.261	0.238	0.282	0.234	0.229	0.194	0.222	0.19
Tin	**50**	EH	300	EH	5	AL	0.7	0.62	0.8	0.6	0.59	0.52	0.45	0.48	0.46	0.6	0.13	0.59	0.59	0.51	0.51	0.59	0.32	0.59	0.56	0.53	0.58
Titanium							20.9	16.3	22.9	31.3	33.2	25.7	20.8	22.6	12.4	23.2	6.3	26.5	25.7	17.6	19.4	32.2	44.8	23.9	13.7	11.8	18.2
Uranium	**30**	DW	30	DW	23		0.806	0.785	0.756	1.3	1.44	0.96	1.33	1.06	2.5	1.23	0.64	1.49	1.72	1.13	0.951	1.17	0.685	1.4	0.944	1.45	1.02
Vanadium	**100**	DW	100	DW	130		37.4	38.6	38.9	41.3	40	34.7	29.4	32	25	38	13	33.7	35.7	36.1	34.5	41.5	11.1	40.8	38.5	26.8	36.6
Zinc	**150 - 450**	AW/T/pH	150 - 450	AW/T/pH	200		78.8	88.8	77.3	127	**176**	84.2	83.5	97.6	187	111	27	128	166	151	128	115	21.7	102	123	65.7	81.2
Zirconium							0.71	0.57	0.52	3.07	4.44	0.7	0.85	3.39	2.3	4.34	1.31	2.5	3.47	2.86	2.71	4.36	6.96	2.55	2.79	2.14	2.48

Notes:

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Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

pH = Standard is pH dependant

P4 = BC MoE Protocol 4 For Contaminated Sites

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

Table 12
Results of Soil Analyses - Metals and Inorganics
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_H (< 3m) Stage10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-TP16-44	K19-TP16-45	K19-TP16-46	K19-TP16-46	K19-TP17-01	K19-TP17-01	K19-TP17-02	K19-TP17-02	K19-TP17-03	K19-TP17-03	K19-TP17-04	K19-TP17-04	K19-TP17-04	K19-TP17-04	K19-TP17-05	K19-TP17-05	K19-TP17-05	K19-TP17-05	K19-TP17-05	K19-TP17-06	K19-TP17-07	K19-TP17-08
Sample Control Number							01491-04	01491-05	01491-10	01491-12	03343-01	03343-03	03343-06	03343-10	03343-12	03344-02	03344-05	03344-06	03344-07	03344-09	03344-10	03344-11	03344-12	03345-01	03345-02	03345-05	03345-11	03346-03
Laboratory Report Number							B676470	B676470	B676470	B676470	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358
Date Sampled							4-Sep-16	4-Sep-16	4-Sep-16	4-Sep-16	22-Jan-17	22-Jan-17	22-Jan-17	22-Jan-17	22-Jan-17	22-Jan-17	23-Jan-17	23-Jan-17	23-Jan-17	23-Jan-17	23-Jan-17	23-Jan-17	23-Jan-17	23-Jan-17	23-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17
Depth of Sample (m bgs)							0.8	0.5	0.5	2.0	0.5	2.4	0.5	2.5	0.5	2.5	0.5	2.5	1.5	**4.0**	0.5	0.5	1.6	2.6	**3.5**	0.5	0.5	0.5
QA/QC																					FDA	FD						
APEC																												
Physical Tests																												
pH					6 to 8		-	5.24	6.2	5.78	6.75	-	7.42	-	4.94	-	8.39	8.56			7.21	7.62	-	5.23	-	5.32	5.76	5.41
pH (soluble)					6 to 8		-	-	-	-	-	-																
Inorganic Compounds																												
Chloride (ion)	**100**	DW	100	DW			9.2	-	9.8	-	10	4	31.3	50.3	**3350**	**2400**	27.9	29.8	13	80	**1740**	**1080**	**1090**	**617**	143	10.2	23.8	9.2
Sodium (ion)	**200**	T	1000	T			12.20	-	7.30	-	10.6	6.7	72.1	28.5	**2050**	**883**	32.80	45.90	21.5	69.4	**989**	**695**	**443**	132	24	9.6	18.8	11.1
Metals																												
Aluminum	**40,000**	HH	250,000	HH			-	7410	6210	10200	12400	-	8370	-	14300	-	4590	8480	-	-	7650	6090	-	10500	-	15300	12700	13500
Antimony	**20**	EH	40	EH	20		-	0.51	0.91	0.4	0.8	-	0.62	-	0.71	-	0.44	0.54	-	-	0.65	0.49	-	0.66	-	0.65	0.64	0.52
Arsenic	**10**	P4	10	P4	12		-	8.63	4.57	9.31	**11.2**	-	7.98	-	**10.4**	-	7.01	7.92	-	-	9.00	6.78	-	8.62	-	9.61	9.00	9.68
Barium	**500**	P4	500	P4	500	RL/PL	-	115	280	**551**	325	-	331	-	302	-	309	251	-	-	346	270	-	368	-	330	228	301
Beryllium	**1-150**	AW/T	1-350	AW/T/PH	4		-	< 0.40	< 0.40	0.59	0.84	-	0.45	-	0.89	-	< 0.40	0.61	-	-	0.65	0.45	-	0.64	-	0.91	0.71	0.9
Bismuth							-	0.18	0.13	0.29	0.27	-	0.14	-	0.26	-	< 0.10	0.16	-	-	0.12	0.11	-	0.22	-	0.24	0.21	0.24
Boron	**15,000**	HH	1,000,000	HH	2	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	**1 - 30**	AW/T	1 - 50	AW/PH	1.4	AL	-	0.149	0.852	0.251	0.546	-	0.429	-	0.364	-	0.61	0.305	-	-	0.461	0.496	-	0.346	-	0.264	0.144	0.25
Calcium							-	609	3430	1950	3800	-	6600	-	2990	-	25600	4330	-	-	11800	18900	-	3070	-	2100	828	1170
Chromium (total)	**50**	P4	50	P4	64		-	14	11.5	18	21.3	-	15.8	-	24.3	-	17.9	15.2	-	-	15.5	13.1	-	17.8	-	24.3	20.8	22.4
Cobalt	**25**	P4	25	P4	40		-	5.93	3.25	7.41	10.8	-	7	-	12.2	-	5.62	8.02	-	-	8.07	6.85	-	8.6	-	13.6	13.5	8.85
Copper	**75 - 150**	AW/T	75 - 300	AW/T	63		-	9.68	12.1	32	32.4	-	17.3	-	31.5	-	11.4	19	-	-	18.8	12.8	-	27.1	-	26.2	22.8	23.4
Iron	**40,000**	P4	150,000	HH			-	19000	10500	27500	26000	-	21700	-	25300	-	28200	21600	-	-	26700	18700	-	21200	-	23800	25100	24000
Lead	**120**	I	120 - 1000	DW/T/PH	70	AL	-	12.4	79.7	17.9	17.5	-	95.7	-	16.8	-	7.36	14.2	-	-	18.8	15.1	-	14.7	-	15.4	15.4	17.7
Lithium	**65**	HH	450	HH			-	10.2	< 5.0	13.3	15.7	-	10.4	-	16.3	-	6.9	10.8	-	-	9.6	7.9	-	13.1	-	17.4	15.5	14.9
Magnesium							-	2340	1060	2470	3520	-	2410	-	3560	-	5950	2520	-	-	3680	5030	-	2850	-	3450	2790	2990
Manganese	**2000**	DW/T	2,000	DW/T			-	125	98.5	171	242	-	210	-	287	-	302	257	-	-	234	264	-	212	-	310	324	274
Mercury	**25**	I	75	T	6.6		-	< 0.050	0.077	0.057	0.086	-	< 0.050	-	0.091	-	< 0.050	< 0.050	-	-	< 0.050	< 0.050	-	0.068	-	0.074	0.053	0.05
Molybdenum	**15**	DW	15	DW	5	AL	-	1.95	1.26	0.84	2.33	-	1.85	-	2.06	-	2.51	1.68	-	-	2.17	1.82	-	1.71	-	1.83	2.61	1.6
Nickel	**70 - 150**	DW/T/PH	70 - 250	DW/T/PH	45		-	13.5	10	26.8	39	-	18.2	-	31.7	-	18.1	19	-	-	20	16.9	-	29.2	-	25.4	20.4	17.4
Phosphorous							-	310	581	480	696	-	661	-	630	-	1100	692	-	-	937	816	-	643	-	563	524	755
Potassium							-	882	791	1510	1780	-	1280	-	1890	-	994	1400	-	-	1220	982	-	1650	-	2030	1730	1750
Selenium	**4**	P4	4	P4	1		-	< 0.50	< 0.50	0.6	0.52	-	< 0.50	-	0.62	-	< 0.50	0.53	-	-	< 0.50	< 0.50	-	0.55	-	0.58	0.75	0.85
Silver	**20**	EH	40	EH	20		-	0.091	0.794	0.144	0.306	-	0.127	-	0.164	-	0.11	0.175	-	-	0.177	0.143	-	0.176	-	0.115	0.078	0.221
Sodium (total)				T			-	< 100	< 100	145	175	-	561	-	4970	-	118	2330	-	-	1910	1380	-	227	-	154	957	185
Strontium	**20,000**	HH	150,000	HH			-	12.8	19.6	49.9	37.9	-	29.8	-	35.7	-	47.9	25.4	-	-	38.3	36.9	-	34.6	-	31.9	22.3	21.4
Thallium	**2**	DW/AW/I	2	DW/AW/I	1		-	0.143	0.152	0.149	0.286	-	0.152	-	0.243	-	0.099	0.174	-	-	0.147	0.138	-	0.218	-	0.262	0.199	0.228
Tin	**50**	EH	300	EH	5	AL	-	0.39	5.28	0.55	0.67	-	0.46	-	0.7	-	0.29	0.44	-	-	0.48	0.41	-	0.51	-	0.66	0.54	0.58
Titanium							-	44.1	26.8	12.8	26	-	21.9	-	30.4	-	39.1	21.9	-	-	31.2	33.2	-	16	-	28.1	32	34.3
Uranium	**30**	DW	30	DW	23		-	0.512	0.625	1.94	1.43	-	1.27	-	1.35	-	0.832	1.1	-	-	1.07	0.949	-	1.09	-	1.39	1.17	1.36
Vanadium	**100**	DW	100	DW	130		-	36.5	29.5	26	39.7	-	30.4	-	44.8	-	26	33.1	-	-	36.1	29.5	-	33.3	-	46.4	39	47.5
Zinc	**150 - 450**	AW/T/pH	150 - 450	AW/T/pH	200		-	57.8	138	94.1	130	-	80.1	-	118	-	69.2	79	-	-	89.3	68.1	-	107	-	110	96.6	74.6
Zirconium							-	1.58	0.75	2.72	5.29	-	1.21	-	4.51	-	1.58	< 0.50	-	-	0.78	0.59	-	3.68	-	2.43	1.38	< 0.50

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs= metres below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

pH = Standard is pH dependant

P4 = BC MoE Protocol 4 For Contaminated Sites

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

Table 12
Results of Soil Analyses - Metals and Inorganics
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_{ah} (< 3m) $Stage10_3$	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-TP17-09	K19-TP17-09	K19-TP17-10	K19-TP17-10	K19-TP17-11	K19-TP17-12	K19-TP17-13	K19-TP17-13	K19-TP17-14	K19-TP17-16	K19-TP17-17	K19-TP17-18	K19-TP17-19	K19-TP17-20	K19-TP17-21	K19-TP17-24	K19-TP17-25	K19-TP17-26	K19-TP17-29	K19-TP17-31	K19-TP17-31	K19-TP17-32
Sample Control Number							03346-07	03346-08	03346-12	03347-01	03351-01	03351-06	03351-11	03351-12	03352-04	03347-06	03347-12	03348-05	03349-03	03349-09	03353-05	03355-02	03355-08	03350-02	03356-12	03361-02	03361-03	03361-07
Laboratory Report Number							B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210
Date Sampled							24-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	25-Jan-17	25-Jan-17	25-Jan-17	25-Jan-17	25-Jan-17	26-Jan-17	25-Jan-17	26-Jan-17	26-Jan-17	26-Jan-17	27-Jan-17	27-Jan-17	27-Jan-17	27-Jan-17
Depth of Sample (m bgs)							0.5	1.5	0.5	0.5	0.6	0.5	0.6	1.6	0.5	0.5	0.5	0.5	0.4	1.6	0.6	0.6	0.6	0.5	0.5	1.6	1.6	0.6
QA/QC									FDA	FD																	FD	
APEC																												
Physical Tests																												
pH					6 to 8		-	4.63	6.57	6.72	5.87	4.92	-	5.56	7.19	4.86	6.3	5.57	7.03	5.63	6.88	5.43	5.25	6.62	4.73	6.17	6.22	4.98
pH (soluble)					6 to 8														-	-	-	-	-	-	-	-	-	-
Inorganic Compounds																												
Chloride (ion)	**100**	DW	100	DW			**824**	-	6.9	8.4	50.1	6.2	3.7	-	7.9	34.5	59.5	9.9	**563**	37.3	3.8	4.7	3.4	11.7	6.7	6.3	3.3	4.7
Sodium (ion)	**200**	T	1000	T			**476**	-	13.3	21	77.4	4.2	<2.8	-	15.6	27.3	46.3	10.3	**344**	22.6	12.6	13.1	9.7	9.7	8.8	9.9	6.4	11.4
Metals																												
Aluminum	**40,000**	HH	250,000	HH			-	8910	8100	6020	8570	10100	-	13500	8010	13000	9580	12200	5880	7520	9100	10800	12500	8640	10900	11900	12100	10600
Antimony	**20**	EH	40	EH	20		-	0.47	0.36	0.39	0.37	0.53	-	0.54	0.42	0.74	0.53	0.39	0.37	0.56	0.58	0.55	0.61	0.41	0.59	0.49	0.51	0.56
Arsenic	**10**	P4	10	P4	12		-	9.71	7.84	7.11	9.75	9.25	-	9.06	7.24	**10.2**	9.52	**10.5**	5.08	8.45	9.00	9.09	**10.5**	7.94	8.94	**10.6**	**10.3**	9.75
Barium	**500**	P4	500	P4	500	RL/PL	-	348	236	267	164	181	-	**647**	232	291	105	274	214	409	451	288	459	232	380	**642**	**569**	329
Beryllium	**1-150**	AW/T	1-350	AW/T/PH	4		-	0.61	0.43	< 0.40	0.45	0.58	-	0.95	< 0.40	0.92	0.54	0.66	< 0.40	0.66	0.7	0.72	0.97	0.62	0.81	0.75	0.91	0.8
Bismuth							-	0.22	0.18	0.15	0.22	0.21	-	0.26	0.15	0.25	0.2	0.21	< 0.10	0.2	0.22	0.23	0.25	0.18	0.24	0.29	0.28	0.25
Boron	**15,000**	HH	1,000,000	HH	2	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	**1 - 30**	AW/T	1 - 50	AW/PH	1.4	AL	-	0.219	0.188	0.224	0.119	0.157	-	0.366	0.477	0.305	0.07	0.353	0.549	0.355	0.34	0.202	0.336	0.237	0.22	0.361	0.311	0.268
Calcium							-	1870	3730	4350	1180	911	-	2360	13000	1150	564	2700	19600	2320	3170	1470	2690	3670	1280	2480	2440	1500
Chromium (total)	**50**	P4	50	P4	64		-	15.5	12.9	10.3	16	17.3	-	21.1	14.4	22.1	17.1	20.7	13.2	14.5	17.5	19.8	22.2	16.1	18.6	20.8	20.5	20.1
Cobalt	**25**	P4	25	P4	40		-	10.1	5.76	5.62	5.52	6.26	-	15.2	5.43	9.97	6.4	12	6.12	10.6	14.1	8.97	12.9	12.5	11.6	**33**	**29.3**	8.54
Copper	**75 - 150**	AW/T	75 - 300	AW/T	63		-	23.2	10.2	12.2	12	16.8	-	28.1	12.5	29.2	12.3	18.2	12.6	25.2	28.6	24.7	31.6	15.8	29	35.4	34	29.5
Iron	**40,000**	P4	150,000	HH			-	23000	17800	14200	21000	20700	-	23900	17400	25400	24400	22700	19600	19900	23000	22900	25900	19600	23400	25600	25100	22500
Lead	**120**	I	120 - 1000	DW/T/PH	70	AL	-	12.7	13.9	13.5	15.7	13.2	-	15	14.1	14.8	13.5	16.8	9.85	13.1	16.5	14.1	16	14.5	14.9	18.5	17.4	15.8
Lithium	**65**	HH	450	HH			-	10.4	6.3	5.1	9.6	12.1	-	18.3	7.3	14.1	12.5	11.9	7	10.7	12.3	14.2	18	12.5	13.2	26.3	27.1	13.9
Magnesium							-	2190	1780	1400	1980	2010	-	2790	5090	3050	2090	2370	4410	2130	2730	2760	3370	3150	2540	2650	2740	2410
Manganese	**2000**	DW/T	2,000	DW/T			-	302	261	252	201	161	-	593	180	184	158	447	255	259	371	196	383	354	274	718	623	183
Mercury	**25**	I	75	T	6.6		-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	0.076	< 0.050	0.083	< 0.050	< 0.050	< 0.050	0.066	0.066	0.071	0.063	< 0.050	0.075	0.069	0.078	0.078
Molybdenum	**15**	DW	15	DW	5	AL	-	1.33	1.58	1.29	1.53	1.43	-	1.25	1.16	2.35	1.63	1.77	2.01	1.43	1.72	1.71	1.86	1.53	2.09	1.46	1.49	1.96
Nickel	**70 - 150**	DW/T/PH	70 - 250	DW/T/PH	45		-	22.6	8.87	9.25	9.43	15.7	-	43.8	11.9	27.6	11.5	17.3	18.2	30.8	31.2	21.5	41.1	18.1	27.7	50.2	45.7	23.3
Phosphorous							-	651	609	570	851	410	-	682	785	508	445	1230	998	689	589	509	605	435	494	619	638	704
Potassium							-	1740	1040	797	1250	1360	-	1810	1080	1450	1290	1810	898	1200	1200	1380	1430	1130	1180	1750	1650	1210
Selenium	**4**	P4	4	P4	1		-	0.61	< 0.50	< 0.50	< 0.50	0.52	-	0.64	< 0.50	< 0.50	< 0.50	0.61	< 0.50	< 0.50	< 0.50	0.66	1.13	< 0.50	0.63	0.78	0.74	0.71
Silver	**20**	EH	40	EH	20		-	0.113	0.171	0.269	0.182	0.122	-	0.154	0.328	0.099	< 0.050	0.458	0.221	0.203	0.162	0.09	0.183	0.079	0.068	0.227	0.231	0.111
Sodium (total)				T			-	394	126	123	287	< 100	-	< 100	< 100	580	2950	111	708	141	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Strontium	**20,000**	HH	150,000	HH			-	34.5	39.6	48.8	13.6	16	-	37.5	23	26.7	14	23.2	35.7	31.9	30.1	26.2	40.1	20.5	28.2	50.5	47	27.6
Thallium	**2**	DW/AW/I	2	DW/AW/I	1		-	0.125	0.166	0.143	0.162	0.156	-	0.224	0.182	0.225	0.175	0.252	0.18	0.174	0.188	0.174	0.252	0.177	0.207	0.227	0.225	0.207
Tin	**50**	EH	300	EH	5	AL	-	0.46	1	1.5	0.46	0.48	-	0.59	0.69	0.62	0.45	0.53	0.4	0.45	0.54	0.55	0.65	0.48	0.57	0.62	0.6	0.63
Titanium							-	14.1	33.9	27.4	30	14.4	-	15.9	94.4	23.7	27	24.1	40.7	14.2	14	20	24.5	27.7	15.6	19.4	17.1	17.8
Uranium	**30**	DW	30	DW	23		-	1.36	0.604	0.574	0.752	0.793	-	1.39	0.793	1.38	0.654	1.26	0.788	1.02	1.21	1.21	1.28	0.962	1.22	0.937	1.01	1.37
Vanadium	**100**	DW	100	DW	130		-	26.6	44.2	33.4	44.3	36.2	-	40	53.9	41.4	40.9	50	31	26.4	30.1	34.7	42.4	32.1	33.5	33.2	32.9	36.3
Zinc	**150 - 450**	AW/T/pH	150 - 450	AW/T/pH	200		-	102	59.3	71.8	45.5	74.8	-	141	65.3	108	58.9	60.4	58.5	96.8	98.6	85.9	131	72.2	92.5	135	143	102
Zirconium							-	1.7	< 0.50	1.55	< 0.50	0.77	-	2.68	< 0.50	3.62	0.93	< 0.50	< 0.50	2.65	2.58	1.55	4.07	< 0.50	2.63	3.27	3.73	3.01

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs= metres below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

pH = Standard is pH dependant

P4 = BC MoE Protocol 4 For Contaminated Sites

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

Table 12
Results of Soil Analyses - Metals and Inorganics
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_{R} (< 3m) $Stage10_3$	Notes	BC CSR Standards for IL (> 3m) $Stage\ 10_3$	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-TP17-33	K19-TP17-34	K19-TP17-35	K19-TP17-36	K19-TP17-37	K19-TP17-38	K19-TP17-39	K19-TP17-40	K19-TP17-41	K19-TP17-41	K19-TP17-42	K19-TP17-43	K19-TP17-44	K19-TP17-45	K19-TP17-45	K19-TP17-46	K19-TP17-47	K19-TP17-48	K19-TP17-49	K19-TP17-50	K19-MW17-01	K19-BH17-03	K19-BH17-03
Sample Control Number							03362-01	03362-06	03362-11	03358-03	03358-08	03359-03	03364-10	03365-05	03363-07	03363-08	03363-12	03364-05	03365-10	06685-01	06685-02	06685-07	06686-01	06686-06	06688-02	06688-07	03360-01	06696-08	06697-01
Laboratory Report Number							B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132
Date Sampled							27-Jan-17	27-Jan-17	28-Jan-17	28-Jan-17	28-Jan-17	28-Jan-17	29-Jan-17	29-Jan-17	28-Jan-17	28-Jan-17	28-Jan-17	28-Jan-17	29-Jan-17	30-Jan-17	30-Jan-17	30-Jan-17	30-Jan-17	30-Jan-17	30-Jan-17	30-Jan-17	30-Jan-17	31-Jan-17	31-Jan-17
Depth of Sample (m bgs)							0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	2.6	2.6	1.6	0.6	0.7	0.6	0.6	0.7	0.6	0.7	1.4	0.6	0.5	0.5	**4.5**
QA/QC															FDA	FD				FDA	FD								
APEC																													
Physical Tests																													
pH					6 to 8		4.89	4.71	5.22	4.67	4.94	5.07	5	4.71	7.1	7.26	5.33	4.83	5.01	5.18	5.18	4.92	5.02	5.25	5.39	6.06	5.6	4.94	6.87
pH (soluble)					6 to 8		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inorganic Compounds																													
Chloride (ion)	**100**	DW	100	DW			4.5	5.3	6.9	7.8	4.1	13.2	6.2	5.8	10.7	7.2	7.7	5.3	5.7	4.6	6.8	<3.4	<3.0	18.6	7.5	2.5	5.3	<3.9	8
Sodium (ion)	**200**	T	1000	T			8.4	9.7	6.7	10.9	9.7	14.3	14.9	8.9	11.3	9.2	9	10.4	7.8	7.2	9.5	5.9	4.3	9.2	6.6	3	20.5	< 3.9	11.1
Metals																													
Aluminum	**40,000**	HH	250,000	HH			9240	10400	7220	9300	8920	10100	10700	11200	8250	8350	11700	10900	10500	11300	11200	13200	13900	6180	15800	5490	11100	10500	12200
Antimony	**20**	EH	40	EH	20		0.54	0.61	0.37	0.5	0.45	0.55	0.58	0.61	0.37	0.37	0.76	0.53	0.63	0.26	0.25	0.57	0.59	0.33	0.65	0.39	0.37	0.53	0.32
Arsenic	**10**	P4	10	P4	12		8.25	10	7.71	8.4	8.32	8.72	8.45	9.85	**14.6**	**13.7**	9.56	9.43	9.4	7.08	7.13	9.75	9.87	8.89	**12.2**	7.19	9.63	8.61	9.42
Barium	**500**	P4	500	P4	500	RL/PL	249	257	123	412	173	382	375	225	479	458	404	301	350	270	256	347	351	123	448	264	194	238	307
Beryllium	**1-150**	AW/T	1-350	AW/T/PH	4		0.56	1.18	< 0.40	0.75	0.57	0.81	0.81	0.69	< 0.40	0.45	0.99	0.75	0.77	0.61	0.71	0.99	0.96	< 0.40	**1.24**	0.7	0.69	0.83	1.01
Bismuth							0.22	0.26	0.19	0.23	0.19	0.23	0.25	0.22	0.33	0.33	0.23	0.25	0.22	0.2	0.18	0.24	0.25	0.15	0.26	0.12	0.22	0.2	0.32
Boron	**15,000**	HH	1,000,000	HH	2	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	**1 - 30**	AW/T	1 - 50	AW/PH	1.4	AL	0.14	0.399	0.156	0.216	0.13	0.191	0.173	0.195	0.167	0.136	0.272	0.166	0.224	0.733	0.718	0.265	0.207	0.194	0.339	0.258	0.228	0.151	0.484
Calcium							1190	1360	945	1480	763	1830	1310	1070	2750	2560	2650	916	2220	1810	1750	2020	1660	921	2800	1330	2020	938	2610
Chromium (total)	**50**	P4	50	P4	64		16.5	19.8	14.4	16.8	16.9	18.7	19.9	22.1	20.8	19.3	22.5	19.7	19.8	21.4	20.6	23.7	23.6	14	28.5	11	21.3	22.6	20.8
Cobalt	**25**	P4	25	P4	40		9.53	7.8	6.07	6.73	7.6	12.6	7.7	9.58	6.69	6.95	9.15	9.88	9.62	4.21	4.01	10.3	7.75	7.77	16.1	19.3	8.97	10.3	19.7
Copper	**75 - 150**	AW/T	75 - 300	AW/T	63		22.3	28.2	10.7	25.5	16.4	27.6	26	26.8	33.1	29	27.4	25.1	27.6	19.5	19.3	28.1	26.4	6.24	35	15.5	16	22.2	32.8
Iron	**40,000**	P4	150,000	HH			21900	22700	17200	21400	21500	22100	23600	23000	35300	32000	22800	21900	21400	18400	20000	24000	24400	15600	29200	27200	22400	31100	28100
Lead	**120**	I	120 - 1000	DW/T/PH	70	AL	14.4	15.3	13.8	13.5	13.5	14.7	14.7	15.6	27.6	24	17.3	16.2	14.7	14.1	13.3	16	15.9	12.2	17.5	10.2	15.5	14	19.8
Lithium	**65**	HH	450	HH			12.5	14.6	8.8	12.4	14	12.2	13.6	14.2	15.3	17	15.9	13.8	14.1	13	11.7	17.4	17.2	9.8	18.6	6.9	11.9	13.3	37.7
Magnesium							1940	2500	2000	2160	2570	2610	2110	2640	2250	2200	2680	2030	2550	2170	2160	3300	2950	1730	3940	1290	2300	2260	3710
Manganese	**2000**	DW/T	2,000	DW/T			229	164	158	142	199	349	188	188	112	112	204	237	202	83.6	82	263	179	175	391	625	415	626	185
Mercury	**25**	I	75	T	6.6		0.061	0.069	< 0.050	0.062	< 0.050	0.066	0.069	0.069	0.072	0.073	0.08	0.062	0.065	< 0.050	< 0.050	0.072	0.067	< 0.050	0.083	< 0.050	< 0.050	0.054	0.065
Molybdenum	**15**	DW	15	DW	5	AL	1.5	1.82	1.36	1.41	1.6	1.74	1.51	1.8	0.89	0.81	1.56	1.64	1.76	1.17	1.15	1.85	1.5	1.57	2.75	1.25	1.99	1.81	0.79
Nickel	**70 - 150**	DW/T/PH	70 - 250	DW/T/PH	45		21.1	23.5	12.2	21.7	17.9	29.2	24.6	24	26.6	24.5	26.2	21.2	24.7	18.6	17.9	27.2	23.2	9.01	44.8	44.6	13	19.8	55.3
Phosphorous							442	594	425	602	354	607	554	496	762	674	623	502	529	1210	1260	593	538	289	695	702	685	458	492
Potassium							1090	1220	923	1080	1010	1210	1390	1430	2010	1970	1420	1340	1250	1450	1450	1890	1830	874	2090	1260	1520	1210	2140
Selenium	**4**	P4	4	P4	1		0.62	1.17	< 0.50	0.57	< 0.50	< 0.50	< 0.50	< 0.50	0.82	0.64	0.51	0.54	0.51	0.61	0.59	0.72	0.65	< 0.50	0.83	0.61	< 0.50	0.64	1.11
Silver	**20**	EH	40	EH	20		0.058	0.103	0.147	0.123	0.075	0.161	0.093	0.074	0.2	0.215	0.151	0.062	0.125	0.463	0.428	0.134	0.091	0.091	0.264	0.109	0.218	0.093	0.188
Sodium (total)				T			< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	175	270	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	112	< 100	< 100
Strontium	**20,000**	HH	150,000	HH			22.3	26.1	12.8	29.5	18.2	28.2	30.3	26.1	76.9	82.9	55.4	20.9	30.7	22.8	22.7	32.5	29	13.6	40.7	20	21.1	19.6	35.5
Thallium	**2**	DW/AW/I	2	DW/AW/I	1		0.15	0.206	0.156	0.182	0.177	0.177	0.19	0.213	0.161	0.173	0.228	0.173	0.189	0.22	0.224	0.209	0.207	0.125	0.318	0.139	0.196	0.165	0.108
Tin	**50**	EH	300	EH	5	AL	0.5	0.58	0.39	0.49	0.44	0.56	0.58	0.56	0.57	0.62	0.94	0.54	0.72	0.57	0.54	0.61	0.62	0.33	0.74	0.29	0.55	0.52	0.64
Titanium							15.7	21.6	40.1	11.6	24.3	17.9	16.4	25.9	10	11	25.1	12.9	14.8	16.9	23.6	26.2	20.6	46.5	38.5	11.1	34.3	19.7	17
Uranium	**30**	DW	30	DW	23		1.09	1.37	0.542	1.06	0.928	1.3	1.23	1.39	1.49	1.08	1.2	1.1	1.23	1.51	1.45	1.24	1.22	0.52	1.52	1.26	0.857	1.16	0.985
Vanadium	**100**	DW	100	DW	130		31.2	35.6	38.3	30.4	32.7	33.3	40.2	40.9	28	27.1	43.9	38.4	37.7	41	40.2	44	44	34.6	54.3	25.8	56.4	36	28
Zinc	**150 - 450**	AW/T/pH	150 - 450	AW/T/pH	200		74.5	97.5	55.8	85	76.6	94.1	86.8	93.2	115	101	**188**	83.7	91.6	48.1	45.9	100	95.8	46.4	129	86.1	60.9	78.3	204
Zirconium							2.12	3.02	0.57	2.08	0.68	< 0.50	2.83	2.78	2.54	2.36	2.25	2	3.17	< 0.50	< 0.50	2.64	2.29	0.6	5	2.42	< 0.50	2.31	3.39

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs= metres below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

pH = Standard is pH dependant

P4 = BC MoE Protocol 4 For Contaminated Sites

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

Table 12
Results of Soil Analyses - Metals and Inorganics
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_{LR} (< 3m) Stage10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-MW17-05	K19-MW17-06	K19-MW17-06	K19-MW17-06	K19-MW17-07	K19-BH17-09	K19-MW17-10	K19-MW17-11	K19-MW17-13	K19-MW17-13	K19-BH17-14	K19-BH17-14	K19-BH17-15	K19-HA17-01	K19-HA17-01	K19-HA17-02	K19-HA17-03	K19-HA17-04	K19-HA17-04	K19-HA17-05
Sample Control Number							06697-10	06698-07	06698-10	06698-11	06699-07	06700-11	06701-06	06702-03	06703-07	06703-08	06704-06	06704-07	06705-01							
Laboratory Report Number							B709132	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710365	B710365	B710365	03811-01 17N240971	03811-04 17N240971	03811-02 17N240971	03811-03 17N240971	03811-05 17N240971	03811-06 17N240971	03811-07 17N240971
Date Sampled							1-Feb-17	2-Feb-17	2-Feb-17	2-Feb-17	3-Feb-17	4-Feb-17	4-Feb-17	5-Feb-17	6-Feb-17	6-Feb-17	7-Feb-17	7-Feb-17	7-Feb-17	17-Jul-17	17-Jul-17	17-Jul-17	17-Jul-17	17-Jul-17	17-Jul-17	17-Jul-17
Depth of Sample (m bgs)							0.5	0.5	**3.5** FDA	**3.5** FD	0.5	0.5	0.5	1.4	0.5	1.4	2.5 FDA	2.5 FD	1.4	0.2-0.3	0.4-0.6	0.45-0.65	0.25-0.4	0.4-0.6 FDA	0.4-0.6 FD	0.2-0.3
QA/QC																				1a	1a	1a	1a	1a	1a	1a
APEC																										
Physical Tests																										
pH					6 to 8		5.63	4.89	-	-	5.84	5.12	4.94	4.85	-	5.09	6.14	5.32	6.18	7.92	-	-	-	-	-	-
pH (soluble)					6 to 8		-																			
Inorganic Compounds																										
Chloride (ion)	**100**	DW	100	DW			5.7	13.2	38.1	41.7	5.6	5.2	13.8	4.5	7.4	14.6	< 3.0	2.9	5.8	6	46	3	3	**103**	**156**	40
Sodium (ion)	**200**	T	1000	T			8.6	11	12.3	14.4	8.5	6.9	9.6	5.1	7.7	11.3	7.2	7.4	8.6	9	48	< 2	18	68	100	34
Metals																										
Aluminum	**40,000**	HH	250,000	HH			11300	10500	-	-	6800	10500	6490	7460	-	10300	4590	5070	11500	4990	-	-	-	-	-	-
Antimony	**20**	EH	40	EH	20		0.5	0.49	-	-	0.32	0.52	0.4	0.38	-	0.48	0.4	0.41	0.6	0.4	-	-	-	-	-	-
Arsenic	**10**	P4	10	P4	12		9.12	6.52	-	-	7.88	6.84	5.31	6.9	-	7.28	4.55	5.11	9.16	4.8	-	-	-	-	-	-
Barium	**500**	P4	500	P4	500	RL/PL	256	234	-	-	128	241	136	260	-	419	212	277	396	257	-	-	-	-	-	-
Beryllium	**1-150**	AW/T	1-350	AW/T/PH	4		0.83	0.8	-	-	0.5	0.91	0.46	0.54	-	0.87	< 0.40	< 0.40	0.85	0.4	-	-	-	-	-	-
Bismuth							0.21	0.18	-	-	0.15	0.21	0.14	0.19	-	0.21	0.14	0.15	0.24	< 0.5	-	-	-	-	-	-
Boron	**15,000**	HH	1,000,000	HH	2	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	**1 - 30**	AW/T	1 - 50	AW/PH	1.4	AL	0.204	0.165	-	-	0.109	0.173	0.126	0.2	-	0.214	0.104	0.095	0.302	0.4	-	-	-	-	-	-
Calcium							1840	772	-	-	1230	1650	939	1430	-	1930	1690	1390	3530	14400	-	-	-	-	-	-
Chromium (total)	**50**	P4	50	P4	64		20.8	17.3	-	-	11.8	17.6	11.4	12.5	-	17.6	8.2	9.2	20.2	12	-	-	-	-	-	-
Cobalt	**25**	P4	25	P4	40		13.1	7.34	-	-	7.85	11.8	4.78	7.1	-	12.4	2.41	2.36	10.9	4.5	-	-	-	-	-	-
Copper	**75 - 150**	AW/T	75 - 300	AW/T	63		21.3	20.5	-	-	9.52	22.9	13.8	19.5	-	22.1	11.8	13.6	28	12.9	-	-	-	-	-	-
Iron	**40,000**	P4	150,000	HH			38700	18700	-	-	21200	22900	16400	19800	-	19600	12000	13600	24700	20100	-	-	-	-	-	-
Lead	**120**	I	120 - 1000	DW/T/PH	70	AL	14.8	11.2	-	-	11.3	12.9	9.13	10.8	-	13.2	8.37	8.42	14.8	6.8	-	-	-	-	-	-
Lithium	**65**	HH	450	HH			13.6	10.7	-	-	9.4	13.7	8.5	9.1	-	13.4	< 5.0	5	15.1	7	-	-	-	-	-	-
Magnesium							2450	2190	-	-	1540	2470	1460	2030	-	2530	1140	1250	3390	5380	-	-	-	-	-	-
Manganese	**2000**	DW/T	2,000	DW/T			660	181	-	-	299	285	110	192	-	342	31.2	32.4	231	176	-	-	-	-	-	-
Mercury	**25**	I	75	T	6.6		< 0.050	0.052	-	-	< 0.050	0.059	< 0.050	< 0.050	-	0.053	< 0.050	< 0.050	0.071	0.03	-	-	-	-	-	-
Molybdenum	**15**	DW	15	DW	5	AL	1.92	1.36	-	-	1.21	1.6	1.03	1.22	-	1.31	0.8	0.91	1.86	1.1	-	-	-	-	-	-
Nickel	**70 - 150**	DW/T/PH	70 - 250	DW/T/PH	45		24.3	17.9	-	-	10.2	25.9	11.2	20.4	-	28.1	7.08	7.51	34.7	18.1	-	-	-	-	-	-
Phosphorous							885	376	-	-	425	536	507	456	-	548	781	776	741	726	-	-	-	-	-	-
Potassium							1590	1280	-	-	923	1510	943	1060	-	1490	1420	1670	1830	902	-	-	-	-	-	-
Selenium	**4**	P4	4	P4	1		0.78	0.51	-	-	0.54	0.67	0.53	0.58	-	0.64	< 0.50	< 0.50	0.67	0.5	-	-	-	-	-	-
Silver	**20**	EH	40	EH	20		0.238	0.068	-	-	< 0.050	0.11	0.075	0.099	-	0.133	0.142	0.187	0.256	< 0.5	-	-	-	-	-	-
Sodium (total)				T			< 100	< 100	-	-	< 100	< 100	< 100	< 100	-	< 100	< 100	< 100	< 100	70	-	-	-	-	-	-
Strontium	**20,000**	HH	150,000	HH			23.1	18.4	-	-	11.5	24.4	15.8	20.2	-	28.5	28.5	41.5	42.4	25	-	-	-	-	-	-
Thallium	**2**	DW/AW/I	2	DW/AW/I	1		0.201	0.168	-	-	0.109	0.166	0.108	0.127	-	0.198	0.111	0.133	0.235	0.1	-	-	-	-	-	-
Tin	**50**	EH	300	EH	5	AL	0.54	0.44	-	-	0.35	0.51	0.29	0.39	-	0.46	0.25	0.29	0.55	0.3	-	-	-	-	-	-
Titanium							23.8	19.7	-	-	14.7	21.8	12.9	12.4	-	16.5	8.7	8.9	27.3	61	-	-	-	-	-	-
Uranium	**30**	DW	30	DW	23		1.02	0.9	-	-	0.482	1.11	0.716	0.981	-	0.973	1.2	1.13	1.2	0.6	-	-	-	-	-	-
Vanadium	**100**	DW	100	DW	130		47.6	34.6	-	-	26.8	33.6	22.1	23	-	32.6	18.2	20.1	37.8	34	-	-	-	-	-	-
Zinc	**150 - 450**	AW/T/pH	150 - 450	AW/T/pH	200		82.7	67.4	-	-	43.2	83.9	50	73.8	-	83.8	32	34.4	110	57	-	-	-	-	-	-
Zirconium							< 0.50	1.72	-	-	0.59	2.09	1.25	1.57	-	2.46	2.18	2.09	3.99	1	-	-	-	-	-	-

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K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_{ft} (< 3m) Stage10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-HA17-06	K19-HA17-07	K19-HA17-08	K19-HA17-09	K19-HA17-10	K19-HD17-01	K19-HD17-02	K19-HD17-03	K19-HD17-04	K19-HD17-05	K19-HD17-06	K19-HD17-07	K19-MW17-18	K19-MW17-18	K19-MW17-18	K19-MW17-19	K19-MW17-20	K19-MW17-23	K19-MW17-24
Sample Control Number							03845-01	03606-01	03606-02	04263-01	04263-04	03776-01	03776-02	03776-03	03776-04	03776-05	03776-06	03776-07	03831-07	03831-08	03813-09	03832-05	03833-01	03834-11	03835-08
Laboratory Report Number							17N243343	17N244304	17N244304	17N271535	17N271535	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N240971	17N240971	17N240971	17N240971	17N242036	17N242036	17N242036
Date Sampled							23-Jul-17	29-Jul-17	30-Jul-17	11-Oct-17	11-Oct-17	16-Jul-17	16-Jul-17	16-Jul-17	16-Jul-17	16-Jul-17	16-Jul-17	16-Jul-17	19-Jul-17	19-Jul-17	18-Jul-17	19-Jul-17	20-Jul-17	21-Jul-17	22-Jul-17
Depth of Sample (m bgs)							0.5-0.6	0.35-0.5	0.3-0.45	0.05 - 0.45	1 - 1.5	0.4-0.4	0.4-0.4	0.35-0.35	0.4-0.4	0.4-0.4	0.4-0.4	0.3-0.3	0.3-0.5	0.3-0.5	1.5-1.8	0.3-0.5	0.3-0.5	0.3-0.5	0.3-0.5
QA/QC																			FDA	FD					
APEC							10a	background	10a	9	9	1d	1d	1d	1d	6	6	6	24	24	24	27	6	18	17
Physical Tests																									
pH					6 to 8		6.99	4.99	6.34	4.36	4.45	6.78	7.56	7.6	7.86	7.45	4.61	7.98	5.26	5.07	5.32	5.41	7.74	5.72	5.5
pH (soluble)					6 to 8																				
Inorganic Compounds																									
Chloride (ion)	**100**	DW	100	DW			-	3	4	-	-	2	-	-	3	-	-	2	3	3	-	< 2	4	< 2	< 2
Sodium (ion)	**200**	T	1000	T			-	< 2	5	-	-	< 2	-	-	< 2	-	-	< 2	3	3	-	5	14	3	< 2
Metals																									
Aluminum	**40,000**	HH	250,000	HH			16300	13800	17700	11200	12700	13500	7980	9340	5900	7660	18400	6300	12300	13100	14200	7150	7800	11600	13000
Antimony	**20**	EH	40	EH	20		0.6	0.5	0.4	0.3	0.4	0.4	1.2	0.5	0.3	0.4	0.7	0.2	0.6	0.6	0.5	0.4	0.5	0.5	0.5
Arsenic	**10**	P4	10	P4	12		9.2	9.4	8.4	6.4	9.5	9.8	**12.4**	8.2	6.5	7.8	**11.3**	5.3	9.4	**10.5**	8.2	6.1	8.3	**11.4**	**11.1**
Barium	**500**	P4	500	P4	500	RL/PL	**559**	326	**731**	366	202	379	**589**	326	338	239	284	282	203	199	302	307	204	208	318
Beryllium	**1-150**	AW/T	1-350	AW/T/PH	4		0.9	0.8	0.9	0.6	0.6	0.8	0.6	0.6	0.5	0.5	0.8	0.4	0.6	0.7	0.7	0.5	0.4	0.7	0.9
Bismuth							< 0.5	< 0.5	< 0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Boron	**15,000**	HH	1,000,000	HH	2	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	**1 - 30**	AW/T	1 - 50	AW/PH	1.4	AL	0.7	0.18	0.86	0.51	0.21	0.36	1.12	0.51	0.48	0.44	0.54	0.41	**1.06**	0.69	0.2	0.12	0.32	0.15	0.22
Calcium							6640	1900	7230	2540	1040	5110	15200	9300	18000	10400	2030	27400	1640	1440	2760	1610	14500	1900	2030
Chromium (total)	**50**	P4	50	P4	64		22	21	23	19	21	22	19	20	13	15	27	14	25	27	23	13	15	22	21
Cobalt	**25**	P4	25	P4	40		10.2	13.6	8.6	5.9	10.7	11.4	9.2	6.6	6.3	6.7	9	4.8	9.1	9	6.5	5.2	6.3	12.6	14.3
Copper	**75 - 150**	AW/T	75 - 300	AW/T	63		21.6	23.2	20.9	19.0	16.8	20.1	26.9	15.4	13.2	14.5	25.8	10.6	18.3	19.7	19.4	14.2	11.4	22	27.2
Iron	**40,000**	P4	150,000	HH			30200	25000	28300	26900	24500	23600	**41000**	22600	29700	25400	31200	21900	22300	23300	25200	18900	23200	23700	25600
Lead	**120**	I	120 - 1000	DW/T/PH	70	AL	11.7	13	12.4	27.5	14.6	17.4	74	29.6	8.5	8.5	21.7	6.2	20	19.2	12.3	7.7	9.4	14.5	14.7
Lithium	**65**	HH	450	HH			31.4	15.9	32.8	6.1	12.6	16.7	9.7	10.6	8.1	9.1	17.1	7.5	16.5	17.8	15.5	8.1	8.8	14.2	15
Magnesium							3700	2980	3690	1730	2740	3250	3420	3680	6380	4870	3920	9860	2800	2920	3530	1770	4670	2810	3010
Manganese	**2000**	DW/T	2,000	DW/T			296	321	365	277	348	283	340	238	289	245	184	230	223	238	138	181	244	380	486
Mercury	**25**	I	75	T	6.6		0.07	0.05	0.05	0.04	0.03	0.04	0.04	0.04	0.03	0.04	0.05	0.03	0.03	0.03	0.03	0.02	0.02	0.04	0.05
Molybdenum	**15**	DW	15	DW	5	AL	1.3	1.5	1.2	2.3	1.7	1.9	2.8	2.1	1.5	1.4	1.8	1.3	1.7	1.8	1.5	1.1	1.4	2	2
Nickel	**70 - 150**	DW/T/PH	70 - 250	DW/T/PH	45		27.9	23	27.8	16.8	18.0	23.3	34.1	21.3	21.8	21.1	24.1	16	20.5	22.5	19.9	16.8	16.1	20.9	30.8
Phosphorous							666	692	1040	920	608	675	1400	1110	1120	1110	619	1190	325	330	398	511	789	533	546
Potassium							2230	1960	2250	1740	1740	1750	1310	1270	1180	1380	2770	1250	1580	1580	1600	1200	1200	1470	1600
Selenium	**4**	P4	4	P4	1		1.2	1.0	1.1	0.4	0.7	1.3	0.8	0.9	0.5	0.3	0.4	0.6	0.6	0.7	0.6	0.7	0.5	0.8	0.9
Silver	**20**	EH	40	EH	20		< 0.5	< 0.5	< 0.5	0.6	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Sodium (total)				T			113	90	95	39	43	36	22	< 5	17	15	54	38	71	69	76	119	107	68	73
Strontium	**20,000**	HH	150,000	HH			45	24	45	21	20	35	56	33	42	29	37	45	25	26	24	29	32	24	34
Thallium	**2**	DW/AW/I	2	DW/AW/I	1		0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.2
Tin	**50**	EH	300	EH	5	AL	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	1	0.3	0.8	0.3	0.7	0.7	0.5	0.3	0.4	0.5	0.5
Titanium							97	100	71	30	40	107	44	53	71	89	133	121	122	109	118	85	95	93	71
Uranium	**30**	DW	30	DW	23		1	1.1	2.4	0.6	0.6	2.4	1.2	1.2	0.8	0.8	1.2	0.8	0.8	1	1.2	1.2	0.7	1.3	1.4
Vanadium	**100**	DW	100	DW	130		44	42	50	47	47	50	42	52	43	32	53	28	51	53	45	25	33	42	37
Zinc	**150 - 450**	AW/T/pH	150 - 450	AW/T/pH	200		80	95	105	73	94	78	155	85	71	76	**237**	54	**248**	**212**	64	53	65	82	114
Zirconium							1.9	0.8	1	0.4	0.4	0.7	1	0.6	0.6	1	3.3	1.3	1.4	1	1.9	2.5	0.8	1.2	2.7

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs= metres below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

pH = Standard is pH dependant

P4 = BC MoE Protocol 4 For Contaminated Sites

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

Table 12
Results of Soil Analyses - Metals and Inorganics
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_R (< 3m) Stage10$_3$	Notes	BC CSR Standards for IL (> 3m) Stage 10$_3$	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-MW17-25	K19-MW17-26	K19-MW17-27	K19-MW17-28	K19-MW17-28	K19-MW17-30	K19-MW17-31	K19-MW17-32	K19-MW17-33	K19-MW17-34	K19-MW17-35	K19-MW17-35	K19-TP17-52	K19-TP17-52	K19-TP17-53	K19-TP17-54	K19-TP17-55	K19-TP17-56
Sample Control Number							03836-01	03836-06	03837-02	03837-09	03837-10	03838-11	03839-05	03839-11	03846-03	03846-07	03847-02	03847-03	03796-06	03796-07	03796-11	03820-03	03820-08	03821-01
Laboratory Report Number							17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668
Date Sampled							22-Jul-17	22-Jul-17	23-Jul-17	23-Jul-17	23-Jul-17	25-Jul-17	26-Jul-17	26-Jul-17	26-Jul-17	27-Jul-17	27-Jul-17	27-Jul-17	14-Jul-17	14-Jul-17	14-Jul-17	14-Jul-17	14-Jul-17	15-Jul-17
Depth of Sample (m bgs)							0.3-0.5	0.3-0.5	0.3-0.5	0.3-0.5	0.3-0.5	0.3-0.5	0.3-0.5	0.3-0.5	0.3-0.5	0.3-0.5	1-1.5	1-1.5	0.8	0.8	0.8	0.7	0.5	0.6
QA/QC										FDA	FD						FDA	FD	FDA	FD				
APEC							16	19	20	4	4	12	11	1d	14	15	1b	1b	1e	1e	1e	23a	4	4
Physical Tests																								
pH					6 to 8		5.16	5.32	5.27	5.62	5.57	5.19	6.39	7.99	6.34	7.12	6.99	7.23	6.23	6.14	4.8	5.46	5.43	5.12
pH (soluble)					6 to 8																			
Inorganic Compounds																								
Chloride (ion)	**100**	DW	100	DW			14	< 2	7	20	14	7	< 2	3	< 2	2	12	11	-	-	-	-	-	-
Sodium (ion)	**200**	T	1000	T			6	< 2	6	15	12	4	2	4	< 2	< 2	5	4	-	-	-	-	-	-
Metals																								
Aluminum	**40,000**	HH	250,000	HH			8950	14000	14400	12500	12200	20500	14700	8860	9580	10100	7890	13000	26700	29300	15200	11100	17100	13400
Antimony	**20**	EH	40	EH	20		0.6	0.8	0.5	0.6	0.6	0.7	0.6	0.6	0.6	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.3
Arsenic	**10**	P4	10	P4	12		9	**13.2**	9.5	**11.3**	**11.2**	**11.7**	**13.9**	**10.5**	**12.0**	**11.0**	7.5	**13.7**	**11.0**	**11.1**	9.2	**10.4**	**10.4**	8.2
Barium	**500**	P4	500	P4	500	RL/PL	187	288	446	**695**	**837**	373	476	371	164	466	152	193	**689**	**811**	316	402	291	257
Beryllium	**1-150**	AW/T	1-350	AW/T/PH	4		0.5	0.8	0.9	0.9	0.8	1	0.9	0.6	0.5	0.6	0.4	0.5	1.5	1.8	0.8	0.7	1.0	0.6
Bismuth							< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Boron	**15,000**	HH	1,000,000	HH	2	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	**1 - 30**	AW/T	1 - 50	AW/PH	1.4	AL	0.12	0.17	0.13	0.21	0.19	0.19	0.41	0.26	0.19	0.16	0.22	0.27	**1.06**	**1.45**	0.16	0.09	0.17	0.12
Calcium							907	1730	1480	1720	1630	3950	3480	9720	2490	3590	9000	18500	8040	8010	2130	1100	1800	1400
Chromium (total)	**50**	P4	50	P4	64		16	25	22	24	25	26	26	16	16	16	13	16	35	39	23	18	27	20
Cobalt	**25**	P4	25	P4	40		8	12.4	11.3	12.7	13	8.6	17.7	7.7	8.5	7.2	5.7	7.7	8.5	8.9	7.8	6.5	10.4	6.2
Copper	**75 - 150**	AW/T	75 - 300	AW/T	63		16	24.2	26.4	26.1	25.7	26.4	31.7	22.2	14.8	19	14	24.9	29.1	32.8	23.4	24.5	27.6	16.3
Iron	**40,000**	P4	150,000	HH			18400	26100	26100	23400	23400	34100	24800	19800	20700	29100	17300	32300	32000	33300	24200	22700	27400	21500
Lead	**120**	I	120 - 1000	DW/T/PH	70	AL	11.1	14.3	13.1	13.9	13.6	12	13.9	14.9	13	11.5	13.3	13.9	18.4	19.4	12.9	13	14.1	13.1
Lithium	**65**	HH	450	HH			11	16.3	14.5	16.3	16.1	14	15.9	9.9	10.1	10.3	6.6	8.3	27.6	33	16.4	11.4	18	12.1
Magnesium							2100	3500	3120	2920	2870	4500	3990	3450	2380	2730	2220	7070	3750	3670	3300	2230	3690	2890
Manganese	**2000**	DW/T	2,000	DW/T			249	309	274	372	305	199	746	280	304	278	219	342	223	204	180	116	298	178
Mercury	**25**	I	75	T	6.6		0.04	0.04	0.03	0.04	0.04	0.06	0.06	0.03	0.03	0.03	0.03	0.04	0.06	0.07	0.05	0.02	0.06	0.02
Molybdenum	**15**	DW	15	DW	5	AL	1.3	2.2	1.1	1.6	1.6	1.9	1.8	1.8	1.2	1	1.3	1.4	1.8	1.8	1.5	1.1	1.6	1.4
Nickel	**70 - 150**	DW/T/PH	70 - 250	DW/T/PH	45		15	22.5	21.3	30.3	28.6	25.8	43.1	26.2	17.9	22.8	12.3	18.4	47.9	58.1	23.7	18.2	29.7	16
Phosphorous							476	560	415	486	497	1520	635	640	556	711	539	937	1520	1710	567	546	498	540
Potassium							1230	2120	2180	1910	2000	2570	1830	1170	1280	1350	1030	1710	2870	2860	2290	2140	2110	2050
Selenium	**4**	P4	4	P4	1		0.8	0.7	0.9	0.9	0.7	0.8	0.9	0.9	0.6	0.6	0.5	0.6	1.5	1.8	0.9	0.7	1.2	0.4
Silver	**20**	EH	40	EH	20		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.6	0.8	< 0.5	< 0.5	< 0.5	< 0.5
Sodium (total)				T			61	99	111	188	190	119	71	64	42	52	47	82	469	510	140	309	395	100
Strontium	**20,000**	HH	150,000	HH			16	27	22	35	36	33	43	31	19	20	23	22	51	54	34	37	35	25
Thallium	**2**	DW/AW/I	2	DW/AW/I	1		0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.4	0.4	0.2	0.2	0.3	0.2
Tin	**50**	EH	300	EH	5	AL	0.5	0.7	0.7	0.8	1.1	0.7	0.7	0.4	0.4	0.4	0.4	0.5	0.8	0.9	0.6	0.5	0.6	0.5
Titanium							126	150	160	105	109	132	42	18	21	22	30	54	122	90	130	158	123	173
Uranium	**30**	DW	30	DW	23		1.1	1.3	1.4	1.4	1.5	2	1.2	1.1	0.7	0.8	0.7	0.8	3.9	4.9	1.2	1.6	1.4	1
Vanadium	**100**	DW	100	DW	130		31	47	36	44	44	49	49	32	32	31	31	38	75	83	43	32	52	44
Zinc	**150 - 450**	AW/T/pH	150 - 450	AW/T/pH	200		64	97	87	100	96	93	119	105	83	81	57	91	107	117	90	77	100	63
Zirconium							1.3	1.6	1.7	1.7	1.6	2.8	3.4	2	0.6	0.8	0.4	0.3	1.3	1.3	3.9	2	3.5	0.5

Notes:

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23	Exceeds CCME RL/PL & AL standard

Table 12
Results of Soil Analyses - Metals and Inorganics
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-TP17-57	K19-TP17-57	K19-TP17-58	K19-TP17-59	K19-TP17-59	K19-TP17-60	K19-TP17-61	K19-TP17-62	K19-TP17-62	K19-TP17-63	K19-TP17-64	K19-TP17-65	K19-TP17-65	K19-TP17-66	K19-TP17-67	K19-TP17-68	K19-TP17-72	K19-TP17-73
Sample Control Number	**BC CSR Standards for WL_{ss} (< 3m) $Stage10_3$**	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	03821-05	03843-05	03821-10	03822-02	03822-03	03822-07	03822-12	03823-05	03823-06	03823-11	03824-03	03824-08	03824-09	03824-12	03825-05	03825-09	03827-06	03827-10
Laboratory Report Number							17N238668	17N242036	17N238668	17N238668	17N238668	17N238668	17N238668	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971
Date Sampled							15-Jul-17	22-Jul-17	15-Jul-17	15-Jul-17	15-Jul-17	16-Jul-17	16-Jul-17	16-Jul-17	16-Jul-17	16-Jul-17	17-Jul-17	17-Jul-17	17-Jul-17	17-Jul-17	17-Jul-17	18-Jul-17	19-Jul-17	19-Jul-17
Depth of Sample (m bgs)							0.6	0.2	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.5	1.5	1.5	0.5	1.4	0.6	0.6	0.5
QA/QC										FDA				FDA	FD			FDA	FD					
APEC							4	4	13	13	13	13	13	1e	1e	23a	17	4	4	17	16	7b	27	27
Physical Tests																								
pH					6 to 8		6.04	-	5.19	4.82	-	4.83	5.06	-	-	4.88	5.16	5.54	5.63	5.48	5.32	5.28	5.72	6.38
pH (soluble)					6 to 8																			
Inorganic Compounds																								
Chloride (ion)	**100**	DW	100	DW			-	4	-	-	2	< 2	< 2	< 2	3	2	2	-	-	2	< 2	15	5	3
Sodium (ion)	**200**	T	1000	T			-	6	-	-	2	< 2	< 2	6	6	< 2	< 2	-	-	< 2	< 2	7	3	3
Metals																								
Aluminum	**40,000**	HH	250,000	HH			15100	-	16900	18000	-	16800	16700	-	-	12300	14000	10200	9980	12700	10500	12500	9930	12900
Antimony	**20**	EH	40	EH	20		0.4	-	0.5	0.4	-	0.3	0.5	-	-	0.4	0.4	0.3	0.2	0.3	0.4	0.5	0.5	0.6
Arsenic	**10**	P4	10	P4	12		9	-	**11.7**	9.4	-	9.5	**10.8**	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	9.4	7.1	7	7.9
Barium	**500**	P4	500	P4	500	RL/PL	267	-	393	360	-	395	367	-	-	189	193	304	205	323	**547**	388	252	463
Beryllium	**1-150**	AW/T	1-350	AW/T/PH	4		0.7	-	0.9	0.9	-	0.9	0.9	-	-	0.6	0.5	0.5	0.3	0.6	0.6	0.7	0.6	0.7
Bismuth							< 0.5	-	< 0.5	< 0.5	-	< 0.5	< 0.5	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Boron	**15,000**	HH	1,000,000	HH	2	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	**1 - 30**	AW/T	1 - 50	AW/PH	1.4	AL	0.12	-	0.18	0.13	-	0.13	0.17	-	-	0.11	0.1	0.18	0.11	0.11	0.14	0.12	0.19	0.28
Calcium							2760	-	2410	1340	-	1530	2210	-	-	684	1660	2030	2010	2110	2890	4000	2580	3930
Chromium (total)	**50**	P4	50	P4	64		22	-	25	25	-	24	26	-	-	< 1	< 1	< 1	< 1	< 1	17	18	16	19
Cobalt	**25**	P4	25	P4	40		9.4	-	9.9	9.5	-	9.1	11.9	-	-	< 0.1	< 0.1	0.1	< 0.1	< 0.1	7.6	7.7	10.2	9.5
Copper	**75 - 150**	AW/T	75 - 300	AW/T	63		22.1	-	30.4	26.6	-	28.6	29.4	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	23.2	19.6	18.6	24.6
Iron	**40,000**	P4	150,000	HH			25900	-	28800	26900	-	27900	29400	-	-	26500	25300	35700	39200	26000	26000	25900	18900	30800
Lead	**120**	I	120 - 1000	DW/T/PH	70	AL	13.3	-	15.4	13.6	-	15.2	15.8	-	-	11.2	8.2	8.3	5.1	10.6	13	10.8	9.6	12.2
Lithium	**65**	HH	450	HH			13.8	-	18.8	22.7	-	17.5	18.6	-	-	8.5	9.1	6.7	4.2	12.4	15.4	11.5	9.5	12.5
Magnesium							3090	-	3970	3570	-	3430	3830	-	-	2430	3330	2420	2370	3010	2520	2850	2420	3430
Manganese	**2000**	DW/T	2,000	DW/T			263	-	230	185	-	165	271	-	-	281	120	621	395	224	142	291	257	274
Mercury	**25**	I	75	T	6.6		0.05	-	0.06	0.04	-	0.06	0.06	-	-	0.03	0.03	0.02	0.02	0.05	0.04	0.04	0.04	0.05
Molybdenum	**15**	DW	15	DW	5	AL	1.6	-	2	1.4	-	1.4	1.8	-	-	1.2	0.9	0.6	0.4	1	1	1.3	1.2	1.5
Nickel	**70 - 150**	DW/T/PH	70 - 250	DW/T/PH	45		20.6	-	28.7	25.1	-	25.4	28	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	22.3	18.5	25.3	30.8
Phosphorous							498	-	559	423	-	449	619	-	-	506	430	629	657	460	936	1570	682	852
Potassium							2230	-	2580	2490	-	2110	2580	-	-	1650	1840	1890	1910	2040	1850	1820	1520	2080
Selenium	**4**	P4	4	P4	1		0.8	-	1	0.9	-	0.6	0.9	-	-	0.9	0.6	0.8	0.5	0.8	0.9	0.9	0.5	0.5
Silver	**20**	EH	40	EH	20		< 0.5	-	< 0.5	< 0.5	-	< 0.5	< 0.5	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Sodium (total)				T			92	-	118	138	-	183	99	-	-	89	84	61	62	101	126	182	77	161
Strontium	**20,000**	HH	150,000	HH			27	-	42	41	-	36	38	-	-	24	16	14	9	30	52	35	24	34
Thallium	**2**	DW/AW/I	2	DW/AW/I	1		0.2	-	0.2	0.2	-	0.2	0.3	-	-	0.1	0.1	< 0.1	< 0.1	0.1	0.1	0.2	0.2	0.2
Tin	**50**	EH	300	EH	5	AL	0.6	-	0.7	0.6	-	0.7	0.7	-	-	0.4	0.4	0.3	0.2	0.5	0.5	0.4	0.4	0.5
Titanium							147	-	127	146	-	125	144	-	-	92	114	59	57	70	80	115	96	86
Uranium	**30**	DW	30	DW	23		1.1	-	1.3	1.6	-	1.1	1.4	-	-	1.3	0.7	0.9	0.6	1.6	1.1	0.9	0.9	0.9
Vanadium	**100**	DW	100	DW	130		43	-	46	44	-	41	48	-	-	< 1	< 1	< 1	< 1	< 1	28	35	31	34
Zinc	**150 - 450**	AW/T/pH	150 - 450	AW/T/pH	200		79	-	115	98	-	101	114	-	-	< 1	< 1	< 1	< 1	< 1	88	76	78	98
Zirconium							2.3	-	3.6	2.6	-	2.3	2.8	-	-	1.8	1.7	1.4	0.9	1.8	2.1	2	2.9	2.8

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs= metres below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

pH = Standard is pH dependant

P4 = BC MoE Protocol 4 For Contaminated Sites

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

Table 12
Results of Soil Analyses - Metals and Inorganics
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_H (< 3m) $Stage10_3$	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-TP17-73	K19-TP17-74	K19-TP17-74	K19-TP17-75	K19-TP17-76	K19-TP17-77	K19-TP17-78	K19-TP17-80	K19-TP17-81	K19-TP17-82	K19-TP17-85	K19-TP17-85	K19-TP17-85	K19-TP17-86
Sample Control Number							03827-11	03828-01	03828-02	03828-06	03828-10	03829-03	03829-07	03840-04	03840-09	03841-01	03842-03	03842-05	03842-06	03842-08
Laboratory Report Number							17N240971	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036
Date Sampled							19-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	22-Jul-17	22-Jul-17	22-Jul-17	22-Jul-17
Depth of Sample (m bgs)							1.4	0.6	1.6	0.6	0.7	0.6	0.7	0.5	0.6	0.7	0.7	2.5	2.5	0.7
QA/QC																		FDA	FD	
APEC							27	12	12	12	12	11	11	13	13	13	13	13	13	15
Physical Tests																				
pH					6 to 8		6.84	5.6	6.7	5.53	5.67	6.76	6.99	5.48	5.61	6.14	5.41	6.48	6.53	5.65
pH (soluble)					6 to 8															
Inorganic Compounds																				
Chloride (ion)	**100**	DW	100	DW			-	-	-	-	-	-	-	< 2	-	-	3	-	-	3
Sodium (ion)	**200**	T	1000	T			-	-	-	-	-	-	-	< 2	-	-	2	-	-	2
Metals																				
Aluminum	**40,000**	HH	250,000	HH			11900	12000	12100	16100	13300	13000	12300	12600	15100	12600	13000	11300	12900	13900
Antimony	**20**	EH	40	EH	20		0.7	0.5	0.3	0.6	0.5	0.7	0.6	0.6	0.5	0.5	0.5	0.3	0.3	0.4
Arsenic	**10**	P4	10	P4	12		9.5	9.8	**10.2**	**12.3**	9	**13.3**	**10.6**	**12.7**	**10.4**	8.8	9.8	8.9	**10.4**	**10.2**
Barium	**500**	P4	500	P4	500	RL/PL	365	297	**648**	406	472	**1070**	304	458	**695**	**742**	**549**	**558**	**595**	**700**
Beryllium	**1-150**	AW/T	1-350	AW/T/PH	4		0.5	0.7	0.5	0.9	0.8	1.1	0.8	0.7	0.8	0.7	0.8	0.6	0.6	0.8
Bismuth							< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Boron	**15,000**	HH	1,000,000	HH	2	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	**1 - 30**	AW/T	1 - 50	AW/PH	1.4	AL	0.13	0.17	0.07	0.22	0.16	0.97	0.41	0.15	0.18	0.16	0.17	0.12	0.11	0.13
Calcium							3530	2190	3050	3180	2570	2980	3500	2290	2910	3030	2110	2460	2720	2530
Chromium (total)	**50**	P4	50	P4	64		14	20	19	23	20	25	22	22	19	19	21	19	23	20
Cobalt	**25**	P4	25	P4	40		4.3	8	3.1	12.8	6.4	20.3	10.9	10.3	23.4	8.5	11.9	6	5.2	9.8
Copper	**75 - 150**	AW/T	75 - 300	AW/T	63		24	24.6	27.1	28.7	25.6	38.6	27.4	26.5	24.8	27	25.2	20.1	20.2	25.3
Iron	**40,000**	P4	150,000	HH			14300	23000	30600	32300	27600	26000	24500	27800	32500	27000	26600	23100	27800	28300
Lead	**120**	I	120 - 1000	DW/T/PH	70	AL	12.4	11.7	13.4	13.7	11.3	18.6	13.2	13.3	14.5	14.9	14.7	19.1	19.6	14
Lithium	**65**	HH	450	HH			8.3	11.8	13.6	14.8	13.3	26.9	15.1	13.2	14.5	12.5	14.7	21.2	20.1	17
Magnesium							2700	2890	3150	4160	3270	2940	3360	3170	3750	2790	3030	2860	3210	3170
Manganese	**2000**	DW/T	2,000	DW/T			64	251	46	459	281	**2660**	391	252	761	193	400	114	103	275
Mercury	**25**	I	75	T	6.6		0.04	0.06	0.04	0.05	0.06	0.08	0.06	0.05	0.04	0.07	0.05	0.04	0.04	0.05
Molybdenum	**15**	DW	15	DW	5	AL	1.1	1.7	0.9	2.1	1.5	1.9	1.6	1.6	1.4	1.1	1.7	0.7	0.7	1.3
Nickel	**70 - 150**	DW/T/PH	70 - 250	DW/T/PH	45		11.8	24.8	14	33.2	29.2	**94.6**	35.6	27.4	38.2	25.1	29.7	19	18.7	27.6
Phosphorous							542	558	965	798	666	739	722	629	715	621	609	462	629	545
Potassium							1540	1590	2330	2140	1630	1690	1910	1710	1910	2070	1710	1960	2250	1780
Selenium	**4**	P4	4	P4	1		0.7	0.7	0.5	1.0	0.9	1.2	0.6	1.0	0.7	0.7	1.0	0.7	0.6	0.7
Silver	**20**	EH	40	EH	20		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Sodium (total)				T			63	74	399	111	99	95	97	85	161	435	114	144	159	166
Strontium	**20,000**	HH	150,000	HH			37	34	100	38	32	52	41	31	32	70	34	41	41	42
Thallium	**2**	DW/AW/I	2	DW/AW/I	1		0.2	0.2	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
Tin	**50**	EH	300	EH	5	AL	0.4	0.5	0.5	0.6	0.5	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6
Titanium							82	75	33	95	51	46	52	58	63	46	60	22	25	42
Uranium	**30**	DW	30	DW	23		1	1	1.3	1.2	1	1.5	1.2	1.1	1	0.9	1	1.6	1.8	0.9
Vanadium	**100**	DW	100	DW	130		27	37	26	41	37	44	39	39	33	30	36	24	24	31
Zinc	**150 - 450**	AW/T/pH	150 - 450	AW/T/pH	200		62	85	51	103	91	157	104	101	95	76	101	65	66	86
Zirconium							2.4	3.7	2.1	4.1	3.1	3	4	2.3	2.4	2	1.6	1.7	1.7	2

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs= metres below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

pH = Standard is pH dependant

P4 = BC MoE Protocol 4 For Contaminated Sites

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_R (< 3m) $Stage10_3$	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19A-09MW-01	K19A-09MW-01	K19A-09MW-01	K19A-09MW-02	K19A-09MW-02	K19A-09MW-02	K19A-09MW-03	K19A-09MW-03	K19A-09MW-03	K19A-09MW-04	K19A-09MW-04	K19A-09MW-04	K19A-09MW-05	K19A-09MW-05	K19A-09MW-05	K19A-09MW-05	K19A-09MW-06	K19A-09MW-06	K19A-09MW-06
Sample Control Number							K19A-09BH-01-4	K19A-09BH-01-8	09-DUP-03	K19A-09BH-02-2	K19A-09BH-02-8	K19A-09BH-02-9	K19A-09BH-03-1	K19A-09BH-03-4	K19A-09BH-03-6	K19A-09BH-04-3	09-DUP-01	K19A-09BH-04-7	09-DUP-02	K19A-09BH-05-1	K19A-09BH-05-4	K19A-09BH-05-8	K19A-09BH-06-2	K19A-09BH-06-4	K19A-09BH-06-6
Laboratory Report Number							101023050	101027170	101027170	101023050	101027170	101027170	101023050	101027170	101027170	101023050	101023050	101023050	101023050	101023050	101023050	101023050	101027170	101027170	101027170
Date Sampled							20-Oct-09	22-Oct-09	22-Oct-09	20-Oct-09	22-Oct-09	22-Oct-09	20-Oct-09	22-Oct-09	22-Oct-09	20-Oct-09	21-Oct-09	21-Oct-09	21-Oct-09	21-Oct-09	21-Oct-09	21-Oct-09	22-Oct-09	22-Oct-09	22-Oct-09
Depth of Sample (m bgs)							2.4-3	**9.1-9.8**	**9.1-9.8**	0.6-1.2	**7.6-8.2**	**8.2-9.1**	0-0.6	2.4-3	**4.3-4.9**	1.8-2.4	1.8-2.4	**6.7-7.9**	0-0.6	0-0.6	1.8-2.4	**6.4-7**	0.6-1.2	2.7-3.7	**5.8-6.4**
QA/QC								FD	FDA							FDA	FD		FDA	FD					
APEC																									
Field Parameters																									
Headspace by PID (ppm)																									
Physical Tests																									
% Moisture							6	7.4	6.8	9.2	3.8	4.8	11	4	12.7	8.8	8.8	9.4	12	12.8	14.3	13.9	10	6.3	3
Hydrocarbons																									
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			**1100**	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			390	< 250	< 250	320	< 250	< 250	< 250	< 250	< 250	< 250	< 250	320	710	930	510	370	310	390	< 250
LEPH	**1000***	HH/EH	2000	HH/EH			**1100**	-	-	< 250	-	-	< 250	-	-	< 250	< 250	< 250	< 250	< 250	< 250	< 250	-	-	-
HEPH	**1000***	HH/EH	5000	HH/EH			390	-	-	320	-	-	< 250	-	-	< 250	< 250	320	710	930	510	370	-	-	-
VPH	**200**	HH/EH	200	HH/EH			-	-	-	-	-	-	-	-	< 100	-	-	-	-	-	-	-	-	-	-
VH(C6-C10)	**200***	HH/EH	200	HH/EH			< 100	-	-	< 100	-	-	< 100	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	-	-	-
Polycyclic Aromatic Hydrocarbons (PAHs)																									
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	0.14	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.35	-	-	-
Acenaphthylene					320	AW	< 0.05	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.14	-	-	-
Anthracene	**2.5**	T	30	T	2.5	SC	0.29	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	0.13	-	-	0.06	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	< 0.05	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.1	-	-	-
Benzo(b)fluoranthene					0.1	AL	0.08	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-
Benzo(g,h,i)perylene							0.09	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	0.06	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-
Benzo[j]fluoranthene		EH					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**400**	HH	4500	HH	6.2	EI	0.18	-	-	0.08	-	-	< 0.05	-	-	0.09	< 0.05	0.06	< 0.05	< 0.05	< 0.05	0.08	-	-	-
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	< 0.05	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	0.09	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-
Fluoranthene	**50**	T	200	T	15.4	EI	< 0.05	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-
B[a]P TPE					5.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b+j)fluoranthene	**1**	EH	10	EH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	**1000**	HH	9500	HH	0.25	AW	0.28	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	0.1	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	< 0.05	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-
IACR					1.0		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**0.6**	T	20	T	0.013	AW	< 0.05	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	0.17	< 0.05	< 0.05	< 0.05	0.16	-	-	-
Phenanthrene	**5**	EH	50	EH	0.046	AW	0.41	-	-	0.1	-	-	< 0.05	-	-	0.09	0.08	0.27	< 0.05	< 0.05	0.07	< 0.05	-	-	-
Pyrene	**10**	EH	100	HH	0.1	EI	< 0.05	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.06	-	-	-
Quinoline	**4.5**	HH	10	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	**100**	HH	950	HH			< 0.05	-	-	< 0.05	-	-	< 0.05	-	-	0.09	< 0.05	0.57	< 0.05	< 0.05	< 0.05	0.62	-	-	-
1-Methylnaphthalene	**500**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Molecular Weight PAHs							1.12	-	-	0.1	-	-	-	-	-	0.18	0.08	1.11	-	-	0.07	1.28	-	-	-
High Molecular Weight PAHs							0.54	-	-	0.14	-	-	-	-	-	0.09	-	0.2	-	-	-	0.24	-	-	-
Total PAHs							1.66	-	-	0.24	-	-	-	-	-	0.27	0.08	1.3	-	-	0.07	1.52	-	-	-

Notes:
All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

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Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_n(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30 Exceeds CSR WLR (<3m) standard
30 Exceeds CSR IL (>3m) standard
23 Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.
Italics = indicates that the detection limit exceeds one or more criteria.
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19A-09MW-06	K19A-09MW-07	K19A-09MW-07	K19A-09MW-08	K19A-09MW-08	K19A-09MW-08	K19A-09MW-09	K19A-09MW-09	K19A-09MW-09	K19A-09MW-10	K19A-09MW-10	K19A-09MW-10	K19A-09MW-11	K19A-09MW-11	K19A-09MW-11	K19B-09BH-01	K19B-09BH-01	K19B-09BH-02	K19B-09BH-02	K19B-09BH-03
Sample Control Number							K19A-09BH-06-8	K19A-09BH-07-1	K19A-09BH-07-3	K19A-09BH-08-2	K19A-09BH-08-7	K19A-09BH-08-8	K19A-09BH-09-2	K19A-09BH-09-8	K19A-09BH-09-9	K19A-09BH-10-1	K19A-09BH-10-5	K19A-09BH-10-6	K19A-09BH-11-3	K19A-09BH-11-4	09-DUP-04	K19B-09BH-01-1	K19B-09BH-01-4	K19B-09BH-02-2	K19B-09BH-02-6	K19B-09BH-03-2
Laboratory Report Number							101027170	101027170	101027170	101027170	101027170	101027170	101027170	101027170	101027170	101027170	101027170	101027170	101029036	101029036	101029036	101029036	101029036	101029036	101029036	101029019
Date Sampled							22-Oct-09	22-Oct-09	22-Oct-09	22-Oct-09	22-Oct-09	22-Oct-09	22-Oct-09	22-Oct-09	22-Oct-09	22-Oct-09	22-Oct-09	22-Oct-09	24-Oct-09	24-Oct-09	24-Oct-09	24-Oct-09	24-Oct-09	24-Oct-09	24-Oct-09	26-Oct-09
Depth of Sample (m bgs)							**6.7-7.3**	0-0.6	1.2-2.4	0.6-1.2	**5.5-6.1**	**6.7-7.3**	0.6-1.2	**6.7-7.3**	**7.3-8.2**	0-0.6	**3.7-4.3**	**4.9-5.5**	1.8-2.4	**3-3.7** FD	**3-3.7** FDA	0-0.6	**3-3.7**	0.6-1.2	4.9-5.5	0.6-1.2
QA/QC																										
APEC																										
Field Parameters																										
Headspace by PID (ppm)																										
Physical Tests																										
% Moisture							16	17.4	13.5	13.5	5.3	6.9	10.6	5.4	8.6	14.7	7.4	4.1	14.5	10.4	10	16.1	5.2	10.7	5.1	16.1
Hydrocarbons																										
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	730	350	< 250	< 250	< 250	< 250	< 250
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			390	< 250	< 250	< 250	< 250	< 250	< 250	< 250	350	360	< 250	< 250	< 250	< 250	< 250	580	< 250	430	< 250	< 250
LEPH	**1000***	HH/EH	2000	HH/EH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HEPH	**1000***	HH/EH	5000	HH/EH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH	**200**	HH/EH	200	HH/EH			< 100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VH(C6-C10)	**200***	HH/EH	200	HH/EH			< 100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 100	-	-	-
Polycyclic Aromatic Hydrocarbons (PAHs)																										
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene					320	AW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	**2.5**	T	30	T	2.5	SC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene					0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo[j]fluoranthene		EH					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**400**	HH	4500	HH	6.2	EI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	**50**	T	200	T	15.4	EI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B[a]P TPE					5.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b+j)fluoranthene	**1**	EH	10	EH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	**1000**	HH	9500	HH	0.25	AW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IACR					1.0		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**0.6**	T	20	T	0.013	AW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	**5**	EH	50	EH	0.046	AW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	**10**	EH	100	HH	0.1	EI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Quinoline	**4.5**	HH	10	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	**100**	HH	950	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	**500**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Molecular Weight PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
High Molecular Weight PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19B-09BH-03	K19B-09MW-03	K19B-09BH-04	K19B-09BH-04	K19B-09BH-04	K19B-09BH-04	K19B-09BH-05	K19B-09BH-05	K19B-09BH-05	K19B-09BH-06	K19B-09BH-06	K19B-09BH-06	K19B-09BH-07	K19B-09BH-07	K19B-09BH-07	K19-10TP-03	K19-10TP-05	K19-10TP-09	K19-10TP-11	K19-10TP-12	K19-10TP-13
Sample Control Number							K19B-09BH-03-8	09-DUP-05	K19B-09BH-04-1	K19B-09BH-04-6	K19B-09BH-04-7	K19B-09BH-05-2	K19B-09BH-05-3	K19B-09BH-05-4	K19B-09BH-06-2	K19B-09BH-06-3	K19B-09BH-06-7	K19B-09BH-07-3	K19B-09BH-07-4	K19B-09BH-07-8	K19-10TP-03-3	K19-10TP-05-2	K19-10TP-09-5	K19-10TP-11-2	K19-10TP-12-4	K19-10TP-13-3
Laboratory Report Number							1010290 19	1010290 19	1010290 19	1010290 19	1010290 19	1010290 19	1010290 19	1010290 19	1010290 19	1010290 19	1010290 19	1010290 19	1010290 19	1010290 19	B068158	B068158	B068158	B068158	B068605	B068605
Date Sampled							26-Oct-09	26-Oct-09	26-Oct-09	26-Oct-09	26-Oct-09	26-Oct-09	26-Oct-09	26-Oct-09	26-Oct-09	26-Oct-09	26-Oct-09	26-Oct-09	26-Oct-09	26-Oct-09	5-Aug-10	5-Aug-10	5-Aug-10	5-Aug-10	6-Aug-10	6-Aug-10
Depth of Sample (m bgs)							**7.3-7.6**	**7.3-7.6**	0-0.6	**5.5-6.1**	**6.1-7**	0.6-1.2	1.8-2.4	**3-3.7**	0.6-1.2	1.8-2.4	**6.1-6.7**	1.2-2.4	**3-3.7**	**7.9-8.8**	0.3-0.91	0.3-0.91	1.83-2.13	0.3-0.6	2.15-2.45	1.2-1.5
QA/QC							FDA	FD																		
APEC																										
Field Parameters																										
Headspace by PID (ppm)																										
Physical Tests																										
% Moisture							18.6	18.7	18.8	5.3	20.4	16.8	15	11	14.9	12.5	10.4	13.7	8.7	15.5	9.7	25	14	10	13	8.2
Hydrocarbons																										
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	-	**10900**	892	< 100	**14200**	277
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			< 250	< 250	< 250	360	320	< 250	360	320	< 250	< 250	< 250	< 250	590	330	-	**1090**	< 100	< 100	310	< 100
LEPH	**1000***	HH/EH	2000	HH/EH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**10900**	891	< 100	-	-
HEPH	**1000***	HH/EH	5000	HH/EH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1090**	< 100	< 100	-	-
VPH	**200**	HH/EH	200	HH/EH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	35	-	-	-	-	-
VH(C6-C10)	**200***	HH/EH	200	HH/EH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	34	-	-	-	-	-
Polycyclic Aromatic Hydrocarbons (PAHs)																										
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.28	< 0.020	< 0.010	3.1	< 0.0010
Acenaphthylene					320	AW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.10	< 0.030	< 0.010	< 1.3	< 0.0030
Anthracene	**2.5**	T	30	T	2.5	SC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.14	< 0.020	< 0.010	< 0.12	< 0.0010
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0020
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.010	< 0.010	< 0.010	< 0.010	0.0022
Benzo(b)fluoranthene					0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.020	0.047	0.056	0.035	0.023
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.010	< 0.010	< 0.010	< 0.010	0.0015
Benzo[j]fluoranthene		EH					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**400**	HH	4500	HH	6.2	EI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.010	0.012	0.013	0.042	0.026
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.020	< 0.020	< 0.020	< 0.020	0.0034
Fluoranthene	**50**	T	200	T	15.4	EI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.020	< 0.010	< 0.010	0.02	0.0035
B[a]P TPE					5.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b+j)fluoranthene	**1**	EH	10	EH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.010	0.038	0.045	0.024	0.017
Fluorene	**1000**	HH	9500	HH	0.25	AW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.14	0.21	< 0.010	5.9	0.0054
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.020	< 0.020	< 0.020	< 0.020	< 0.0020
IACR					1.0		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**0.6**	T	20	T	0.013	AW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.14	**1**	0.27	**29**	< 0.30
Phenanthrene	**5**	EH	50	EH	0.046	AW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.34	0.28	0.084	2	0.049
Pyrene	**10**	EH	100	HH	0.1	EI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.09	0.027	0.015	0.047	0.0076
Quinoline	**4.5**	HH	10	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	**100**	HH	950	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.21	0.7	0.29	**120**	0.16
1-Methylnaphthalene	**500**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	-
Low Molecular Weight PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.34	2.2	0.64	160	< 0.30
High Molecular Weight PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.09	0.12	0.13	0.17	0.083
Total PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.34	2.3	0.77	160	< 0.30

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_{aliph}(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location								K19-10TP-17	K19-10TP-17	K19-10TP-18	K19-10TP-22	K19-10TP-23	K19-10TP-24	K19-10TP-30	K19-10TP-31	K19-10TP-35	K19-10TP-35	K19-10TP-36	K19-10TP-38	K19-10TP-39	K19-10TP-41	K19-10TP-42	K19-10TP-43	K19A-10BH-01	K19A-10BH-01	K19A-10BH-08	K19A-10BH-11
Sample Control Number	BC CSR Standards for WL_R (< 3m) Stage 10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes		K19-10TP-17-5	K19-10TP-DUP-2	K19-10TP-18-2	K19-10TP-22-6	K19-10TP-23-5	K19-10TP-24-6	K19-10TP-30-5	K19-10TP-31-6	K19-10TP-35-1	K19-10TP-DUP-3	K19-10TP-36-1	K19-10TP-38-1	K19-10TP39-4	K19-10TP-41-4	K19-10TP-42-6	K19-10TP-43-2	K19A-10BH-01-7	K19A-10BH-01-8	K19A-10BH-08-3	K19A-10BH-11-4
Laboratory Report Number								B068605	B068605	B068605	B068605	B068605	B068605	B068605	B068605	B068605	B068605	B068605	B068605	B069119	B069119	B069119	B069119	B071276	B071276	B073313	B073093
Date Sampled								6-Aug-10	6-Aug-10	6-Aug-10	7-Aug-10	7-Aug-10	7-Aug-10	8-Aug-10	8-Aug-10	8-Aug-10	8-Aug-10	8-Aug-10	8-Aug-10	9-Aug-10	9-Aug-10	9-Aug-10	9-Aug-10	12-Aug-10	12-Aug-10	15-Aug-10	17-Aug-10
Depth of Sample (m bgs)								2.75-3.05	2.75-3.05	0.9-1.2	2.75-3.05	2.15-2.45	**3.35-3.65**	2.75-3	**3.65-3.95**	0-0.3	0-0.3	0-0.3	0.3-0.6	2.15-2.45	2.15-2.45	2.75-3.05	0.6-0.9	**3.88-3.96**	2.9-3.05	2.1-2.4	2.4-2.7
QA/QC								FDA	FD							FDA	FD										
APEC																											
Field Parameters																											
Headspace by PID (ppm)																											
Physical Tests																											
% Moisture								11	11	7.9	9.3	17	14	17	10	15	14	18	13	14	16	9.1	8.7	4.3	5.6	13	10
Hydrocarbons																											
F1 - BTEX	**200***	HH/EH	200	HH/EH	30			**730**	**820**	-	-	-	-	< 10	-	-	-	-	-	-	-	**570**	-	-	-	-	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30			**700**	**790**	-	-	-	-	< 10	-	-	-	-	-	-	-	**550**	-	-	-	-	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH				-	-	184	**1190**	**7570**	3020	-	497	< 100	< 100	< 100	< 100	< 100	< 100	-	< 100	-	**1490**	< 100	< 100
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH				-	-	< 100	< 100	< 100	< 100	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	-	< 100	-	113	< 100	< 100
LEPH	**1000***	HH/EH	2000	HH/EH				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1490**	-	< 100
HEPH	**1000***	HH/EH	5000	HH/EH				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	113	-	< 100
VPH	**200**	HH/EH	200	HH/EH				**620**	**690**	-	-	-	-	< 10	-	-	-	-	-	-	-	**520**	-	49	53	< 10	-
VH(C6-C10)	**200***	HH/EH	200	HH/EH				**650**	**730**	-	-	-	-	< 10	-	-	-	-	-	-	-	**530**	-	49	53	< 10	-
Polycyclic Aromatic Hydrocarbons (PAHs)																											
Acenaphthene	**2000**	HH	15000	HH	0.28	AW		-	-	< 0.0030	< 0.050	0.41	0.2	-	< 0.025	< 0.0010	< 0.0010	< 0.0010	< 0.0020	< 0.0010	< 0.0010		< 0.0010	-	< 0.067	-	< 0.010
Acenaphthylene					320	AW		-	-	< 0.0020	< 0.030	< 0.17	< 0.11	-	< 0.015	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	-	< 0.0020	-	< 0.095	-	< 0.010
Anthracene	**2.5**	T	30	T	2.5	SC		-	-	< 0.0010	< 0.020	< 0.050	< 0.030	-	< 0.0040	< 0.0010	< 0.0010	< 0.0010	0.014	< 0.0010	< 0.0010	-	< 0.0010	-	< 0.010	-	< 0.010
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL		-	-	< 0.0030	0.019	< 0.010	< 0.010	-	0.011	< 0.0010	< 0.0010	< 0.0010	0.001	0.0024	0.0012	-	0.0034	-	< 0.010	-	< 0.010
Benzo(a)pyrene	**10**	I	50	I	0.6	EI		-	-	0.0017	0.024	< 0.010	0.011	-	0.012	< 0.0010	< 0.0010	< 0.0010	< 0.0010	0.0025	< 0.0010	-	0.0048	-	< 0.010	-	< 0.010
Benzo(b)fluoranthene					0.1	AL		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene								-	-	0.026	0.17	0.057	0.11	-	0.13	0.0064	0.0044	0.01	0.0086	0.031	0.013	-	0.069	-	0.053	-	0.059
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL		-	-	0.0032	0.016	0.044	0.012	-	0.011	0.0012	0.0012	0.0017	< 0.0010	0.002	0.0019	-	0.0023	-	< 0.010	-	< 0.010
Benzo[j]fluoranthene		EH						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**400**	HH	4500	HH	6.2	EI		-	-	0.025	0.14	0.047	0.077	-	0.11	0.0066	0.0054	0.014	0.015	0.0063	0.02	-	0.018	-	0.072	-	0.017
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL		-	-	0.0047	0.02	< 0.020	< 0.020	-	0.014	< 0.0020	< 0.0020	< 0.0020	< 0.0020	0.0063	0.0023	-	0.011	-	< 0.020	-	< 0.020
Fluoranthene	**50**	T	200	T	15.4	EI		-	-	0.0041	0.045	0.01	0.015	-	0.03	0.0013	0.0013	0.0024	0.0026	0.0056	0.0036	-	0.009	-	0.015	-	0.015
B[a]P TPE					5.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b+j)fluoranthene	**1**	EH	10	EH				-	-	0.024	0.068	0.042	0.058	-	0.062	0.0068	0.0058	0.017	0.016	0.028	0.017	-	0.042	-	0.035	-	0.042
Fluorene	**1000**	HH	9500	HH	0.25	AW		-	-	< 0.0010	0.22	1.1	0.6	-	0.093	< 0.0010	< 0.0010	< 0.0010	< 0.0010	0.0013	< 0.0010	-	< 0.0030	-	0.25	-	< 0.010
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL		-	-	0.0037	0.022	< 0.020	< 0.020	-	0.014	< 0.0020	< 0.0020	< 0.0020	< 0.0020	0.0061	0.0024	-	0.0099	-	< 0.020	-	< 0.020
IACR					1.0			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**0.6**	T	20	T	0.013	AW		-	-	0.48	**1.2**	**16**	5.3	-	0.17	0.0048	0.0021	0.0056	0.0056	0.01	0.006	-	0.026	-	< 0.33	-	0.015
Phenanthrene	**5**	EH	50	EH	0.046	AW		-	-	0.027	0.61	0.83	0.48	-	0.22	0.008	0.0065	0.0097	0.013	0.022	0.014	-	0.093	-	0.41	-	0.066
Pyrene	**10**	EH	100	HH	0.1	EI		-	-	0.006	0.072	0.02	0.032	-	0.039	0.0024	0.0021	0.0031	0.0032	0.0059	0.0044	-	0.011	-	0.028	-	0.018
Quinoline	**4.5**	HH	10	HH				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	**100**	HH	950	HH				-	-	0.18	3.5	15	11	-	0.31	0.006	0.0039	0.0075	0.0075	0.01	0.0075	-	0.052	-	0.33	-	0.017
1-Methylnaphthalene	**500**	HH	1000	HH				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Molecular Weight PAHs								-	-	0.69	5.5	33	17	-	0.79	0.019	0.013	0.023	0.04	0.044	0.028	-	0.17	-	0.99	-	0.098
High Molecular Weight PAHs								-	-	0.099	0.6	0.22	0.32	-	0.44	0.025	0.02	0.048	0.047	0.097	0.066	-	0.18	-	0.2	-	0.15
Total PAHs								-	-	0.78	6.1	33	18	-	1.2	0.044	0.033	0.071	0.087	0.14	0.094	-	0.35	-	1.2	-	0.25

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_n(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19A-10BH-11	K19A-10BH-11	K19A-10BH-11	K19A-10BH-11	K19A-10BH-23	K19A-10MW-02	K19A-10MW-02	K19A-10MW-03	K19A-10MW-03	K19A-10MW-04	K19A-10MW-04	K19A-10MW-04	K19A-10MW-05	K19A-10MW-05	K19A-10MW-06	K19A-10MW-07	K19A-10MW-07	K19A-10MW-09	K19A-10MW-09	K19A-10MW-10
Sample Control Number	BC CSR Standards for WL_R (< 3m) Stage10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19A-10BH-11-5	K19A-10BH-11-7	K19A-10BH-11-8	K19-DUP-6	K19A-10BH-23-6	K19A-10MW-02-2	K19A-10MW-02-5	K19A-10MW-03-2	K19A-10MW-DUP-1	K19A-10MW-04-4	K19A-10MW-04-6	K19A-10MW-04-7	K19A-10MW-05-3	K19-DUP-2	K19A-10MW-06-4	K19A-10MW-07-3	K19A-10MW-DUP-3	K19A-10MW-09-4	K19A-DUP-4	K19A-10MW-10-2
Laboratory Report Number							B073093	B073093	B073093	B073093	B076441	B073372	B073372	B073372	B073372	B073302	B073302	B073302	B073302	B073302	B073313	B073313	B073313	B073270	B073270	B073270
Date Sampled							17-Aug-10	17-Aug-10	17-Aug-10	17-Aug-10	23-Aug-10	13-Aug-10	13-Aug-10	13-Aug-10	13-Aug-10	14-Aug-10	14-Aug-10	14-Aug-10	14-Aug-10	14-Aug-10	15-Aug-10	15-Aug-10	15-Aug-10	16-Aug-10	16-Aug-10	16-Aug-10
Depth of Sample (m bgs)							**3.05-3.35**	**3.8-3.95**	**3.95-4.1**	2.4-2.7	2.6-2.74	1.52-2.13	**3.84-3.99**	1.22-1.52	1.22-1.52	2.6-2.75	**3.8-4**	**4.6-4.8**	2.4-2.7	2.4-2.7	**3.05-3.35**	2.6-2.9	2.6-2.9	2.3-2.6	2.3-2.6	0.9-1.4
QA/QC										FD	FDA			FDA	FD				FDA	FD		FDA	FD	FDA	FD	
APEC																										
Field Parameters																										
Headspace by PID (ppm)																										
Physical Tests																										
% Moisture							8.8	8.7	7	12	12	8	5.3	9.7	9	6.6	11	8.8	13	12	13	7.1	7.7	7.9	7.9	17
Hydrocarbons																										
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			397	281	< 100	< 100	< 100	**8320**	1370	< 100	< 100	< 100	314	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	-
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			< 100	< 100	< 100	< 100	< 100	397	471	< 100	< 100	< 100	153	< 100	< 100	< 100	< 100	111	116	< 100	< 100	-
LEPH	**1000***	HH/EH	2000	HH/EH			-	280	-	-	< 100	**8300**	-	-	-	-	314	-	-	-	-	-	-	-	-	-
HEPH	**1000***	HH/EH	5000	HH/EH			-	< 100	-	-	< 100	397	-	-	-	-	152	-	-	-	-	-	-	-	-	-
VPH	**200**	HH/EH	200	HH/EH			24	32	19	-	-	-	28	< 10	< 10	< 10	20	29	< 10	< 10	< 10	< 10	< 10	< 10	< 10	**470**
VH(C6-C10)	**200***	HH/EH	200	HH/EH			24	33	19	-	-	-	28	< 10	< 10	< 10	20	29	< 10	< 10	< 10	< 10	< 10	< 10	< 10	**480**
Polycyclic Aromatic Hydrocarbons (PAHs)																										
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	-	< 0.030	-	-	< 0.010	0.7	-	-	-	-	< 0.030	-	-	-	-	-	-	-	-	-
Acenaphthylene					320	AW	-	< 0.020	-	-	< 0.010	< 0.28	-	-	-	-	< 0.020	-	-	-	-	-	-	-	-	-
Anthracene	**2.5**	T	30	T	2.5	SC	-	< 0.010	-	-	< 0.010	< 0.080	-	-	-	-	< 0.010	-	-	-	-	-	-	-	-	-
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	-	0.026	-	-	< 0.010	< 0.020	-	-	-	-	< 0.010	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	-	0.031	-	-	< 0.010	< 0.010	-	-	-	-	0.013	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene					0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene							-	0.19	-	-	0.058	0.044	-	-	-	-	0.13	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	-	< 0.010	-	-	< 0.010	< 0.010	-	-	-	-	< 0.010	-	-	-	-	-	-	-	-	-
Benzo[j]fluoranthene		EH					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**400**	HH	4500	HH	6.2	EI	-	0.041	-	-	0.079	0.055	-	-	-	-	0.15	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	-	< 0.020	-	-	< 0.020	< 0.020	-	-	-	-	< 0.020	-	-	-	-	-	-	-	-	-
Fluoranthene	**50**	T	200	T	15.4	EI	-	0.055	-	-	0.017	0.033	-	-	-	-	0.027	-	-	-	-	-	-	-	-	-
B[a]P TPE					5.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b+j)fluoranthene	**1**	EH	10	EH			-	0.075	-	-	0.055	0.03	-	-	-	-	0.069	-	-	-	-	-	-	-	-	-
Fluorene	**1000**	HH	9500	HH	0.25	AW	-	< 0.070	-	-	< 0.010	2.2	-	-	-	-	0.075	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	-	0.022	-	-	< 0.020	< 0.020	-	-	-	-	< 0.020	-	-	-	-	-	-	-	-	-
IACR					1.0		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**0.6**	T	20	T	0.013	AW	-	0.55	-	-	0.031	**18**	-	-	-	-	< 0.12	-	-	-	-	-	-	-	-	-
Phenanthrene	**5**	EH	50	EH	0.046	AW	-	0.51	-	-	0.071	2	-	-	-	-	0.29	-	-	-	-	-	-	-	-	-
Pyrene	**10**	EH	100	HH	0.1	EI	-	0.084	-	-	0.028	0.062	-	-	-	-	0.069	-	-	-	-	-	-	-	-	-
Quinoline	**4.5**	HH	10	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	**100**	HH	950	HH			-	0.64	-	-	0.028	62	-	-	-	-	0.17	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	**500**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Molecular Weight PAHs							-	1.7	-	-	0.13	85	-	-	-	-	0.54	-	-	-	-	-	-	-	-	-
High Molecular Weight PAHs							-	0.53	-	-	0.24	0.22	-	-	-	-	0.46	-	-	-	-	-	-	-	-	-
Total PAHs							-	2.2	-	-	0.37	86	-	-	-	-	0.99	-	-	-	-	-	-	-	-	-

Notes:

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K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19A-10MW-10	K19A-10MW-19	K19A-10MW-19	K19A-10MW-19	K19A-10MW-20	K19A-10MW-20	K19A-10MW-20	K19A-10MW-20	K19A-10MW-21	K19A-10MW-21	K19A-10MW-21	K19A-10MW-21	K19A-10MW-22	K19A-10MW-22	K19A-10MW-22	K19A-10MW-22	K19A-10MW-24	K19A-10MW-24	K19A-10MW-24	K19A-10MW-25
Sample Control Number	BC CSR Standards for WL_R (< 3m) Stage10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19A-10MW-10-5	K19A-10MW-19-3	K19A-10MW-19-5	K19A-10MW-19-7	K19A-10MW-20-3	K19A-10MW-20-5	K19A-10MW-20-6	K19-DUP-11	K19A-10MW-21-4	K19-DUP-12	K19A-10MW-21-6	K19A-10MW-21-7	K19A-10MW-22-1	K19A-10MW-22-3	K19-DUP-13	K19A-10MW-22-6	K19A-10MW-24-5	K19A-10MW-24-6	K19A-DUP-14	K19A-10MW-25-4
Laboratory Report Number							B073270	B076365	B076365	B076365	B076365	B076365	B076365	B076365	B076365	B076365	B076365	B076365	B076365	B076365	B076365	B076365	B076441	B076441	B076441	B076441
Date Sampled							16-Aug-10	20-Aug-10	21-Aug-10	21-Aug-10	21-Aug-10	21-Aug-10	21-Aug-10	21-Aug-10	22-Aug-10	22-Aug-10	22-Aug-10	22-Aug-10	22-Aug-10	22-Aug-10	22-Aug-10	22-Aug-10	24-Aug-10	24-Aug-10	24-Aug-10	24-Aug-10
Depth of Sample (m bgs)							2.6-2.9	1.5-2.15	2.6-2.9	**3.95-4.25**	1.65-1.8	**3.05-3.2**	**4.1-4.4**	**4.1-4.4**	2.45-2.75	2.45-2.75	**3.5-3.65**	**3.8-3.95**	0.1-0.45	1.2-1.5	1.2-1.5	**3.95-4.25**	2.44-2.74	**3.05-3.35**	**3.05-3.35**	2.44-2.92
QA/QC													FDA	FD	FDA	FD				FDA	FD			FDA	FD	
APEC																										
Field Parameters																										
Headspace by PID (ppm)																										
Physical Tests																										
% Moisture							7.4	15	9.6	7.7	16	12	8.6	8.9	13	18	11	9.2	17	18	18	7.8	11	10	7.2	6.8
Hydrocarbons																										
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			**1130**	< 100	257	< 100	**1290**	1320	< 100	< 100	< 100	< 100	497	< 100	-	659	-	< 100	< 100	1190	432	< 100
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	-	< 100	-	< 100	< 100	111	100	< 100
LEPH	**1000***	HH/EH	2000	HH/EH			**1130**	< 100	256	< 100	**1290**	1310	< 100	< 100	< 100	-	-	< 100	-	659	-	< 100	< 100	1190	431	< 100
HEPH	**1000***	HH/EH	5000	HH/EH			< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	-	-	< 100	-	< 100	-	< 100	< 100	111	100	< 100
VPH	**200**	HH/EH	200	HH/EH			**390**	-	-	-	-	-	-	-	-	-	-	-	< 10	-	47	-	-	-	-	-
VH(C6-C10)	**200***	HH/EH	200	HH/EH			**400**	-	-	-	-	-	-	-	-	-	-	-	< 10	-	47	-	-	-	-	-
Polycyclic Aromatic Hydrocarbons (PAHs)																										
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	< 0.15	< 0.010	< 0.010	< 0.010	0.13	0.22	< 0.010	< 0.010	< 0.010	-	-	< 0.010	-	0.027	-	0.014	< 0.010	< 0.030	0.038	< 0.010
Acenaphthylene					320	AW	< 0.050	< 0.010	< 0.010	< 0.018	< 0.17	< 0.11	< 0.010	< 0.010	< 0.010	-	-	< 0.010	-	< 0.020	-	< 0.010	< 0.010	< 0.020	< 0.010	< 0.010
Anthracene	**2.5**	T	30	T	2.5	SC	< 0.020	< 0.010	< 0.010	< 0.010	< 0.020	< 0.010	< 0.010	< 0.010	< 0.010	-	-	< 0.010	-	< 0.010	-	< 0.010	< 0.010	< 0.020	< 0.010	< 0.010
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	0.028	< 0.010	0.012	0.034	< 0.010	0.022	0.034	0.039	< 0.010	-	-	0.042	-	< 0.010	-	0.027	0.018	0.027	0.033	0.016
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	0.048	< 0.010	0.012	0.054	< 0.010	0.027	0.051	0.063	< 0.010	-	-	0.066	-	< 0.010	-	0.05	0.017	0.037	0.048	0.025
Benzo(b)fluoranthene					0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene							0.33	0.053	0.16	0.37	0.031	0.24	0.35	0.42	0.1	-	-	0.42	-	0.023	-	0.3	0.19	0.26	0.27	0.18
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	0.017	< 0.010	0.012	0.015	< 0.010	0.012	0.026	0.026	0.011	-	-	0.027	-	< 0.010	-	0.021	0.016	0.02	< 0.017	< 0.010
Benzo[j]fluoranthene		EH					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**400**	HH	4500	HH	6.2	EI	0.21	0.026	0.18	0.18	0.03	0.16	0.2	0.22	0.11	-	-	0.2	-	0.016	-	0.12	0.15	0.17	0.13	0.14
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	0.025	< 0.020	0.02	0.032	< 0.020	0.026	0.031	0.037	< 0.020	-	-	0.044	-	< 0.020	-	0.021	< 0.020	0.026	0.032	< 0.020
Fluoranthene	**50**	T	200	T	15.4	EI	0.059	< 0.010	0.062	0.079	< 0.010	0.056	0.074	0.08	0.021	-	-	0.069	-	< 0.010	-	0.044	0.034	0.056	0.05	0.029
B[a]P TPE					5.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b+j)fluoranthene	**1**	EH	10	EH			0.097	0.031	0.088	0.098	0.027	0.095	0.1	0.12	0.065	-	-	0.12	-	0.017	-	0.079	0.088	0.1	0.08	0.059
Fluorene	**1000**	HH	9500	HH	0.25	AW	0.39	< 0.010	0.15	0.017	0.28	0.63	< 0.010	< 0.010	< 0.010	-	-	0.021	-	0.11	-	0.16	< 0.010	0.16	0.29	0.036
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	0.036	< 0.020	0.021	0.036	< 0.020	0.03	0.035	0.043	< 0.020	-	-	0.051	-	< 0.020	-	0.033	0.021	0.033	0.038	< 0.020
IACR					1.0		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	**0.6**	T	20	T	0.013	AW	**1.9**	0.025	0.31	0.28	**3.5**	7.9	0.17	0.27	0.022	-	-	0.25	-	< 0.19	-	0.23	0.053	0.19	0.37	0.016
Phenanthrene	**5**	EH	50	EH	0.046	AW	0.78	0.033	0.55	0.65	0.21	0.66	0.66	0.77	0.082	-	-	0.66	-	0.15	-	0.43	0.18	0.5	0.52	0.18
Pyrene	**10**	EH	100	HH	0.1	EI	0.14	< 0.010	0.047	0.12	0.012	0.07	0.12	0.14	0.022	-	-	0.13	-	< 0.010	-	0.092	0.049	0.098	0.099	0.086
Quinoline	**4.5**	HH	10	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	**100**	HH	950	HH			6	0.051	0.87	1	0.99	4	0.39	0.63	0.023	-	-	0.67	-	0.08	-	0.76	0.069	0.62	1.3	0.061
1-Methylnaphthalene	**500**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Molecular Weight PAHs							9	0.11	1.9	2	5.1	13	1.2	1.7	0.13	-	-	1.6	-	0.36	-	1.6	0.3	1.5	2.5	0.29
High Molecular Weight PAHs							0.98	0.11	0.62	1	0.1	0.74	1	1.2	0.33	-	-	1.2	-	0.056	-	0.78	0.58	0.82	0.79	0.54
Total PAHs							10	0.22	2.5	3	5.2	14	2.2	2.9	0.45	-	-	2.8	-	0.42	-	2.4	0.88	2.3	3.3	0.83

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_n(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30 Exceeds CSR WLR (<3m) standard
30 Exceeds CSR IL (>3m) standard
23 Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.
Italics = indicates that the detection limit exceeds one or more criteria.
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_{HI} (< 3m) $Stage10_3$	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19A-10MW-26	K19A-10MW-26	K19A-10MW-26	K19A-10MW-27	K19A-10MW-28	K19A-10MW-28	K19A-10MW-28	K19A-10MW-28	K19A-10MW-28	K19B-10BH-17	K19B-10BH-17	K19B-10MW-12	K19B-10MW-12	K19B-10MW-12	K19-DUP-7	K19B-10MW-15	K19B-10MW-15	K19B-10MW-15	K19-DUP-9	K19B-10MW-16	K19B-10MW-18	K19B-10MW-18	K19-DUP-10	K19-MW16-01S
Sample Control Number							K19A-10MW-26-4	K19A-10MW-26-6	K19A-10MW-26-7	K19A-10MW-27-3	K19A-10MW-28-1	K19-DUP-16	K19A-10MW-28-3	K19A-10MW-28-6	K19B-10BH-17-2	K19B-10BH-17-5	K19B-10MW-12-1	K19B-10MW-12-5	K19-DUP-7	K19B-10MW-15-1	K19B-10MW-15-6	K19-DUP-9	K19B-10MW-16-5	K19B-10MW-18-5	K19-DUP-10	K19-MW16-01S/SA1
Laboratory Report Number							B077440	B077440	B077440	B077440	B077440	B077440	B077440	B077440	B076365	B076365	B073095	B073095	B073095	B074322	B074322	B074322	B074322	B076365	B076365	B619198
Date Sampled							25-Aug-10	25-Aug-10	25-Aug-10	25-Aug-10	25-Aug-10	25-Aug-10	25-Aug-10	25-Aug-10	20-Aug-10	20-Aug-10	17-Aug-10	17-Aug-10	17-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	20-Aug-10	20-Aug-10	7-Mar-16
Depth of Sample (m bgs)							1.5-1.8	2.3-2.6	2.6-2.9	1.7-2.15	0.15-0.6	0.15-0.6	1.5-1.8	**3.8-3.95**	0.8-1.4	**3.05-3.66**	0.18-0.31	2.45-2.8	2.45-2.8	0.48-0.6	**3.05-3.35**	**3.05-3.35**	**3.05-3.32**	**3-3.65**	**3-3.65**	1.8-2.1
QA/QC								FDA			FDA	FD	FDA					FDA	FD			FD	FDA	FDA	FD	
APEC																										
Field Parameters																										
Headspace by PID (ppm)																										0.4
Physical Tests																										
% Moisture							12	7.7	5.9	9.1	17	18	12	9	17	9.7	13	8.8	8.6	9.6	7.8	5.7	6.9	7	19	5.7
Hydrocarbons																										
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			< 100	915	574	< 100	**2020**	-	**4470**	508	229	< 100	< 100	111	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			< 100	129	127	< 100	< 100	-	203	130	< 100	< 100	< 100	136	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
LEPH	**1000***	HH/EH	2000	HH/EH			-	911	-	< 100	-	-	**4440**	508	-	< 100	-	110	< 100	-	< 100	< 100	< 100	< 100	< 100	< 100
HEPH	**1000***	HH/EH	5000	HH/EH			-	128	-	< 100	-	-	203	129	-	< 100	-	135	< 100	-	< 100	< 100	< 100	< 100	< 100	< 100
VPH	**200**	HH/EH	200	HH/EH			< 10	**220**	-	-	**630**	**630**	-	-	-	-	-	< 10	-	-	-	-	-	-	-	< 10
VH(C6-C10)	**200***	HH/EH	200	HH/EH			< 10	**260**	-	-	**660**	**650**	-	-	-	-	-	< 10	-	-	-	-	-	-	-	< 10
Polycyclic Aromatic Hydrocarbons (PAHs)																										
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	-	< 0.039	-	< 0.010	-	-	< 0.28	< 0.044	-	< 0.010	-	< 0.010	< 0.020	-	< 0.010	< 0.020	< 0.010	< 0.010	< 0.010	< 0.0050
Acenaphthylene					320	AW	-	< 0.044	-	< 0.010	-	-	< 0.20	< 0.018	-	< 0.010	-	< 0.010	< 0.010	-	< 0.010	< 0.020	< 0.010	< 0.010	< 0.010	< 0.0050
Anthracene	**2.5**	T	30	T	2.5	SC	-	< 0.019	-	< 0.010	-	-	< 0.010	< 0.010	-	< 0.010	-	< 0.010	< 0.010	-	< 0.010	< 0.020	< 0.010	< 0.010	< 0.010	< 0.0040
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	-	0.027	-	< 0.010	-	-	< 0.010	0.023	-	0.013	-	0.037	0.031	-	0.028	0.035	0.021	0.02	0.027	< 0.020
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	-	0.037	-	< 0.010	-	-	< 0.010	0.051	-	0.012	-	0.046	0.041	-	0.035	0.056	0.023	0.019	0.039	< 0.020
Benzo(b)fluoranthene					0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene							-	0.22	-	0.047	-	-	0.087	0.4	-	0.12	-	0.3	0.33	-	0.23	0.31	0.18	0.18	0.27	< 0.050
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	-	< 0.010	-	< 0.010	-	-	< 0.010	< 0.010	-	< 0.010	-	0.018	0.017	-	0.017	0.018	0.016	0.014	0.026	< 0.020
Benzo[j]fluoranthene		EH					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**400**	HH	4500	HH	6.2	EI	-	0.12	-	0.021	-	-	0.026	0.088	-	0.12	-	0.25	0.21	-	0.19	0.21	0.19	0.15	0.21	0.023
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	-	< 0.020	-	< 0.020	-	-	< 0.020	0.035	-	< 0.020	-	< 0.020	0.034	-	0.026	0.034	0.025	0.022	0.032	< 0.050
Fluoranthene	**50**	T	200	T	15.4	EI	-	0.034	-	< 0.010	-	-	0.032	0.068	-	0.03	-	0.073	0.064	-	0.058	0.067	0.055	0.038	0.05	< 0.020
B[a]P TPE					5.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.10
Benzo(b+j)fluoranthene	**1**	EH	10	EH			-	0.061	-	0.051	-	-	0.053	0.11	-	0.075	-	0.16	0.12	-	0.1	0.12	0.1	0.088	0.13	0.023
Fluorene	**1000**	HH	9500	HH	0.25	AW	-	0.34	-	< 0.010	-	-	1.2	0.22	-	< 0.010	-	< 0.010	< 0.020	-	< 0.010	< 0.020	< 0.010	< 0.010	< 0.010	< 0.020
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	-	0.024	-	< 0.020	-	-	< 0.020	0.038	-	< 0.020	-	0.03	0.036	-	0.029	0.037	0.022	0.022	0.033	< 0.050
IACR					1.0		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4
Naphthalene	**0.6**	T	20	T	0.013	AW	-	**2.8**	-	0.027	-	-	**30**	< 0.21	-	0.045	-	0.15	0.15	-	0.13	0.21	0.085	0.074	0.12	< 0.010
Phenanthrene	**5**	EH	50	EH	0.046	AW	-	0.59	-	0.051	-	-	1.4	0.57	-	0.15	-	0.43	0.4	-	0.47	0.63	0.46	0.2	0.33	0.034
Pyrene	**10**	EH	100	HH	0.1	EI	-	0.085	-	0.011	-	-	0.035	0.14	-	0.032	-	0.13	0.11	-	0.097	0.13	0.066	0.068	0.11	< 0.020
Quinoline	**4.5**	HH	10	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	**100**	HH	950	HH			-	7.4	-	0.019	-	-	59	1.5	-	0.053	-	0.3	0.28	-	0.25	0.51	0.11	0.14	0.23	< 0.020
1-Methylnaphthalene	**500**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Molecular Weight PAHs							-	11	-	0.097	-	-	92	2.3	-	0.25	-	0.88	0.83	-	0.85	1.4	0.65	0.42	0.68	< 0.050
High Molecular Weight PAHs							-	0.61	-	0.13	-	-	0.23	0.95	-	0.4	-	1	1	-	0.81	1	0.69	0.62	0.92	< 0.050
Total PAHs							-	12	-	0.23	-	-	92	3.3	-	0.65	-	1.9	1.8	-	1.7	2.4	1.3	1	1.6	0.08

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_{ss}(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30 Exceeds CSR WLR (<3m) standard
30 Exceeds CSR IL (>3m) standard
23 Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_R (< 3m) $Stage10_3$	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-MW16-02	K19-MW16-03	K19-MW16-03	K19-MW16-04	K19-MW16-04	K19-MW16-05	K19-MW16-06	K19-MW16-07	K19-MW16-08	K19-MW16-08	K19-MW16-09	K19-MW16-09	K19-MW16-09	K19-MW16-10	K19-MW16-11	K19-MW16-12	K19-MW16-13	K19-MW16-14	K19-MW16-15	K19-MW16-15
Sample Control Number							K19-MW16-02/SA2	K19-MW16-03/SA1	K19-MW16-03/SA2	K19-MW16-04/SA1	K19-MW16-04/SA2	K19-MW16-05/SA2	K19-MW16-06/SA2	K19-MW16-07/SA1	K19-MW16-08/SA1	K19-MW16-08/SA2	K19-MW16-09/SA1	K19-MW16-09/SA2	K19-MW16-09/SA2 (DUPE)	K19-MW16-10/SA1	K19-MW16-11/SA1	K19-MW16-12/SA1	K19-MW16-13/SA2	K19-MW16-14/SA2	K19-MW16-15/SA1	K19-MW16-15/SA2
Laboratory Report Number							B619198	B619198	B619198	B619198	B619198	B619203	B619203	B619203	B619935	B619935	B619935	B619935	B619935	B619935	B619935	B619935	B620735	B620735	B620735	B620735
Date Sampled							8-Mar-16	8-Mar-16	8-Mar-16	9-Mar-16	9-Mar-16	9-Mar-16	10-Mar-16	10-Mar-16	11-Mar-16	11-Mar-16	11-Mar-16	11-Mar-16	11-Mar-16	12-Mar-16	13-Mar-16	13-Mar-16	14-Mar-16	14-Mar-16	14-Mar-16	14-Mar-16
Depth of Sample (m bgs)							1.8-2.1	0.9-1.2	1.5-1.8	0.8-1.1	2.0-2.6	2.7-3.0	1.5	0.8-1.1	1.2-1.5	2.4-2.7	0.6-0.9	2.1-2.4 FDA	2.1-2.4 FD	0.9-1.2	Unknown	0.8-1.2	1.2-1.5	1.5-1.7	0.5-1.1	1.8-2.1
QA/QC																										
APEC																										
Field Parameters																										
Headspace by PID (ppm)							0.6	0.4	0.1	1.1	564	0	46.7	0	0	0	0	259	259	0.1	0	0.4	0	0.7	160.1	51.9
Physical Tests																										
% Moisture							-	6.8	5.5	12	9.9	11	6.9	15	17	14	18	12	15	7.6	15	14	8	7.8	15	17
Hydrocarbons																										
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			**4890**	< 100	< 100	< 100	**4250**	102	447	< 100	< 100	< 100	< 100	**4430**	**2180**	< 100	< 100	< 100	< 100	< 100	**5380**	< 100
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			291	< 100	103	< 100	291	123	136	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	166	< 100	186	< 100
LEPH	**1000***	HH/EH	2000	HH/EH			**4890**	< 100	< 100	< 100	**4250**	102	445	< 100	< 100	< 100	< 100	**4430**	**2170**	< 100	< 100	< 100	< 100	< 100	**5380**	< 100
HEPH	**1000***	HH/EH	5000	HH/EH			291	< 100	103	< 100	291	123	136	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	166	< 100	186	< 100
VPH	**200**	HH/EH	200	HH/EH			**270**	< 10	< 10	-	**520**	14	150	< 10	< 10	-	-	**280**	**230**	< 12	< 10	< 10	< 10	< 10	31	13
VH(C6-C10)	**200***	HH/EH	200	HH/EH			**270**	< 10	< 10	-	**550**	14	160	< 10	< 10	-	-	**290**	**230**	< 12	< 10	< 10	< 10	< 10	31	13
Polycyclic Aromatic Hydrocarbons (PAHs)																										
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	0.35	< 0.0050	< 0.0050	< 0.0050	0.085	< 0.050	< 0.050	< 0.050	< 0.0050	< 0.0050	< 0.0050	0.27	0.091	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.037	< 0.0050
Acenaphthylene					320	AW	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.050	< 0.050	< 0.050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0078	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.53	< 0.0050
Anthracene	**2.5**	T	30	T	2.5	SC	< 0.028	< 0.0040	< 0.0040	< 0.0040	< 0.0063	< 0.050	< 0.050	< 0.050	< 0.0040	< 0.0040	< 0.0040	0.015	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.042	0.03
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.050	< 0.050	< 0.050	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.022	< 0.020
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	< 0.020	< 0.020	< 0.020	< 0.020	0.035	< 0.050	< 0.050	< 0.050	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Benzo(b)fluoranthene					0.1	AL	-	-	-	-	-	0.065	0.055	< 0.050	< 0.020	0.032	-	0.032	0.025	< 0.020	0.029	0.024	-	-	-	-
Benzo(g,h,i)perylene							< 0.050	< 0.050	< 0.050	< 0.050	0.19	0.20	0.17	0.062	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	0.054	< 0.050	< 0.050	< 0.050
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.050	< 0.050	< 0.050	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Benzo[j]fluoranthene		EH					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**400**	HH	4500	HH	6.2	EI	0.048	0.056	0.053	0.035	0.15	0.15	0.12	< 0.050	< 0.020	0.035	< 0.020	0.057	0.037	0.023	0.026	0.029	0.06	0.039	0.042	0.027
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Fluoranthene	**50**	T	200	T	15.4	EI	< 0.020	< 0.020	< 0.020	< 0.020	0.054	0.051	< 0.050	< 0.050	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.11	< 0.020
B[a]P TPE					5.3		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	-	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(b+j)fluoranthene	**1**	EH	10	EH			0.036	0.034	0.033	0.032	0.065	0.065	0.055	< 0.050	< 0.020	0.032	< 0.020	0.032	0.025	< 0.020	0.029	0.025	0.032	< 0.026	0.023	0.027
Fluorene	**1000**	HH	9500	HH	0.25	AW	1.1	< 0.020	< 0.020	< 0.020	0.75	< 0.050	0.25	< 0.050	< 0.020	< 0.020	< 0.020	0.76	0.41	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.083	< 0.020
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
IACR					1.0		0.49	0.48	0.47	0.46	0.81	-	-	-	0.31	0.46	0.31	0.47	0.42	0.31	0.43	0.41	0.47	0.34	0.44	0.43
Naphthalene	**0.6**	T	20	T	0.013	AW	**5.5**	0.014	0.014	< 0.010	**5.8**	< 0.050	**0.86**	< 0.050	< 0.010	< 0.010	< 0.010	**7.3**	**3.7**	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.12	0.21
Phenanthrene	**5**	EH	50	EH	0.046	AW	0.87	0.07	0.068	0.033	0.78	0.26	0.56	< 0.050	< 0.010	0.026	< 0.010	0.41	0.23	0.023	0.01	< 0.010	0.055	0.047	< 0.087	0.029
Pyrene	**10**	EH	100	HH	0.1	EI	0.025	< 0.020	< 0.020	< 0.020	0.11	0.11	0.086	< 0.050	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.11	< 0.020
Quinoline	**4.5**	HH	10	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	**100**	HH	950	HH			14	0.027	0.026	< 0.020	19	0.11	3.1	< 0.050	< 0.020	< 0.020	< 0.020	1.3	0.6	< 0.020	< 0.020	< 0.020	0.021	< 0.020	< 0.095	0.031
1-Methylnaphthalene	**500**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Molecular Weight PAHs							22	0.11	0.11	< 0.050	26	0.37	4.8	< 0.050	< 0.050	< 0.050	< 0.050	10	5	< 0.050	< 0.050	< 0.050	0.075	< 0.050	< 6.9	0.3
High Molecular Weight PAHs							0.11	0.09	0.086	0.067	0.6	0.58	0.43	0.062	< 0.050	0.067	< 0.050	0.088	0.063	< 0.050	0.055	0.054	0.15	< 0.050	0.31	0.054
Total PAHs							22	0.2	0.19	0.1	27	0.95	5.2	0.062	< 0.050	0.093	< 0.050	10	5.1	< 0.050	0.065	0.054	0.22	0.086	< 6.9	0.36

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_w(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.
Italics = indicates that the detection limit exceeds one or more criteria.
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-TP16-01	K19-TP16-01	K19-TP16-02	K19-TP16-03	K19-TP16-04	K19-TP16-05	K19-TP16-06	K19-TP16-07	K19-TP16-07	K19-TP16-09	K19-TP16-09	K19-TP16-10	K19-TP16-11	K19-TP16-11	K19-TP16-12	K19-TP16-12	K19-TP16-12	K19-TP16-13	K19-TP16-13	K19-TP16-14
Sample Control Number							K19-TP16-01/SA2	K19-TP16-01/SA3	K19-TP16-02/SA2	K19-TP16-03/SA2	K19-TP16-04/SA2	K19-TP16-05/SA1	K19-TP16-06/SA2	K19-TP16-07/SA2	K19-TP16-07/SA2-DUP	K19-TP16-09/SA2	K19-TP16-09/SA3	K19-TP16-10/SA2	K19-TP16-11/SA2	K19-TP16-11/SA2 DUP	01463-02	01463-04	01463-03	01463-08	01463-09	01463-12
Laboratory Report Number							B619198	B619198	B619198	B619198	B619198	B619198	B619198	B619198	B619198	B619206	B619206	B619206	B619206	B619206	B674520	B674520	B674520	B674520	B674520	B674520
Date Sampled							6-Mar-16	6-Mar-16	7-Mar-16	7-Mar-16	8-Mar-16	8-Mar-16	8-Mar-16	9-Mar-16	9-Mar-16	9-Mar-16	9-Mar-16	10-Mar-16	10-Mar-16	10-Mar-16	29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16
Depth of Sample (m bgs)							2.0	**3.6**	1.5	2.9	2.2	1.9	2.4	1.5	1.5	1.9	2.8	1.9	2.0	2.0	1.5	2.0	2.9	2.2	**3.1**	0.9
QA/QC														FDA	FD				FDA	FD						
APEC																										
Field Parameters																										
Headspace by PID (ppm)							89.2	84.3	0.2	0.2	0.2	0.2	0.4	15.8	15.8	288.4	92.1	0.3	0.1	0.1	5.21	267.6	157	22	55.8	199
Physical Tests																										
% Moisture							9	9.6	8.5	9.1	12	13	19	14	14	18	18	12	14	15	6.5	6.8	5.8	8.3	8	11
Hydrocarbons																										
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	**750**	-	-	-	-	-	-	-	-	-	-	-	-	120	190	**210**	32	87	**240**
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	**750**	-	-	-	-	-	-	-	-	-	-	-	-	120	190	**210**	32	87	**240**
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			**2900**	1870	< 100	< 100	< 100	< 100	< 100	< 100	133	404	798	< 100	< 100	< 100	**1700**	**8900**	**4200**	580	-	**4300**
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			231	391	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	130	410	280	< 100	-	620
LEPH	**1000***	HH/EH	2000	HH/EH			**2900**	1870	< 100	< 100	< 100	< 100	< 100	< 100	133	404	797	< 100	< 100	< 100	**1700**	**8900**	**4200**	580	-	**4300**
HEPH	**1000***	HH/EH	5000	HH/EH			231	391	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	130	410	280	< 100	-	620
VPH	**200**	HH/EH	200	HH/EH			**230**	**720**	< 10	< 10	12	< 10	< 10	< 10	11	-	69	< 10	< 10	< 10	110	150	180	24	78	200
VH(C6-C10)	**200***	HH/EH	200	HH/EH			**230**	**720**	< 10	< 10	12	< 10	< 10	10	11	-	71	< 10	< 10	< 10	110	150	190	24	79	200
Polycyclic Aromatic Hydrocarbons (PAHs)																										
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	0.11	0.21	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.050	0.051	< 0.050	< 0.050	< 0.050	0.13	0.64	0.42	0.035	-	0.058
Acenaphthylene					320	AW	< 0.0050	< 0.019	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	0.041	0.17	0.11	0.0095	-	0.011
Anthracene	**2.5**	T	30	T	2.5	SC	< 0.012	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	0.005	0.018	0.034	< 0.0040	-	0.013
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.15	< 0.050	< 0.050	< 0.050	< 0.050	< 0.020	< 0.020	< 0.020	< 0.020	-	< 0.020
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.1	< 0.050	< 0.050	< 0.050	< 0.050	< 0.020	< 0.020	< 0.020	< 0.020	-	< 0.020
Benzo(b)fluoranthene					0.1	AL	-	-	-	-	-	-	-	-	-	0.13	< 0.050	< 0.050	< 0.050	< 0.050	< 0.020	0.027	0.034	0.025	-	< 0.020
Benzo(g,h,i)perylene							< 0.050	0.096	< 0.050	< 0.050	0.059	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	0.055	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.055	< 0.050	< 0.050	< 0.050	< 0.050	< 0.020	< 0.020	< 0.020	< 0.020	-	< 0.020
Benzo[j]fluoranthene		EH					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**400**	HH	4500	HH	6.2	EI	0.09	0.11	0.043	0.041	0.062	0.034	0.044	0.022	0.022	0.13	< 0.050	< 0.050	< 0.050	0.053	< 0.020	< 0.020	0.025	< 0.020	-	< 0.020
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050
Fluoranthene	**50**	T	200	T	15.4	EI	< 0.020	0.027	< 0.020	< 0.020	0.02	< 0.020	< 0.020	< 0.020	< 0.020	0.26	< 0.050	< 0.050	< 0.050	< 0.050	< 0.020	0.038	0.024	< 0.020	-	< 0.020
B[a]P TPE					5.3		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	-	-	-	-	0.041	0.043	0.043	0.042	-	0.041
Benzo(b+j)fluoranthene	**1**	EH	10	EH			0.047	0.053	0.031	0.028	0.033	0.03	0.037	0.023	0.024	0.2	< 0.050	< 0.050	< 0.050	< 0.050	< 0.020	0.027	0.034	0.025	-	< 0.020
Fluorene	**1000**	HH	9500	HH	0.25	AW	0.74	0.4	< 0.020	< 0.020	0.023	< 0.020	< 0.020	< 0.020	< 0.020	< 0.050	0.2	< 0.050	< 0.050	< 0.050	0.29	1.8	0.96	0.067	-	0.07
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050
IACR					1.0		0.58	0.63	0.46	0.44	0.48	0.45	0.49	0.4	0.4	-	-	-	-	-	0.31	0.41	0.47	0.41	-	0.31
Naphthalene	**0.6**	T	20	T	0.013	AW	**2.1**	0.96	< 0.010	< 0.010	< 0.010	< 0.010	0.013	0.056	0.053	0.075	**1.7**	< 0.050	< 0.050	< 0.050	**3.2**	**9.6**	**5.3**	0.029	-	0.086
Phenanthrene	**5**	EH	50	EH	0.046	AW	0.5	0.22	0.038	0.049	0.13	0.035	0.044	0.03	0.034	0.059	0.1	< 0.050	< 0.050	< 0.050	0.17	1.4	0.66	0.1	-	0.026
Pyrene	**10**	EH	100	HH	0.1	EI	0.045	0.065	< 0.020	< 0.020	0.043	< 0.020	0.02	< 0.020	< 0.020	0.28	< 0.050	< 0.050	< 0.050	< 0.050	< 0.020	0.066	0.03	< 0.020	-	0.046
Quinoline	**4.5**	HH	10	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	**100**	HH	950	HH			7.2	3.5	< 0.020	0.021	0.027	< 0.020	< 0.020	0.15	0.19	0.24	5.2	< 0.050	< 0.050	< 0.050	3.5	37	6.1	0.068	-	0.27
1-Methylnaphthalene	**500**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Molecular Weight PAHs							11	5.3	< 0.050	0.07	0.18	< 0.050	0.056	0.24	0.28	0.38	7.2	< 0.050	< 0.050	< 0.050	7.3	52	14	0.31	-	1
High Molecular Weight PAHs							0.18	0.35	0.074	0.069	0.22	0.064	0.1	< 0.050	< 0.050	1.2	< 0.050	< 0.050	0.11	< 0.050	< 0.050	0.13	0.11	< 0.050	-	< 0.050
Total PAHs							11	5.6	0.11	0.14	0.4	0.099	0.16	0.29	0.33	1.6	7.2	< 0.050	0.11	< 0.050	7.3	52	14	0.33	-	1.1

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_n(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-TP16-14	K19-TP16-14	K19-TP16-14	K19-TP16-15	K19-TP16-15	K19-TP16-15	K19-TP16-16	K19-TP16-16	K19-TP16-17	K19-TP16-18	K19-TP16-19	K19-TP16-20	K19-TP16-20	K19-TP16-21	K19-TP16-22	K19-TP16-23	K19-TP16-23	K19-TP16-24	K19-TP16-24	K19-TP16-25
Sample Control Number							01464-01	01464-04	01464-06	01465-01	01465-02	01465-03	01465-06	01465-08	01465-10	01466-02	01466-08	01480-02	01480-04	01480-07	01481-04	01481-05	01481-07	01482-03	01482-05	01482-08
Laboratory Report Number							B674520	B674520	B674520	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675549	B675549	B675549	B675549	B675549	B675549
Date Sampled							29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16	30-Aug-16	30-Aug-16	30-Aug-16	30-Aug-16	30-Aug-16	30-Aug-16	30-Aug-16	30-Aug-16	30-Aug-16	31-Aug-16	31-Aug-16	31-Aug-16
Depth of Sample (m bgs)							2.0	**3.6**	**3.6**	2.1	**3.0**	**3.7**	1.0	2.0	1.0	1.0	1.0	2.9	**3.8**	2.0	2	0.5	1.5	2.5	2.5	1.6
QA/QC								FDA	FD															FDA	FD	
APEC	BC CSR Standards for WL_R (< 3m) $Stage10_3$	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes																				
Field Parameters																										
Headspace by PID (ppm)							102.3	12.1	12.1	144.2	30.7	6.5	0.7	106.7	0	0.3	0	134.3	390	0.6	0.5	0.8	0.8	7.4	7.4	6.5
Physical Tests																										
% Moisture							6.4	7.5	8.3	6.9	7.3	4.9	11	11	10	15	11	10	6.1	8.6	10	16	14	21	21	12
Hydrocarbons																										
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	10	10	79	81	-	-	100	< 10	< 10	< 10	110	**300**	< 10	<10	<10	<10	82	<10	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	10	10	80	81	-	-	100	< 10	< 10	< 10	110	**300**	< 10	<10	<10	<10	82	<10	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			**2900**	-	-	**1700**	-	370	< 100	**5400**	< 100	< 100	< 100	**4100**	1800	< 100	160	<100	<100	**2400**	**1400**	<100
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			110	-	-	150	-	510	< 100	290	< 100	< 100	< 100	260	350	< 100	290	<100	<100	370	300	<100
LEPH	**1000***	HH/EH	2000	HH/EH			**2900**	-	-	**1700**	-	370	< 100	**5400**	< 100	< 100	< 100	**4100**	1800	< 100	160	<100	<100	**2400**	**1400**	<100
HEPH	**1000***	HH/EH	5000	HH/EH			110	-	-	150	-	510	< 100	290	< 100	< 100	< 100	260	350	< 100	290	<100	<100	370	300	<100
VPH	**200**	HH/EH	200	HH/EH			-	< 10	< 10	72	78	-	-	80	< 10	< 10	< 10	110	**260**	< 10	<10	<10	<10	73	<10	-
VH(C6-C10)	**200***	HH/EH	200	HH/EH			-	< 10	< 10	72	79	-	-	80	< 10	< 10	< 10	110	**260**	< 10	<10	<10	<10	73	<10	-
Polycyclic Aromatic Hydrocarbons (PAHs)																										
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	0.41	-	-	0.14	-	0.017	< 0.0050	0.18	0.0066	< 0.0050	0.0086	0.47	0.18	0.011	<0.0050	<0.0050	<0.0050	0.073	0.12	<0.0050
Acenaphthylene					320	AW	0.082	-	-	< 0.0050	-	< 0.0050	< 0.0050	0.057	< 0.0050	< 0.0050	< 0.0050	0.24	0.035	< 0.0050	<0.0050	<0.0050	<0.0050	0.012	<0.0050	<0.0050
Anthracene	**2.5**	T	30	T	2.5	SC	< 0.0040	-	-	0.014	-	< 0.0040	< 0.0040	0.017	< 0.0040	< 0.0040	< 0.0040	0.028	0.005	< 0.0040	<0.0040	<0.0040	<0.0040	0.0059	<0.0040	<0.0040
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	< 0.020	-	-	< 0.020	-	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	< 0.020	-	-	< 0.020	-	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(b)fluoranthene					0.1	AL	0.021	-	-	0.023	-	0.043	< 0.020	0.02	0.026	0.02	0.03	0.04	0.047	0.023	0.056	<0.020	0.038	<0.020	<0.020	0.025
Benzo(g,h,i)perylene							< 0.050	-	-	< 0.050	-	0.086	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	0.075	< 0.050	0.092	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	< 0.020	-	-	< 0.020	-	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo[j]fluoranthene		EH					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**400**	HH	4500	HH	6.2	EI	< 0.020	-	-	0.033	-	0.1	< 0.020	0.026	0.03	< 0.020	0.044	0.064	0.11	0.031	0.026	<0.020	<0.020	<0.020	<0.020	<0.020
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	< 0.050	-	-	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Fluoranthene	**50**	T	200	T	15.4	EI	< 0.020	-	-	< 0.020	-	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.024	< 0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
B[a]P TPE					5.3		0.042	-	-	0.042	-	0.046	0.041	0.042	0.043	0.042	0.043	0.044	0.046	0.042	0.046	0.041	0.044	0.041	0.041	0.042
Benzo(b+j)fluoranthene	**1**	EH	10	EH			0.021	-	-	0.023	-	0.043	< 0.020	0.02	0.026	0.02	0.03	0.04	0.047	0.023	0.056	<0.020	0.038	<0.020	<0.020	0.025
Fluorene	**1000**	HH	9500	HH	0.25	AW	0.69	-	-	0.38	-	0.04	< 0.020	0.71	< 0.020	< 0.020	< 0.020	0.82	0.36	< 0.020	<0.020	<0.020	<0.020	0.089	0.061	<0.020
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	< 0.050	-	-	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
IACR					1.0		0.38	-	-	0.4	-	0.57	0.31	0.38	0.42	0.37	0.45	0.52	0.59	0.4	0.62	0.31	0.48	0.31	0.31	0.4
Naphthalene	**0.6**	T	20	T	0.013	AW	**7.1**	-	-	0.37	-	0.017	< 0.010	**3.9**	< 0.010	< 0.010	< 0.010	**3.3**	**2.1**	< 0.010	<0.010	<0.010	<0.010	0.16	0.067	<0.010
Phenanthrene	**5**	EH	50	EH	0.046	AW	0.16	-	-	0.35	-	0.091	0.015	0.53	0.037	0.017	0.052	0.64	0.34	0.041	0.033	<0.010	0.045	0.053	0.046	0.024
Pyrene	**10**	EH	100	HH	0.1	EI	< 0.020	-	-	< 0.020	-	0.048	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.029	0.054	< 0.020	0.046	<0.020	<0.020	0.027	0.023	<0.020
Quinoline	**4.5**	HH	10	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	**100**	HH	950	HH			25	-	-	0.26	-	0.055	< 0.020	2.4	< 0.020	< 0.020	< 0.020	5.6	2.9	< 0.020	<0.020	<0.020	<0.020	0.32	0.22	<0.020
1-Methylnaphthalene	**500**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Molecular Weight PAHs							34	-	-	1.5	-	0.22	< 0.050	7.8	< 0.050	< 0.050	0.061	11	5.9	0.052	<0.050	<0.050	<0.050	0.71	0.51	<0.050
High Molecular Weight PAHs							< 0.050	-	-	0.057	-	0.28	< 0.050	< 0.050	0.056	< 0.050	0.075	0.13	0.31	0.054	0.22	<0.050	<0.050	<0.050	<0.050	<0.050
Total PAHs							34	-	-	1.6	-	0.5	< 0.050	7.8	0.1	< 0.050	0.14	11	6.2	0.11	0.25	<0.050	0.082	0.74	0.54	<0.050

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

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Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_n(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
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23	Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

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Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-TP16-25	K19-TP16-26	K19-TP16-26	K19-TP16-27	K19-TP16-27	K19-TP16-27	K19-TP16-28	K19-TP16-28	K19-TP16-29	K19-TP16-29	K19-TP16-29	K19-TP16-30	K19-TP16-30	K19-TP16-30	K19-TP16-30	K19-TP16-31	K19-TP16-31	K19-TP16-32	K19-TP16-32	K19-TP16-32
Sample Control Number							01482-10	01482-12	01483-02	01483-03	01483-04	01483-06	01484-02	01484-04	01484-07	01484-11	01484-12	01485-01	01485-04	01485-06	01485-07	01485-08	01485-11	01486-02	01486-03	01486-05
Laboratory Report Number	BC CSR Standards for WL_R (< 3m) $Stage10_3$	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	B675549	B675549	B675549	B675549	B675549	B675549	B675954	B675954	B675954	B675954	B675954	B675954	B675954	B675954	B675954	B675954	B675954	B676013	B676013	B676013
Date Sampled							31-Aug-16	31-Aug-16	31-Aug-16	31-Aug-16	31-Aug-16	31-Aug-16	31-Aug-16	31-Aug-16	1-Sep-16	1-Sep-16	1-Sep-16	1-Sep-16	1-Sep-16	1-Sep-16	1-Sep-16	1-Sep-16	1-Sep-16	1-Sep-16	1-Sep-16	1-Sep-16
Depth of Sample (m bgs)							**3.6**	2.1	2.5	0.4	1.5	**3.5**	1.5	**3.0**	1.0	**3.8**	**4.3**	1.0	2.9	**3.8**	**4.3**	0.9	2.8	2.0	2.9 FDA	2.9 FD
QA/QC																										
APEC																										
Field Parameters																										
Headspace by PID (ppm)							0.5	0.7	22.8	0.8	1.1	0.7	46.6	79	0.1	269.6	169.9	1184	1646	1511	525.3	1.8	5.3	189	169.3	169.3
Physical Tests																										
% Moisture							7.2	20	17	20	13	11	16	8.6	17	9.6	7.9	11	19	9.8	6.3	16	4	13	11	10
Hydrocarbons																										
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		29	<10	69	<10	<10	19	36	30	< 10	250	110	**3300**	**6800**	**1700**	**780**	< 10	15	-	-	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		29	<10	71	<10	<10	19	37	-	< 10	270	120	**3600**	**7200**	-	**840**	< 10	15	-	-	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	**4300**	**1900**	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	650	160	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	290	68	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			<100	<100	150	<100	<100	<100	690	290	< 100	400	300	**4700**	**1600**	-	600	< 100	130	**5800**	-	**2200**
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			<100	<100	140	<100	<100	<100	< 100	110	< 100	380	460	510	130	-	370	< 100	120	230	-	210
LEPH	**1000***	HH/EH	2000	HH/EH			<100	<100	150	<100	<100	<100	690	290	< 100	400	300	**4700**	**1600**	-	590	< 100	130	**5700**	-	**2200**
HEPH	**1000***	HH/EH	5000	HH/EH			<100	<100	130	<100	<100	<100	< 100	110	< 100	380	460	510	130	-	370	< 100	120	230	-	210
VPH	**200**	HH/EH	200	HH/EH			26	<10	58	<10	<10	17	33	26	< 10	230	91	**3200**	**6100**	**1400**	**690**	< 10	14	**220**	**210**	-
VH(C6-C10)	**200***	HH/EH	200	HH/EH			26	<10	60	<10	<10	17	34	-	< 10	250	98	**3400**	**6600**	-	**750**	< 10	14	**220**	**220**	-
Polycyclic Aromatic Hydrocarbons (PAHs)																										
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	0.049	<0.0050	0.020	<0.0050	<0.0050	0.022	0.027	0.041	< 0.0050	0.016	0.013	0.022	0.018	-	0.013	< 0.0050	0.032	0.24	-	0.13
Acenaphthylene					320	AW	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.007	0.0066	< 0.0050	< 0.0050	< 0.0050	0.0066	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050	0.21	-	< 0.050
Anthracene	**2.5**	T	30	T	2.5	SC	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.0056	0.0067	< 0.0040	< 0.0040	< 0.0040	0.0072	0.012	-	0.0041	< 0.0040	< 0.0040	< 0.050	-	< 0.050
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	-	< 0.020	< 0.020	< 0.020	< 0.050	-	< 0.050
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	0.023	<0.020	<0.020	<0.020	<0.020	<0.020	< 0.020	0.027	< 0.020	0.023	0.022	< 0.020	< 0.020	-	0.021	< 0.020	< 0.020	< 0.050	-	< 0.050
Benzo(b)fluoranthene					0.1	AL	0.042	0.025	0.049	<0.020	0.02	0.031	0.026	0.056	< 0.020	0.076	0.059	< 0.020	< 0.020	-	0.053	0.025	0.036	< 0.050	-	0.056
Benzo(g,h,i)perylene							0.11	<0.050	0.11	<0.050	<0.050	0.076	< 0.050	0.13	< 0.050	0.12	0.1	< 0.050	< 0.050	-	0.11	< 0.050	0.091	< 0.050	-	0.12
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	-	< 0.020	< 0.020	< 0.020	< 0.050	-	< 0.050
Benzo[j]fluoranthene		EH					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**400**	HH	4500	HH	6.2	EI	0.1	<0.020	0.12	<0.020	<0.020	0.071	< 0.020	0.037	< 0.020	0.048	0.055	< 0.020	< 0.020	-	0.066	< 0.020	0.034	0.061	-	< 0.050
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050
Fluoranthene	**50**	T	200	T	15.4	EI	0.033	<0.020	0.044	<0.020	<0.020	0.022	< 0.020	0.039	< 0.020	0.034	0.036	< 0.020	0.023	-	0.03	< 0.020	0.026	< 0.050	-	< 0.050
B[a]P TPE					5.3		0.059	0.042	0.047	0.041	0.042	0.044	0.042	0.064	0.041	0.062	0.059	-	0.041	-	0.058	0.042	0.044	-	-	-
Benzo(b+j)fluoranthene	**1**	EH	10	EH			0.042	0.025	0.049	<0.020	0.02	0.031	0.026	0.056	< 0.020	0.076	0.059	< 0.020	< 0.020	-	0.053	0.025	0.036	< 0.050	-	0.056
Fluorene	**1000**	HH	9500	HH	0.25	AW	0.14	<0.020	<0.020	<0.020	<0.020	0.078	0.064	0.15	< 0.020	0.035	0.026	0.092	0.038	-	0.026	< 0.020	0.15	0.78	-	0.35
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050
IACR					1.0		0.6	0.4	0.62	0.31	0.37	0.48	0.41	0.67	0.31	0.79	0.68	0.31	0.31	-	0.65	0.4	0.49	-	-	-
Naphthalene	**0.6**	T	20	T	0.013	AW	0.19	<0.010	<0.010	<0.010	<0.010	0.027	0.32	0.33	< 0.010	1.8	0.29	**26**	**11**	-	2.6	< 0.010	0.027	**6.1**	-	**1.2**
Phenanthrene	**5**	EH	50	EH	0.046	AW	0.37	0.023	0.1	<0.010	0.02	0.2	0.11	0.36	< 0.010	0.13	0.1	0.092	0.067	-	0.12	0.028	0.35	0.93	-	0.42
Pyrene	**10**	EH	100	HH	0.1	EI	0.068	<0.020	0.093	<0.020	<0.020	0.051	< 0.020	0.081	< 0.020	0.095	0.078	< 0.020	< 0.020	-	0.07	< 0.020	0.055	< 0.050	-	0.11
Quinoline	**4.5**	HH	10	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	**100**	HH	950	HH			0.71	<0.020	<0.020	<0.020	<0.020	0.24	0.21	0.86	< 0.020	0.51	0.089	9.2	4.2	-	1.2	< 0.020	0.27	1.4	-	3.2
1-Methylnaphthalene	**500**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Molecular Weight PAHs							1.5	<0.050	0.12	<0.050	<0.050	0.56	0.75	1.8	< 0.050	2.5	0.52	-	15	-	4	< 0.050	0.83	9.7	-	5.3
High Molecular Weight PAHs							0.38	<0.050	0.42	<0.050	<0.050	0.25	< 0.050	0.37	< 0.050	0.4	0.35	-	< 0.050	-	0.35	< 0.050	0.24	0.061	-	0.29
Total PAHs							1.8	<0.050	0.54	<0.050	<0.050	0.82	0.78	2.1	< 0.050	2.9	0.87	-	15	-	4.4	0.052	1.1	9.7	-	5.6

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_n(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-TP16-33	K19-TP16-34	K19-TP16-34	K19-TP16-35	K19-TP16-35	K19-TP16-35	K19-TP16-35	K19-TP16-36	K19-TP16-36	K19-TP16-37	K19-TP16-38	K19-TP16-39	K19-TP16-39	K19-TP16-40	K19-TP16-40	K19-TP16-41	K19-TP16-41	K19-TP16-42	K19-TP16-42	K19-TP16-43
Sample Control Number	BC CSR Standards for WL_R (< 3m) Stage10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	01486-07	01486-11	01487-02	01487-05	01487-07	01487-08	01487-09	01488-01	01488-04	01488-07	01488-11	01489-05	K19-TP16-39	01489-06	01489-08	01489-12	01490-04	01490-06	01490-08	01490-12
Laboratory Report Number							B676013	B676013	B676013	B676013	B676013	B676013	B676013	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470
Date Sampled							1-Sep-16	2-Sep-16	2-Sep-16	2-Sep-16	2-Sep-16	2-Sep-16	2-Sep-16	2-Sep-16	2-Sep-16	2-Sep-16	3-Sep-16	3-Sep-16	3-Sep-16	3-Sep-16	3-Sep-16	3-Sep-16	3-Sep-16	3-Sep-16	3-Sep-16	3-Sep-16
Depth of Sample (m bgs)							1.0	1.5	**3.4**	2.0	2.0	**3.8**	**4.4**	1.0	2.9	2.5	1.0	2.0	2.0	0.5	1.0	0.7	**4.0**	2.0	**3.5**	1.7
QA/QC										FDA	FD							FDA	FD							
APEC																										
Field Parameters																										
Headspace by PID (ppm)							1.1	88.5	162.3	356	356	1167	981.1	1	1	0.8	0	756.3	756.3	399.1	588.5	0.7	0.7	120.6	29.1	0.7
Physical Tests																										
% Moisture							22	10	13	8.1	8.8	6.3	13	9.6	9.7	23	20	15	13	16	16	1.9	7.1	13	15	16
Hydrocarbons																										
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	<10	<10	<10	-	**540**	**520**	**2100**	**430**	-	-	40	10	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	<10	<10	<10	-	**580**	**550**	**2200**	**430**	-	-	40	10	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	**2500**	**5300**	-	**1800**	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	250	460	-	160	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	20	33	-	13	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			< 100	280	410	510	510	700	-	<100	<100	<100	<100	**2000**	**4700**	**5700**	**1700**	<100	<100	**1400**	110	<100
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			< 100	< 100	230	120	140	140	-	<100	<100	<100	<100	<100	170	140	<100	<100	<100	<100	<100	<100
LEPH	**1000***	HH/EH	2000	HH/EH			< 100	280	400	500	510	690	-	<100	<100	<100	<100	**2000**	**4700**	**5700**	**1700**	<100	<100	**1400**	110	<100
HEPH	**1000***	HH/EH	5000	HH/EH			< 100	< 100	230	120	140	140	-	<100	<100	<100	<100	<100	170	140	<100	<100	<100	<100	<100	<100
VPH	**200**	HH/EH	200	HH/EH			-	-	**610**	-	-	-	**1200**	<10	<10	<10	-	**480**	**460**	**2000**	**390**	-	-	37	<10	-
VH(C6-C10)	**200***	HH/EH	200	HH/EH			-	-	**630**	-	-	-	**1200**	<10	<10	<10	-	**510**	**490**	**2000**	**390**	-	-	37	<10	-
Polycyclic Aromatic Hydrocarbons (PAHs)													-													
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	<0.0050	<0.0050	<0.0050	<0.0050	0.078	0.13	0.14	<0.0050	<0.0050	0.0074	0.043	<0.0050	<0.0050
Acenaphthylene					320	AW	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	<0.0050	<0.0050	<0.0050	<0.0050	0.032	0.047	0.049	0.037	<0.0050	<0.0050	0.014	<0.0050	<0.0050
Anthracene	**2.5**	T	30	T	2.5	SC	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	<0.0040	<0.0040	<0.0040	<0.0040	0.0083	0.015	0.013	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(b)fluoranthene					0.1	AL	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	<0.020	0.024	<0.020	0.02	0.034	0.036	<0.020	<0.020	<0.020	0.022	<0.020	0.028	<0.020
Benzo(g,h,i)perylene							< 0.050	< 0.050	0.063	< 0.050	< 0.050	< 0.050	-	<0.050	<0.050	<0.050	<0.050	<0.050	0.054	<0.050	<0.050	<0.050	0.073	<0.050	<0.050	<0.050
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo[j]fluoranthene		EH					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**400**	HH	4500	HH	6.2	EI	< 0.050	< 0.050	0.094	< 0.050	< 0.050	0.061	-	<0.020	<0.020	<0.020	<0.020	<0.020	0.021	<0.020	<0.020	<0.020	<0.020	<0.020	0.026	<0.020
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Fluoranthene	**50**	T	200	T	15.4	EI	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
B[a]P TPE					5.3		-	-	-	-	-	-	-	0.041	0.042	0.041	0.042	0.043	0.044	0.041	0.041	0.041	0.042	0.041	0.043	0.041
Benzo(b+j)fluoranthene	**1**	EH	10	EH			< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	<0.020	0.024	<0.020	0.02	0.034	0.036	<0.020	<0.020	<0.020	0.022	<0.020	0.028	<0.020
Fluorene	**1000**	HH	9500	HH	0.25	AW	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	<0.020	<0.020	<0.020	<0.020	0.25	0.38	0.29	0.035	<0.020	0.065	0.26	<0.020	<0.020
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
IACR					1.0		-	-	-	-	-	-	-	0.31	0.39	0.31	0.37	0.46	0.48	0.31	0.31	0.31	0.39	0.31	0.43	0.31
Naphthalene	**0.6**	T	20	T	0.013	AW	< 0.050	**2.4**	**2.3**	**3.5**	**3.8**	**4.4**	-	<0.010	<0.010	0.016	<0.010	**6.3**	**19**	**3.8**	0.13	<0.010	0.086	0.023	<0.010	<0.010
Phenanthrene	**5**	EH	50	EH	0.046	AW	< 0.050	< 0.050	0.12	0.061	0.06	0.092	-	0.015	0.038	0.04	0.01	0.2	0.25	0.36	0.065	<0.010	0.16	0.18	0.04	0.011
Pyrene	**10**	EH	100	HH	0.1	EI	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	<0.020	<0.020	<0.020	<0.020	<0.020	0.024	<0.020	<0.020	<0.020	0.035	<0.020	<0.020	<0.020
Quinoline	**4.5**	HH	10	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	**100**	HH	950	HH			< 0.050	0.98	1.2	1.4	1.5	2.1	-	<0.020	<0.020	0.05	<0.020	13	37	16	0.76	<0.020	0.29	0.12	<0.020	<0.020
1-Methylnaphthalene	**500**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Molecular Weight PAHs							< 0.050	3.3	3.6	4.9	5.4	6.6	-	<0.050	<0.050	0.11	<0.050	20	56	21	1	<0.050	0.61	0.65	<0.050	<0.050
High Molecular Weight PAHs							< 0.050	< 0.050	0.16	< 0.050	< 0.050	0.061	-	<0.050	<0.050	<0.050	<0.050	<0.050	0.13	<0.050	<0.050	<0.050	0.13	<0.050	0.055	<0.050
Total PAHs							< 0.050	3.3	3.7	4.9	5.4	6.7	-	<0.050	0.061	0.11	<0.050	20	56	21	1	<0.050	0.74	0.65	0.095	<0.050

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_n(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30 Exceeds CSR WLR (<3m) standard
30 Exceeds CSR IL (>3m) standard
23 Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-TP16-43	K19-TP16-45	K19-TP16-45	K19-TP16-45	K19-TP16-46	K19-TP16-46	K19-TP16-47	K19-TP16-47	K19-TP16-47	K19-TP16-48	K19-TP16-49	K19-TP16-49	K19-TP16-49	K19-SS16-01	K19-SS16-02	K19-SS16-03	K19-SS16-04	K19-TP17-01	K19-TP17-01	K19-TP17-02
Sample Control Number							01491-02	01491-05	01491-06	01491-08	01491-10	01491-12	01492-02	01492-03	01492-05	01492-09	01492-11	01492-12	01493-01	01481-09	01481-10	01481-11	01481-12	03343-03	03343-05	03343-07
Laboratory Report Number							B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B675549	B675549	B675549	B675549	B706358	B706358	B706358
Date Sampled							3-Sep-16	4-Sep-16	4-Sep-16	4-Sep-16	4-Sep-16	4-Sep-16	4-Sep-16	4-Sep-16	4-Sep-16	4-Sep-16	4-Sep-16	4-Sep-16	4-Sep-16	31-Aug-16	31-Aug-16	31-Aug-16	31-Aug-16	22-Jan-17	22-Jan-17	22-Jan-17
Depth of Sample (m bgs)							**3.0**	0.5	1.0	2.0	1.0	2.0	1.7	2.5 FDA	2.5 FD	2.5	2.0	1.7	**3.0**	0.27	0.34	0.40	0.32	2.4	**4.2**	1.8 FDA
QA/QC																										
APEC																										
Field Parameters																										
Headspace by PID (ppm)							1.4	0.4	0.4	0.4	112.3	26	0.4	0.5	0.5	0.7	10.5	3.3	0.5	0	0	0	-	1.1	0.9	0.8
Physical Tests																										
% Moisture							17	17	19	15	27	16	16	16	16	9.4	13	20	8.6	13	17	19	22	14	16	14
Hydrocarbons																										
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		<10	-	<10	<10	62	50	<10	-	-	<10	-	<10	<10	<10	<10	-	<10	< 10	< 10	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		<10	-	<10	<10	62	50	<10	-	-	<10	-	<10	<10	<10	<10	-	<10	< 10	< 10	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	**19000**	170	-	-	-	-	-	-	-	<10	<10	<10	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	**2600**	45	-	-	-	-	-	-	-	21	58	45	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	200	11	-	-	-	-	-	-	-	<10	46	17	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			<100	< 100	-	-	**22000**	140	<100	<100	<100	100	<100	-	<100	<100	<100	<100	<100	< 100	< 100	< 100
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			<100	< 100	-	-	890	<100	<100	<100	<100	190	<100	-	<100	<100	<100	<100	<100	< 100	< 100	< 100
LEPH	**1000***	HH/EH	2000	HH/EH			<100	< 100	-	-	**22000**	140	<100	<100	<100	100	<100	-	<100	<100	<100	<100	<100	< 100	< 100	< 100
HEPH	**1000***	HH/EH	5000	HH/EH			<100	< 100	-	-	890	<100	<100	<100	<100	190	<100	-	<100	<100	<100	<100	<100	< 100	< 100	< 100
VPH	**200**	HH/EH	200	HH/EH			<10	-	<10	<10	56	27	<10	-	-	<10	-	<10	<10	<10	<10	-	<10	< 10	< 10	-
VH(C6-C10)	**200***	HH/EH	200	HH/EH			<10	-	<10	<10	56	27	<10	-	-	<10	-	<10	<10	<10	<10	-	<10	< 10	< 10	-
Polycyclic Aromatic Hydrocarbons (PAHs)																										
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	<0.0050	< 0.0050	-	-	1	0.011	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	< 0.0050	< 0.0050	< 0.0050
Acenaphthylene					320	AW	<0.0050	< 0.0050	-	-	0.55	0.013	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	< 0.0050	< 0.0050	< 0.0050
Anthracene	**2.5**	T	30	T	2.5	SC	<0.0040	< 0.0040	-	-	0.13	0.0056	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	-	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	< 0.0040	< 0.0040	< 0.0040
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	<0.020	< 0.020	-	-	0.3	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	-	<0.020	<0.020	<0.020	<0.020	<0.020	< 0.020	< 0.020	< 0.020
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	<0.020	< 0.020	-	-	0.31	0.069	<0.020	<0.020	<0.020	<0.020	<0.020	-	<0.020	<0.020	<0.020	<0.020	<0.020	< 0.020	< 0.020	< 0.020
Benzo(b)fluoranthene					0.1	AL	0.041	< 0.020	-	-	0.3	0.093	<0.020	0.034	0.03	0.033	0.023	-	0.027	<0.020	<0.020	<0.020	<0.020	0.065	0.06	0.037
Benzo(g,h,i)perylene							<0.050	< 0.050	-	-	0.16	<0.050	<0.050	<0.050	<0.050	0.067	<0.050	-	<0.050	<0.050	<0.050	<0.050	<0.050	0.068	0.051	< 0.050
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	<0.020	< 0.020	-	-	0.15	0.036	<0.020	<0.020	<0.020	<0.020	<0.020	-	<0.020	<0.020	<0.020	<0.020	<0.020	< 0.020	< 0.020	< 0.020
Benzo[j]fluoranthene		EH					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**400**	HH	4500	HH	6.2	EI	0.021	< 0.020	-	-	0.31	0.048	<0.020	<0.020	<0.020	0.038	<0.020	-	0.031	<0.020	<0.020	<0.020	<0.020	0.089	0.094	0.035
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	<0.050	< 0.050	-	-	0.052	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.050	< 0.050	< 0.050
Fluoranthene	**50**	T	200	T	15.4	EI	<0.020	< 0.020	-	-	0.84	<0.020	<0.020	<0.020	<0.020	0.022	<0.020	-	<0.020	<0.020	<0.020	<0.020	<0.020	< 0.020	< 0.020	< 0.020
B[a]P TPE					5.3		0.044	0.041	-	-	0.47	0.12	0.041	0.043	0.043	0.044	0.042	-	0.043	0.041	0.041	0.041	0.041	0.048	0.047	0.044
Benzo(b+j)fluoranthene	**1**	EH	10	EH			0.041	< 0.020	-	-	0.47	0.13	<0.020	0.034	0.03	0.033	0.023	-	0.027	<0.020	<0.020	<0.020	<0.020	0.065	0.06	0.037
Fluorene	**1000**	HH	9500	HH	0.25	AW	<0.020	< 0.020	-	-	2	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	-	<0.020	<0.020	<0.020	<0.020	<0.020	< 0.020	< 0.020	< 0.020
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	<0.050	< 0.050	-	-	0.16	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.050	< 0.050	< 0.050
IACR					1.0		0.51	0.31	-	-	6.1	1.4	0.31	0.46	0.44	0.47	0.39	-	0.42	0.31	0.31	0.31	0.31	0.7	0.66	0.49
Naphthalene	**0.6**	T	20	T	0.013	AW	<0.010	< 0.010	-	-	0.41	0.25	<0.010	<0.010	<0.010	<0.010	<0.010	-	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	0.015	< 0.010
Phenanthrene	**5**	EH	50	EH	0.046	AW	0.029	< 0.010	-	-	0.63	0.016	<0.010	0.025	0.023	0.05	0.021	-	0.049	0.014	0.019	0.016	0.011	0.054	0.061	0.034
Pyrene	**10**	EH	100	HH	0.1	EI	<0.020	< 0.020	-	-	1.4	0.033	<0.020	<0.020	<0.020	0.035	<0.020	-	0.031	<0.020	<0.020	<0.020	<0.020	0.026	0.031	< 0.020
Quinoline	**4.5**	HH	10	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	**100**	HH	950	HH			<0.020	< 0.020	-	-	2.2	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	-	<0.020	<0.020	<0.020	<0.020	<0.020	0.023	0.033	< 0.020
1-Methylnaphthalene	**500**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Molecular Weight PAHs							<0.050	< 0.050	-	-	7	0.3	<0.050	<0.050	<0.050	0.05	<0.050	-	<0.050	<0.050	<0.050	<0.050	<0.050	0.089	0.11	< 0.050
High Molecular Weight PAHs							0.062	< 0.050	-	-	4.2	0.32	<0.050	<0.050	<0.050	0.2	<0.050	-	0.089	<0.050	<0.050	<0.050	<0.050	0.25	0.24	0.072
Total PAHs							0.091	< 0.050	-	-	11	0.62	<0.050	0.059	0.054	0.25	<0.050	-	0.14	<0.050	<0.050	<0.050	<0.050	0.34	0.34	0.11

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_{ss}(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-TP17-02	K19-TP17-02	K19-TP17-03	K19-TP17-03	K19-TP17-03	K19-TP17-04	K19-TP17-05	K19-TP17-06	K19-TP17-07	K19-TP17-08	K19-TP17-09	K19-TP17-10	K19-TP17-10	K19-TP17-10	K19-TP17-11	K19-TP17-12	K19-TP17-13	K19-TP17-13	K19-TP17-13	K19-TP17-14
Sample Control Number							03343-08	03343-10	03344-01	03344-02	03344-04	03344-06	03345-01	03345-10	03346-02	03346-05	03346-09	03346-12	03347-01	03347-05	03351-03	03351-08	03351-11	03351-12	03352-02	03352-08
Laboratory Report Number	BC CSR Standards for WL_R (< 3m) Stage 10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358
Date Sampled							22-Jan-17	22-Jan-17	22-Jan-17	22-Jan-17	22-Jan-17	23-Jan-17	23-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	25-Jan-17
Depth of Sample (m bgs)							1.8	2.5	1.8	2.5	**3.8**	2.5	2.6	**4.2**	**3.4**	2.5	2.5	0.5	0.5	**3.8**	2.5	2.4	0.6	1.6	**3.4**	**3.4**
QA/QC							FD											FDA	FD							
APEC																										
Field Parameters																										
Headspace by PID (ppm)							0.8	2.4	0.4	0.6	0.8	0.7	0	2.3	0.6	0.4	0.3	0.1	0.1	0.1	0	0.5	0.1	2.5	15.3	0.5
Physical Tests																										
% Moisture							12	11	16	17	9	16	13	6.7	11	10	12	19	20	10	13	16	18	15	15	10
Hydrocarbons																										
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	< 10	< 10	-	< 10	< 10	< 10	28	< 10	< 10	< 10	11	< 10	15	< 10	< 10	<10	-	< 10	< 10
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	< 10	< 10	-	< 10	< 10	< 10	29	< 10	< 10	< 10	14	12	15	< 10	< 10	<10	-	< 10	< 10
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			< 100	140	<100	< 100	< 100	< 100	< 100	110	< 100	< 100	< 100	-	-	< 100	< 100	< 100	-	650	380	< 100
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			< 100	110	<100	< 100	150	200	< 100	120	< 100	< 100	< 100	-	-	< 100	< 100	< 100	-	< 100	< 100	< 100
LEPH	**1000***	HH/EH	2000	HH/EH			< 100	140	<100	< 100	< 100	< 100	< 100	110	< 100	< 100	< 100	-	-	< 100	< 100	< 100	-	650	380	< 100
HEPH	**1000***	HH/EH	5000	HH/EH			< 100	110	<100	< 100	150	200	< 100	120	< 100	< 100	< 100	-	-	< 100	< 100	< 100	-	< 100	< 100	< 100
VPH	**200**	HH/EH	200	HH/EH			-	< 10	< 10	-	< 10	< 10	< 10	26	< 10	< 10	< 10	< 10	< 10	14	< 10	< 10	<10	-	< 10	< 10
VH(C6-C10)	**200***	HH/EH	200	HH/EH			-	< 10	< 10	-	< 10	< 10	< 10	26	< 10	< 10	< 10	11	10	14	< 10	< 10	<10	-	< 10	< 10
Polycyclic Aromatic Hydrocarbons (PAHs)																										
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	< 0.0050	< 0.0050	<0.0050	< 0.0050	0.0068	0.0055	< 0.0050	0.039	0.0097	< 0.0050	< 0.0050	-	-	0.017	< 0.0050	< 0.0050	-	0.0086	0.02	< 0.0050
Acenaphthylene					320	AW	< 0.0050	< 0.0050	<0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.0065	< 0.0050	< 0.0050	< 0.0050	-	-	< 0.0050	< 0.0050	< 0.0050	-	< 0.0050	0.0082	< 0.0050
Anthracene	**2.5**	T	30	T	2.5	SC	< 0.0040	< 0.0040	<0.0040	< 0.0040	< 0.0040	0.0076	< 0.0040	0.0042	0.013	< 0.0040	< 0.0040	-	-	< 0.0040	< 0.0040	< 0.0040	-	< 0.0040	< 0.0040	< 0.0040
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	< 0.020	< 0.020	<0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	-	-	< 0.020	< 0.020	< 0.020	-	< 0.020	< 0.020	< 0.020
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	< 0.020	< 0.020	<0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.035	< 0.020	< 0.020	< 0.020	-	-	< 0.020	< 0.020	< 0.020	-	< 0.020	< 0.020	< 0.020
Benzo(b)fluoranthene					0.1	AL	0.033	0.044	0.032	0.034	0.038	0.023	0.037	0.068	0.056	0.054	0.052	-	-	0.046	0.051	0.027	-	0.038	0.034	0.049
Benzo(g,h,i)perylene							< 0.050	0.052	<0.050	< 0.050	0.056	< 0.050	< 0.050	0.18	0.056	< 0.050	< 0.050	-	-	0.067	< 0.050	< 0.050	-	< 0.050	< 0.050	0.068
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	< 0.020	< 0.020	<0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	-	-	< 0.020	< 0.020	< 0.020	-	< 0.020	< 0.020	< 0.020
Benzo[j]fluoranthene		EH					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**400**	HH	4500	HH	6.2	EI	0.04	0.069	<0.020	0.038	0.068	0.037	0.032	0.15	0.11	0.084	0.09	-	-	0.088	0.083	0.024	-	0.038	0.042	0.11
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	< 0.050	< 0.050	<0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	-	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050
Fluoranthene	**50**	T	200	T	15.4	EI	< 0.020	< 0.020	<0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.053	0.049	< 0.020	0.02	-	-	0.03	0.021	< 0.020	-	< 0.020	< 0.020	0.042
B[a]P TPE					5.3		0.043	0.045	0.043	0.044	0.045	0.042	0.044	0.074	0.047	0.046	0.046	-	-	0.046	0.046	0.043	-	0.044	0.044	0.046
Benzo(b+j)fluoranthene	**1**	EH	10	EH			0.033	0.044	0.032	0.034	0.038	0.023	0.037	0.068	0.056	0.054	0.052	-	-	0.046	0.051	0.027	-	0.038	0.034	0.049
Fluorene	**1000**	HH	9500	HH	0.25	AW	< 0.020	< 0.020	<0.020	< 0.020	< 0.020	0.034	< 0.020	0.19	< 0.020	< 0.020	< 0.020	-	-	0.067	< 0.020	< 0.020	-	0.026	0.049	< 0.020
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	< 0.050	< 0.050	<0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	-	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050
IACR					1.0		0.47	0.55	0.45	0.47	0.52	0.4	0.49	0.83	0.65	0.62	0.61	-	-	0.58	0.6	0.42	-	0.5	0.47	0.61
Naphthalene	**0.6**	T	20	T	0.013	AW	< 0.010	0.02	<0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.31	0.037	0.012	0.018	-	-	0.12	0.018	< 0.010	-	0.03	0.054	0.027
Phenanthrene	**5**	EH	50	EH	0.046	AW	0.05	0.089	0.029	0.036	0.087	0.11	0.023	0.5	0.23	0.056	0.085	-	-	0.2	0.092	0.018	-	0.059	0.055	0.21
Pyrene	**10**	EH	100	HH	0.1	EI	< 0.020	0.023	<0.020	< 0.020	0.033	0.033	< 0.020	0.11	0.054	0.025	0.031	-	-	0.052	0.029	< 0.020	-	< 0.020	< 0.020	0.069
Quinoline	**4.5**	HH	10	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	**100**	HH	950	HH			0.021	0.053	<0.020	< 0.020	0.024	0.039	< 0.020	1	0.08	< 0.020	0.027	-	-	0.34	0.026	< 0.020	-	0.13	0.06	0.075
1-Methylnaphthalene	**500**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Molecular Weight PAHs							0.071	0.16	<0.050	< 0.050	0.12	0.19	< 0.050	2.1	0.37	0.068	0.13	-	-	0.75	0.14	< 0.050	-	0.25	0.25	0.31
High Molecular Weight PAHs							0.073	0.19	<0.050	0.072	0.2	0.093	0.069	0.59	0.32	0.16	0.19	-	-	0.28	0.18	0.05	-	0.077	0.076	0.34
Total PAHs							0.14	0.35	0.061	0.11	0.31	0.29	0.092	2.7	0.7	0.23	0.32	-	-	1	0.32	0.068	-	0.33	0.32	0.65

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_n(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-TP17-15	K19-TP17-15	K19-TP17-15	K19-TP17-16	K19-TP17-16	K19-TP17-16	K19-TP17-17	K19-TP17-18	K19-TP17-18	K19-TP17-18	K19-TP17-19	K19-TP17-19	K19-TP17-20	K19-TP17-20	K19-TP17-21	K19-TP17-21	K19-TP17-21	K19-TP17-21	K19-TP17-22	K19-TP17-22
Sample Control Number	BC CSR Standards for WL_R (< 3m) $Stage10_3$	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	03352-11	03353-01	03353-04	03347-07	03347-08	03347-11	03348-01	03349-01	03349-02	03350-07	03349-05	03349-07	03349-10	03350-01	03353-06	03353-07	03353-08	03353-11	03353-12	03354-04
Laboratory Report Number							B706358	B708210	B708210	B706358	B706358	B706358	B706358	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210
Date Sampled							25-Jan-17	25-Jan-17	25-Jan-17	25-Jan-17	25-Jan-17	25-Jan-17	25-Jan-17	25-Jan-17	25-Jan-17	25-Jan-17	25-Jan-17	25-Jan-17	26-Jan-17	26-Jan-17	25-Jan-17	25-Jan-17	25-Jan-17	25-Jan-17	26-Jan-17	26-Jan-17
Depth of Sample (m bgs)							1.6	**3.5**	**4.9**	1.5	1.5	**4.2**	1.5	**3.4**	**4**	2.5	2.6	**4**	2.5	**4.1**	1.5	2.4	2.4	**4.6**	0.5	2.9
QA/QC										FDA	FD											FDA	FD			
APEC																										
Field Parameters																										
Headspace by PID (ppm)							0.4	367	45.6	14.9	14.9	4.2	0.2	78.4	5.1	36.5	0.6	1	1.8	1	17	294.3	294.3	9.4	44.4	232.7
Physical Tests																										
% Moisture							17	11	8.8	13	15	7.8	18	9.8	8.1	12	15	8.8	16	9.3	17	11	12	9.6	20	11
Hydrocarbons																										
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	14	20	190	**350**	14	< 10	< 10	< 10	-	-	13	< 10	17	-	53	51	22	-	52
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	14	20	190	**350**	14	< 10	< 10	< 10	-	-	13	< 10	17	-	53	52	23	-	53
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			< 100	740	180	**4800**	**4600**	160	< 100	180	< 100	140	< 100	< 100	< 100	< 100	180	**1100**	**1100**	130	**4800**	**1900**
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			< 100	< 100	< 100	< 200	< 200	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	160	170	< 100	310	120
LEPH	**1000***	HH/EH	2000	HH/EH			< 100	740	180	**4800**	**4600**	160	< 100	180	< 100	140	< 100	< 100	< 100	< 100	180	**1100**	**1100**	130	**4800**	**1900**
HEPH	**1000***	HH/EH	5000	HH/EH			< 100	< 100	< 100	< 200	< 200	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	160	170	< 100	310	120
VPH	**200**	HH/EH	200	HH/EH			-	14	21	190	**340**	14	< 10	< 10	< 10	-	-	12	< 10	16	-	51	49	22	-	49
VH(C6-C10)	**200***	HH/EH	200	HH/EH			-	14	21	190	**340**	14	< 10	< 10	< 10	-	-	12	< 10	16	-	51	50	22	-	49
Polycyclic Aromatic Hydrocarbons (PAHs)																										
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	< 0.0050	0.068	0.024	0.45	0.28	0.033	< 0.0050	0.018	0.020	0.015	< 0.0050	0.018	< 0.0050	0.032	< 0.0050	0.12	0.13	0.029	0.27	0.18
Acenaphthylene					320	AW	< 0.0050	0.017	< 0.0050	0.1	0.071	0.0065	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.031	0.021	< 0.0050	< 0.0050	0.0091
Anthracene	**2.5**	T	30	T	2.5	SC	< 0.0040	0.0054	< 0.0040	0.038	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	0.052	0.045	0.005	0.014	0.021
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	< 0.020	< 0.020	0.021	< 0.020	< 0.020	0.028	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.021	< 0.020	0.025	< 0.020	< 0.020	< 0.020	0.024	< 0.020	< 0.020
Benzo(b)fluoranthene					0.1	AL	< 0.020	0.053	0.051	0.029	0.032	0.063	0.047	0.041	0.04	0.041	0.048	0.044	0.047	0.046	< 0.020	0.043	0.05	0.052	< 0.020	0.048
Benzo(g,h,i)perylene							< 0.050	0.079	0.12	< 0.050	< 0.050	0.14	< 0.050	0.073	0.092	< 0.050	< 0.050	0.1	< 0.050	0.15	< 0.050	< 0.050	< 0.050	0.13	< 0.050	0.068
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Benzo[j]fluoranthene		EH					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**400**	HH	4500	HH	6.2	EI	< 0.020	0.034	0.034	0.035	0.032	0.13	0.031	0.041	0.028	< 0.020	0.026	0.077	0.021	0.029	< 0.020	0.024	0.028	0.035	< 0.020	0.047
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Fluoranthene	**50**	T	200	T	15.4	EI	< 0.020	0.045	0.039	< 0.020	< 0.020	0.05	< 0.020	0.03	0.034	< 0.020	< 0.020	0.036	0.024	0.032	< 0.020	0.049	0.057	0.043	< 0.020	0.04
B[a]P TPE					5.3		0.041	0.046	0.057	0.043	0.043	0.067	0.045	0.045	0.045	0.044	0.045	0.057	0.045	0.06	0.041	0.044	0.045	0.06	0.041	0.045
Benzo(b+j)fluoranthene	**1**	EH	10	EH			< 0.020	0.053	0.051	0.029	0.032	0.063	0.047	0.041	0.04	0.041	0.048	0.044	0.047	0.046	< 0.020	0.043	0.05	0.052	< 0.020	0.048
Fluorene	**1000**	HH	9500	HH	0.25	AW	< 0.020	0.13	0.1	0.59	0.47	0.11	< 0.020	0.057	0.11	0.063	< 0.020	0.09	< 0.020	0.13	< 0.020	0.46	0.5	0.16	0.077	0.99
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
IACR					1.0		0.31	0.59	0.62	0.44	0.46	0.76	0.55	0.53	0.51	0.5	0.55	0.6	0.55	0.6	0.31	0.52	0.57	0.64	0.31	0.57
Naphthalene	**0.6**	T	20	T	0.013	AW	< 0.010	0.11	0.25	**3**	**2.1**	0.3	< 0.010	0.032	0.26	0.031	0.011	0.11	0.029	0.21	< 0.010	0.4	0.47	0.43	0.044	**2.1**
Phenanthrene	**5**	EH	50	EH	0.046	AW	< 0.010	0.31	0.3	0.51	0.47	0.39	0.012	0.19	0.27	0.067	0.041	0.24	0.11	0.29	0.031	1.2	1.2	0.39	0.063	0.97
Pyrene	**10**	EH	100	HH	0.1	EI	< 0.020	0.062	0.065	0.022	0.022	0.084	< 0.020	0.053	0.059	< 0.020	0.029	0.053	0.038	0.063	0.024	0.075	0.084	0.075	0.021	0.053
Quinoline	**4.5**	HH	10	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	**100**	HH	950	HH			< 0.020	0.28	0.58	0.59	0.38	0.58	< 0.020	0.13	0.59	0.049	< 0.020	0.4	0.041	0.62	0.028	0.29	0.35	0.89	0.19	6.1
1-Methylnaphthalene	**500**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Molecular Weight PAHs							< 0.050	0.93	1.3	5.3	3.7	1.4	< 0.050	0.43	1.3	0.22	0.053	0.86	0.18	1.3	0.059	2.7	3	1.9	0.65	10
High Molecular Weight PAHs							< 0.050	0.27	0.33	0.087	0.085	0.49	0.078	0.24	0.25	< 0.050	0.1	0.33	0.13	0.34	< 0.050	0.19	0.22	0.36	< 0.050	0.26
Total PAHs							< 0.050	1.2	1.6	5.4	3.8	1.9	0.09	0.66	1.5	0.27	0.16	1.2	0.31	1.6	0.083	2.9	3.2	2.3	0.67	11

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_n(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location								K19-TP17-22	K19-TP17-23	K19-TP17-23	K19-TP17-24	K19-TP17-24	K19-TP17-25	K19-TP17-26	K19-TP17-26	K19-TP17-26	K19-TP17-27	K19-TP17-27	K19-TP17-28	K19-TP17-28	K19-TP17-29	K19-TP17-29	K19-TP17-29	K19-TP17-29	K19-TP17-30	K19-TP17-30	K19-TP17-30
Sample Control Number	BC CSR Standards for WL_R (< 3m) $Stage10_3$	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes		03354-06	03354-09	03354-11	03355-05	03355-07	03355-10	03350-03	03350-08	03350-11	03356-03	03356-04	03356-09	03356-11	03357-01	03357-02	03357-04	03357-07	03357-09	03357-12	03358-01
Laboratory Report Number								B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210
Date Sampled								26-Jan-17	26-Jan-17	26-Jan-17	26-Jan-17	26-Jan-17	26-Jan-17	26-Jan-17	26-Jan-17	26-Jan-17	26-Jan-17	26-Jan-17	27-Jan-17	27-Jan-17	27-Jan-17	27-Jan-17	27-Jan-17	27-Jan-17	27-Jan-17	27-Jan-17	27-Jan-17
Depth of Sample (m bgs)								**5.1**	2.1	**3.2**	2.5	**4**	2.5	1.5	**4.4**	**6.2**	**3.5**	**4.6**	2.6	**4.3**	1.5 FDA	1.5 FD	**3.5**	**5.8**	1.5	**3.2**	**4.6**
QA/QC																											
APEC																											
Field Parameters																											
Headspace by PID (ppm)								82.7	0	240.2	222.8	0.2	0	0.2	615.1	106.4	6.2	10.2	1	8.7	0.6	0.6	415.4	8.1	0.8	164.2	3.8
Physical Tests																											
% Moisture								7.8	20	10	11	7.9	15	7.0	9.8	9.7	9.1	6.2	5.2	6.0	16	16	12	10	16	12	9.8
Hydrocarbons																											
F1 - BTEX	**200***	HH/EH	200	HH/EH	30			20	-	30	< 10	-	< 10	< 10	530	51	< 10	< 10	< 10	< 10	< 10	-	67	66	< 10	10	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30			20	-	31	< 10	-	< 10	< 10	580	57	< 10	< 10	< 10	< 10	< 10	-	68	67	< 10	10	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH				750	< 100	1300	260	< 100	< 100	< 100	360	250	190	280	130	320	< 100	< 100	1900	100	< 100	510	< 100
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH				110	< 100	100	< 100	< 100	170	< 100	200	210	320	330	280	380	< 100	< 100	< 100	< 100	< 100	< 100	< 100
LEPH	**1000***	HH/EH	2000	HH/EH				750	< 100	1300	260	< 100	< 100	< 100	360	250	190	280	130	320	< 100	< 100	1900	100	< 100	510	< 100
HEPH	**1000***	HH/EH	5000	HH/EH				110	< 100	100	< 100	< 100	170	< 100	200	210	320	330	280	380	< 100	< 100	< 100	< 100	< 100	< 100	< 100
VPH	**200**	HH/EH	200	HH/EH				18	-	26	< 10	-	< 10	< 10	500	48	< 10	< 10	< 10	< 10	< 10	-	61	50	< 10	10	-
VH(C6-C10)	**200***	HH/EH	200	HH/EH				19	-	27	< 10	-	< 10	< 10	550	54	< 10	< 10	< 10	< 10	< 10	-	61	51	< 10	10	-
Polycyclic Aromatic Hydrocarbons (PAHs)																											
Acenaphthene	**2000**	HH	15000	HH	0.28		AW	0.099	< 0.0050	0.068	0.048	0.029	0.0091	< 0.0050	0.010	0.016	0.010	0.018	0.0071	0.034	< 0.0050	< 0.0050	0.10	0.024	< 0.0050	0.031	0.027
Acenaphthylene					320		AW	0.013	< 0.0050	0.011	0.008	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Anthracene	**2.5**	T	30	T	2.5		SC	0.0056	< 0.0040	0.0076	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	0.0043	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040
Benz(a)anthrancene	**1**	EH	10	EH	0.1		AL	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Benzo(a)pyrene	**10**	I	50	I	0.6		EI	0.025	< 0.020	< 0.020	< 0.020	0.028	0.025	< 0.020	< 0.020	0.02	< 0.020	< 0.020	< 0.020	0.02	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.033
Benzo(b)fluoranthene					0.1		AL	0.056	0.024	0.045	0.041	0.056	0.057	0.022	0.064	0.049	0.045	0.054	0.043	0.058	0.034	0.027	0.053	0.043	0.029	0.044	0.058
Benzo(g,h,i)perylene								0.15	< 0.050	0.073	< 0.050	0.15	0.11	< 0.050	0.093	0.099	0.09	0.13	0.082	0.14	< 0.050	< 0.050	0.061	0.093	< 0.050	< 0.050	0.19
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1		AL	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Benzo[j]fluoranthene		EH						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**400**	HH	4500	HH	6.2		EI	0.037	< 0.020	0.038	0.027	0.037	0.028	< 0.020	0.056	0.042	0.035	0.052	0.035	0.056	< 0.020	< 0.020	0.1	0.073	< 0.020	0.077	0.043
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1		AL	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Fluoranthene	**50**	T	200	T	15.4		EI	0.039	< 0.020	0.04	0.021	0.039	0.03	< 0.020	0.032	0.032	< 0.020	0.031	< 0.020	0.034	< 0.020	< 0.020	0.031	0.031	< 0.020	< 0.020	0.044
B[a]P TPE					5.3			0.062	0.042	0.045	0.044	0.065	0.062	0.042	0.047	0.056	0.045	0.047	0.045	0.057	0.043	0.043	0.046	0.045	0.043	0.045	0.07
Benzo(b+j)fluoranthene	**1**	EH	10	EH				0.056	0.024	0.045	0.041	0.056	0.057	0.022	0.064	0.049	0.045	0.054	0.043	0.058	0.034	0.027	0.053	0.043	0.029	0.044	0.058
Fluorene	**1000**	HH	9500	HH	0.25		AW	0.37	< 0.020	0.25	0.11	0.14	< 0.020	< 0.020	< 0.020	0.052	< 0.020	0.027	< 0.020	0.035	< 0.020	< 0.020	0.28	0.11	< 0.020	0.046	0.1
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1		AL	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
IACR					1.0			0.67	0.39	0.55	0.51	0.68	0.66	0.38	0.68	0.61	0.55	0.62	0.53	0.68	0.46	0.42	0.62	0.56	0.43	0.55	0.71
Naphthalene	**0.6**	T	20	T	0.013		AW	**1.5**	< 0.010	0.78	0.08	0.22	0.018	< 0.010	1.2	0.24	< 0.010	0.012	< 0.010	0.017	< 0.010	< 0.010	0.22	0.4	< 0.010	0.043	0.069
Phenanthrene	**5**	EH	50	EH	0.046		AW	0.53	0.019	0.39	0.13	0.33	0.078	0.027	0.11	0.17	0.055	0.14	0.077	0.21	0.028	0.017	0.37	0.24	0.018	0.13	0.29
Pyrene	**10**	EH	100	HH	0.1		EI	0.067	< 0.020	0.056	< 0.020	0.073	0.075	< 0.020	0.08	0.068	0.049	0.071	0.041	0.078	< 0.020	< 0.020	0.038	0.046	< 0.020	0.025	0.086
Quinoline	**4.5**	HH	10	HH				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	**100**	HH	950	HH				3	< 0.020	2.7	0.29	0.66	0.055	< 0.020	0.41	0.13	< 0.020	0.031	< 0.020	0.054	< 0.020	< 0.020	0.33	0.71	< 0.020	0.082	0.26
1-Methylnaphthalene	**500**	HH	1000	HH				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Molecular Weight PAHs								5.6	< 0.050	4.2	0.66	1.4	0.16	< 0.050	1.7	0.6	0.065	0.23	0.084	0.36	< 0.050	< 0.050	1.3	1.5	< 0.050	0.33	0.75
High Molecular Weight PAHs								0.37	< 0.050	0.25	0.089	0.38	0.32	< 0.050	0.33	0.31	0.22	0.33	0.2	0.38	< 0.050	< 0.050	0.28	0.29	< 0.050	0.15	0.45
Total PAHs								5.9	< 0.050	4.5	0.75	1.8	0.49	< 0.050	2	0.91	0.28	0.57	0.29	0.74	0.062	< 0.050	1.6	1.8	< 0.050	0.48	1.2

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_w(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30 Exceeds CSR WLR (<3m) standard
30 Exceeds CSR IL (>3m) standard
23 Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-TP17-31	K19-TP17-32	K19-TP17-32	K19-TP17-33	K19-TP17-34	K19-TP17-35	K19-TP17-36	K19-TP17-36	K19-TP17-37	K19-TP17-38	K19-TP17-39	K19-TP17-39	K19-TP17-39	K19-TP17-39	K19-TP17-40	K19-TP17-41	K19-TP17-42	K19-TP17-43	K19-TP17-44	K19-TP17-44
Sample Control Number							03361-04	03361-08	03361-11	03362-03	03362-07	03363-03	03358-05	03358-07	03359-01	03359-06	03364-11	03364-12	03365-03	03365-04	03365-06	03363-10	03364-04	03364-06	03359-10	03359-11
Laboratory Report Number							B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210
Date Sampled							27-Jan-17	27-Jan-17	27-Jan-17	27-Jan-17	27-Jan-17	28-Jan-17	28-Jan-17	28-Jan-17	28-Jan-17	28-Jan-17	29-Jan-17	29-Jan-17	29-Jan-17	29-Jan-17	29-Jan-17	28-Jan-17	28-Jan-17	28-Jan-17	29-Jan-17	29-Jan-17
Depth of Sample (m bgs)							2.5	1.4	**3.5**	2.4	1.5	**3.4**	2.4	**4.1**	**4**	**3.5**	1.5 FDA	1.5 FD	**4**	**5.1**	1.5	**4.3**	**4.3**	1.4	**3.4**	**4.2**
QA/QC																										
APEC																										
Field Parameters																										
Headspace by PID (ppm)							0.1	0.8	0.7	3.5	1.2	1.2	1.6	2	1.3	0.8	14.4	14.4	65.4	4.4	2	1.8	1	1.3	1.3	1.2
Physical Tests																										
% Moisture							14	15	9.6	12	14	9.4	11	10	13	10	17	16	8.7	8.7	13	10	12	15	13	13
Hydrocarbons																										
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		< 10	< 10	-	< 10	< 10	< 10	< 10	13	14	< 10	< 10	< 10	25	41	< 10	21	< 10	< 10	-	< 10
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		< 10	< 10	-	< 10	< 10	< 10	< 10	13	14	< 10	< 10	< 10	25	42	< 10	21	< 10	< 10	-	< 10
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	340	160	< 100	< 100	< 100	< 100	< 100	< 100	-
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	140	-
LEPH	**1000***	HH/EH	2000	HH/EH			< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	340	160	< 100	< 100	< 100	< 100	< 100	< 100	-
HEPH	**1000***	HH/EH	5000	HH/EH			< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	140	-
VPH	**200**	HH/EH	200	HH/EH			< 10	< 10	-	< 10	< 10	< 10	< 10	13	13	< 10	< 10	< 10	21	38	< 10	20	< 10	< 10	-	< 10
VH(C6-C10)	**200***	HH/EH	200	HH/EH			< 10	< 10	-	< 10	< 10	< 10	< 10	13	13	< 10	< 10	< 10	22	39	< 10	21	< 10	< 10	-	< 10
Polycyclic Aromatic Hydrocarbons (PAHs)																										
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.0054	0.021	0.031	0.0065	< 0.0050	0.021	0.045	0.036	< 0.0050	0.024	0.016	< 0.0050	0.0094	-
Acenaphthylene					320	AW	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	-
Anthracene	**2.5**	T	30	T	2.5	SC	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	-
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	-
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.028	< 0.020	< 0.020	< 0.020	0.03	0.032	< 0.020	0.023	0.028	< 0.020	0.022	-
Benzo(b)fluoranthene					0.1	AL	0.04	0.026	0.043	0.035	0.022	0.06	0.044	0.051	0.05	0.05	0.021	0.021	0.055	0.049	0.033	0.054	0.05	0.057	0.053	-
Benzo(g,h,i)perylene							< 0.050	< 0.050	0.081	< 0.050	< 0.050	0.092	< 0.050	0.11	0.16	0.095	< 0.050	< 0.050	0.17	0.17	< 0.050	0.14	0.13	0.088	0.13	-
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	-
Benzo[j]fluoranthene		EH					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**400**	HH	4500	HH	6.2	EI	< 0.020	< 0.020	0.034	< 0.020	< 0.020	0.049	0.029	0.039	0.043	0.038	< 0.020	< 0.020	0.042	0.034	< 0.020	0.043	0.035	0.028	0.053	-
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-
Fluoranthene	**50**	T	200	T	15.4	EI	< 0.020	< 0.020	0.039	< 0.020	< 0.020	0.035	< 0.020	0.037	0.042	0.022	< 0.020	< 0.020	0.044	0.042	< 0.020	0.034	0.039	< 0.020	0.04	-
B[a]P TPE					5.3		0.044	0.042	0.045	0.043	0.042	0.047	0.044	0.046	0.065	0.046	0.042	0.042	0.067	0.068	0.043	0.06	0.065	0.046	0.059	-
Benzo(b+j)fluoranthene	**1**	EH	10	EH			0.04	0.026	0.043	0.035	0.022	0.06	0.044	0.051	0.05	0.05	0.021	0.021	0.055	0.049	0.033	0.054	0.05	0.057	0.053	-
Fluorene	**1000**	HH	9500	HH	0.25	AW	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.087	0.14	< 0.020	< 0.020	0.02	0.11	0.17	< 0.020	0.11	0.032	< 0.020	< 0.020	-
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-
IACR					1.0		0.5	0.41	0.53	0.46	0.38	0.65	0.53	0.59	0.65	0.58	0.37	0.38	0.68	0.64	0.45	0.65	0.64	0.62	0.65	-
Naphthalene	**0.6**	T	20	T	0.013	AW	0.013	< 0.010	0.046	0.012	< 0.010	0.038	< 0.010	0.35	0.27	0.015	0.021	0.12	0.24	0.43	< 0.010	0.22	0.027	0.015	0.018	-
Phenanthrene	**5**	EH	50	EH	0.046	AW	0.045	< 0.010	0.31	0.027	0.011	0.22	0.047	0.32	0.36	0.085	0.018	0.025	0.37	0.38	0.029	0.28	0.13	0.059	0.094	-
Pyrene	**10**	EH	100	HH	0.1	EI	< 0.020	< 0.020	0.057	< 0.020	< 0.020	0.049	< 0.020	0.065	0.082	0.056	< 0.020	< 0.020	0.083	0.083	< 0.020	0.069	0.082	0.022	0.08	-
Quinoline	**4.5**	HH	10	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	**100**	HH	950	HH			< 0.020	< 0.020	0.11	0.032	< 0.020	0.065	< 0.020	0.77	0.71	0.044	< 0.020	0.17	0.63	0.97	< 0.020	0.65	0.08	0.022	0.054	-
1-Methylnaphthalene	**500**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Molecular Weight PAHs							0.059	< 0.050	0.47	0.072	< 0.050	0.33	0.052	1.5	1.5	0.15	< 0.050	0.35	1.4	2	< 0.050	1.3	0.28	0.097	0.18	-
High Molecular Weight PAHs							< 0.050	< 0.050	0.25	< 0.050	< 0.050	0.29	0.073	0.3	0.41	0.26	< 0.050	< 0.050	0.42	0.41	< 0.050	0.37	0.37	0.2	0.37	-
Total PAHs							0.099	< 0.050	0.72	0.11	< 0.050	0.61	0.13	1.8	1.9	0.41	0.059	0.38	1.8	2.4	0.062	1.7	0.65	0.29	0.55	-

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_{n}(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location								K19-TP17-44	K19-TP17-44	K19-TP17-45	K19-TP17-46	K19-TP17-47	K19-TP17-48	K19-TP17-48	K19-TP17-49	K19-TP17-49	K19-TP17-50	K19-TP17-50	K19-MW17-01	K19-MW17-01	K19-MW17-01	K19-MW17-01	K19-MW17-01	K19-MW17-02	K19-MW17-02	K19-MW17-02	K19-BH17-03
Sample Control Number								03365-11	03365-12	06685-04	06685-11	06686-02	06686-06	06686-12	06688-03	06688-06	06688-09	06688-12	03360-02	03360-04	03360-05	03360-08	03360-10	03360-12	06696-01	06696-05	06696-11
Laboratory Report Number								B708210	B708210	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132
Date Sampled								29-Jan-17	29-Jan-17	30-Jan-17	30-Jan-17	30-Jan-17	30-Jan-17	30-Jan-17	31-Jan-17	31-Jan-17	31-Jan-17	31-Jan-17	30-Jan-17	30-Jan-17	30-Jan-17	30-Jan-17	30-Jan-17	30-Jan-17	30-Jan-17	30-Jan-17	31-Jan-17
Depth of Sample (m bgs)								1.7	1.7	2.5	**3.4**	1.6	0.7	**4.9**	2.4	**4.1**	2.4	**5.1**	1.5	**3.5**	**3.5**	**6.5**	**8.6**	1.5	2.5	**5.5**	**3.5**
QA/QC								FDA	FD																		
APEC																											
Field Parameters																											
Headspace by PID (ppm)								1.5	1.5	1.2	1.3	1	5.4	3.8	35.5	4.4	5.9	6.8	64.6	448.1	448.1	86.2	7.5	33.3	1.7	16.7	8.5
Physical Tests																											
% Moisture								12	12	16	8.8	13	16	7.9	16	8.2	7.7	5.3	12	7.2	5.6	5.4	13	7.9	6.9	5	7.7
Hydrocarbons																											
F1 - BTEX	**200***	HH/EH	200	HH/EH	30			< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	18	< 10	12	31	250	360	32	22	< 10	< 10	17	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30			< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	18	< 10	16	32	260	380	33	23	< 10	< 10	18	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH				< 100	< 100	< 100	< 100	< 100	< 100	190	430	140	< 100	250	< 100	320	340	< 100	< 100	< 100	390	290	< 100
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH				< 100	< 100	< 100	< 100	< 100	< 100	310	< 100	< 100	140	340	< 100	120	140	< 100	< 100	< 100	< 100	490	< 100
LEPH	**1000***	HH/EH	2000	HH/EH				< 100	< 100	< 100	< 100	< 100	< 100	190	430	140	< 100	250	< 100	320	340	< 100	< 100	< 100	390	290	< 100
HEPH	**1000***	HH/EH	5000	HH/EH				< 100	< 100	< 100	< 100	< 100	< 100	310	< 100	< 100	140	340	< 100	120	140	< 100	< 100	< 100	< 100	490	< 100
VPH	**200**	HH/EH	200	HH/EH				< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	17	< 10	< 10	32	410	340	26	20	< 10	< 10	13	-
VH(C6-C10)	**200***	HH/EH	200	HH/EH				< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	18	< 10	13	33	420	350	26	21	< 10	< 10	14	-
Polycyclic Aromatic Hydrocarbons (PAHs)																											
Acenaphthene	**2000**	HH	15000	HH	0.28	AW		< 0.0050	< 0.0050	0.0077	0.019	< 0.0050	< 0.0050	0.029	0.059	0.040	0.017	0.031	< 0.0050	0.023	0.028	0.050	0.033	0.0078	0.048	0.031	0.025
Acenaphthylene					320	AW		< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Anthracene	**2.5**	T	30	T	2.5	SC		< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL		< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Benzo(a)pyrene	**10**	I	50	I	0.6	EI		< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.02	< 0.020	0.022	< 0.020	0.021	< 0.020	< 0.020	< 0.020	0.024	0.022	< 0.020	< 0.020	0.023	0.03
Benzo(b)fluoranthene					0.1	AL		0.024	0.022	0.047	0.038	0.033	< 0.020	0.051	0.023	0.044	0.033	0.057	0.021	0.032	0.035	0.049	0.036	0.021	0.022	0.049	0.061
Benzo(g,h,i)perylene								< 0.050	< 0.050	< 0.050	0.069	< 0.050	< 0.050	0.11	< 0.050	0.098	0.054	0.13	< 0.050	< 0.050	< 0.050	0.11	0.094	< 0.050	< 0.050	0.12	0.16
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL		< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Benzo[j]fluoranthene		EH						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**400**	HH	4500	HH	6.2	EI		< 0.020	< 0.020	0.028	0.026	< 0.020	< 0.020	0.069	< 0.020	0.031	0.021	0.047	< 0.020	0.021	0.021	0.056	0.039	< 0.020	< 0.020	0.042	0.043
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL		< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Fluoranthene	**50**	T	200	T	15.4	EI		< 0.020	< 0.020	< 0.020	0.032	< 0.020	< 0.020	0.025	< 0.020	0.039	< 0.020	0.031	< 0.020	< 0.020	< 0.020	0.032	0.032	< 0.020	< 0.020	0.024	0.048
B[a]P TPE					5.3			0.042	0.042	0.045	0.044	0.043	0.041	0.056	0.042	0.057	0.044	0.058	0.042	0.043	0.043	0.061	0.056	0.042	0.042	0.059	0.068
Benzo(b+j)fluoranthene	**1**	EH	10	EH				0.024	0.022	0.047	0.038	0.033	< 0.020	0.051	0.023	0.044	0.033	0.057	0.021	0.032	0.035	0.049	0.036	0.021	0.022	0.049	0.061
Fluorene	**1000**	HH	9500	HH	0.25	AW		< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.18	0.15	< 0.020	0.023	< 0.020	0.03	0.036	0.17	0.15	< 0.020	0.2	0.028	0.11
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL		< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
IACR					1.0			0.4	0.38	0.55	0.5	0.45	0.31	0.63	0.39	0.57	0.46	0.67	0.38	0.45	0.47	0.63	0.53	0.38	0.39	0.62	0.72
Naphthalene	**0.6**	T	20	T	0.013	AW		< 0.010	< 0.010	< 0.010	0.019	< 0.010	0.015	< 0.010	0.029	0.49	< 0.010	0.012	< 0.010	1.3	1.3	0.33	0.49	0.012	0.13	0.021	0.53
Phenanthrene	**5**	EH	50	EH	0.046	AW		0.028	0.026	0.066	0.21	0.027	< 0.010	0.11	0.16	0.33	0.049	0.16	0.036	0.095	0.11	0.38	0.35	0.044	0.16	0.16	0.37
Pyrene	**10**	EH	100	HH	0.1	EI		< 0.020	< 0.020	0.021	0.052	< 0.020	< 0.020	0.058	< 0.020	0.058	0.023	0.072	< 0.020	< 0.020	< 0.020	0.066	0.053	< 0.020	< 0.020	0.062	0.072
Quinoline	**4.5**	HH	10	HH				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	**100**	HH	950	HH				< 0.020	< 0.020	0.024	0.12	< 0.020	0.042	0.03	0.14	0.91	0.026	0.038	< 0.020	0.76	0.79	0.98	0.98	0.023	0.17	0.052	0.94
1-Methylnaphthalene	**500**	HH	1000	HH				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Molecular Weight PAHs								< 0.050	< 0.050	0.098	0.37	< 0.050	0.057	0.17	0.56	1.9	0.092	0.27	< 0.050	2.2	2.3	1.9	2	0.088	0.72	0.3	2
High Molecular Weight PAHs								< 0.050	< 0.050	0.096	0.22	< 0.050	< 0.050	0.33	< 0.050	0.29	0.13	0.35	< 0.050	0.053	0.056	0.34	0.28	< 0.050	< 0.050	0.32	0.42
Total PAHs								0.052	< 0.050	0.19	0.59	0.059	0.057	0.5	0.59	2.2	0.22	0.62	0.057	2.2	2.3	2.3	2.3	0.11	0.74	0.62	2.4

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_w(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-BH17-03	K19-MW17-04	K19-MW17-04	K19-MW17-05	K19-MW17-05	K19-MW17-05	K19-MW17-05	K19-MW17-06	K19-MW17-06	K19-MW17-06	K19-MW17-06	K19-MW17-07	K19-MW17-07	K19-MW17-07	K19-BH17-08	K19-BH17-08	K19-BH17-09	K19-BH17-09	K19-BH17-09	K19-MW17-10
Sample Control Number							06696-12	06697-03	06697-06	06697-11	06697-12	06698-01	06698-02	06698-09	06698-10	06698-11	06698-12	06699-08	06699-10	06699-12	06700-07	06700-10	06701-01	06701-02	06701-04	06701-08
Laboratory Report Number							B709132	B709132	B709132	B709132	B709132	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078
Date Sampled							31-Jan-17	31-Jan-17	1-Feb-17	1-Feb-17	1-Feb-17	1-Feb-17	1-Feb-17	2-Feb-17	2-Feb-17	2-Feb-17	2-Feb-17	3-Feb-17	3-Feb-17	3-Feb-17	4-Feb-17	4-Feb-17	4-Feb-17	4-Feb-17	4-Feb-17	4-Feb-17
Depth of Sample (m bgs)							**4.4**	1.4	**3.3**	1.4	2.5	**3.5**	**4.7**	2.5	**3.5** FDA	**3.5** FD	**4.7**	1.5	2.5	**4.7**	2.5	**5.2**	2.5 FDA	2.5 FD	**4.3**	2.5
QA/QC																										
APEC																										
Field Parameters																										
Headspace by PID (ppm)							3.2	100.3	4.9	1.9	392.5	16.8	14.2	1.3	2.6	2.6	12.2	0.6	318.5	15.2	1	7.9	15.7	15.7	10	1.6
Physical Tests																										
% Moisture							7.1	16	7.7	16	8	5.2	4.6	8.3	4.7	5	5.7	17	12	4.3	13	4.8	9.7	10	6.1	6.8
Hydrocarbons																										
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		53	52	30	< 10	13	40	-	< 10	22	25	-	< 10	28	44	< 10	53	16	17	-	11
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		55	52	30	< 10	14	40	-	< 10	22	25	-	< 10	28	46	< 10	55	16	17	-	11
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			-	**1200**	< 100	< 100	720	-	< 100	< 100	< 100	< 100	< 100	< 100	450	< 100	< 100	< 100	290	240	< 100	< 100
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			-	< 100	110	< 100	< 100	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	100	< 100	< 100
LEPH	**1000***	HH/EH	2000	HH/EH			-	**1200**	< 100	< 100	710	-	< 100	< 100	< 100	< 100	< 100	< 100	450	< 100	< 100	< 100	290	240	< 100	< 100
HEPH	**1000***	HH/EH	5000	HH/EH			-	< 100	110	< 100	< 100	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	100	< 100	< 100
VPH	**200**	HH/EH	200	HH/EH			44	50	27	< 10	13	38	-	< 10	21	24	-	< 10	27	41	< 10	49	15	14	-	10
VH(C6-C10)	**200***	HH/EH	200	HH/EH			46	50	27	< 10	13	39	-	< 10	21	24	-	< 10	28	43	< 10	51	15	14	-	10
Polycyclic Aromatic Hydrocarbons (PAHs)																										
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	-	0.078	0.040	< 0.0050	0.094	-	0.038	0.0058	0.033	0.028	0.035	0.0057	0.049	0.038	< 0.0050	0.041	0.056	0.037	0.04	0.012
Acenaphthylene					320	AW	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.0065	< 0.0050	< 0.0050
Anthracene	**2.5**	T	30	T	2.5	SC	-	< 0.0040	< 0.0040	< 0.0040	< 0.0040	-	0.016	< 0.0040	0.016	0.0097	0.011	< 0.0040	0.0059	0.013	< 0.0040	0.018	0.0096	0.0067	0.015	0.0076
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	-	< 0.020	0.021	< 0.020	< 0.020	-	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.02	0.021	< 0.020	
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	-	< 0.020	0.048	< 0.020	< 0.020	-	0.031	< 0.020	0.029	0.027	0.029	< 0.020	< 0.020	0.033	< 0.020	0.033	0.022	0.023	0.037	0.02
Benzo(b)fluoranthene					0.1	AL	-	0.031	0.067	0.031	0.071	-	0.045	0.054	0.047	0.047	0.048	0.044	0.048	0.05	0.046	0.052	0.072	0.083	0.057	0.072
Benzo(g,h,i)perylene							-	< 0.050	0.24	< 0.050	0.088	-	0.12	0.058	0.13	0.12	0.14	0.07	0.065	0.15	< 0.050	0.15	0.14	0.17	0.17	0.12
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	-	< 0.020	< 0.020	< 0.020	< 0.020	-	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Benzo[j]fluoranthene		EH					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**400**	HH	4500	HH	6.2	EI	-	< 0.020	0.047	< 0.020	0.042	-	0.055	0.054	0.035	0.038	0.042	0.021	0.04	0.038	0.06	0.032	0.057	0.085	0.041	0.064
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	-	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Fluoranthene	**50**	T	200	T	15.4	EI	-	< 0.020	0.055	< 0.020	0.044	-	0.051	0.031	0.047	0.047	0.048	< 0.020	0.034	0.054	< 0.020	0.054	0.063	0.065	0.057	0.064
B[a]P TPE					5.3		-	0.043	0.088	0.043	0.048	-	0.067	0.046	0.065	0.063	0.065	0.045	0.045	0.07	0.045	0.07	0.061	0.065	0.076	0.059
Benzo(b+j)fluoranthene	**1**	EH	10	EH			-	0.031	0.067	0.031	0.071	-	0.045	0.054	0.047	0.047	0.048	0.044	0.048	0.05	0.046	0.052	0.072	0.083	0.057	0.072
Fluorene	**1000**	HH	9500	HH	0.25	AW	-	0.046	0.16	< 0.020	0.14	-	0.18	< 0.020	0.16	0.14	0.16	< 0.020	0.17	0.2	< 0.020	0.2	0.11	0.11	0.2	< 0.020
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	-	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
IACR					1.0		-	0.44	0.85	0.44	0.71	-	0.62	0.61	0.62	0.61	0.63	0.53	0.56	0.65	0.56	0.67	0.77	0.89	0.75	0.76
Naphthalene	**0.6**	T	20	T	0.013	AW	-	0.028	0.18	< 0.010	0.071	-	0.85	0.02	0.52	0.39	0.51	< 0.010	0.52	0.91	< 0.010	0.93	0.15	0.38	0.59	0.046
Phenanthrene	**5**	EH	50	EH	0.046	AW	-	0.094	0.39	0.021	0.27	-	0.47	0.12	0.42	0.39	0.42	0.057	0.21	0.46	0.033	0.47	0.39	0.43	0.48	0.37
Pyrene	**10**	EH	100	HH	0.1	EI	-	< 0.020	0.098	< 0.020	0.06	-	0.085	0.035	0.078	0.076	0.08	0.02	0.036	0.087	< 0.020	0.088	0.081	0.078	0.093	0.09
Quinoline	**4.5**	HH	10	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	**100**	HH	950	HH			-	0.1	0.68	< 0.020	0.2	-	1.4	0.022	1.1	0.96	1.1	0.021	0.3	1.4	< 0.020	1.4	0.52	0.85	1.2	0.11
1-Methylnaphthalene	**500**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Molecular Weight PAHs							-	0.35	1.5	< 0.050	0.78	-	2.9	0.17	2.3	1.9	2.2	0.084	1.3	3	< 0.050	3.1	1.2	1.8	2.5	0.55
High Molecular Weight PAHs							-	< 0.050	0.58	< 0.050	0.31	-	0.39	0.23	0.37	0.35	0.39	0.16	0.22	0.41	0.11	0.41	0.44	0.52	0.48	0.43
Total PAHs							-	0.38	2	0.052	1.1	-	3.3	0.4	2.6	2.3	2.6	0.24	1.5	3.4	0.14	3.5	1.7	2.3	3	0.98

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_n(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-MW17-10	K19-MW17-11	K19-MW17-11	K19-MW17-12	K19-MW17-12	K19-MW17-13	K19-MW17-13	K19-BH17-14	K19-BH17-14	K19-BH17-14	K19-BH17-14	K19-BH17-15	K19-BH17-15	K19-BH17-16	K19-BH17-16	K19-BH17-16	K19-HA17-01	K19-HA17-06	K19-HA17-06
Sample Control Number							06701-10	06702-05	06702-07	06702-10	06703-01	06703-10	06703-12	06704-06	06704-07	06704-08	06704-09	06705-03	06705-04	06705-09	06705-10	06705-11	03811-04	03845-01	03845-03
Laboratory Report Number	BC CSR Standards for WL_R (< 3m) $Stage10_3$	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710365	B710365	B710365	B710365	B710365	B710365	B710365	B710365	B710365	17N240971	17N243343	17N243343
Date Sampled							4-Feb-17	5-Feb-17	5-Feb-17	5-Feb-17	5-Feb-17	6-Feb-17	6-Feb-17	7-Feb-17	7-Feb-17	7-Feb-17	7-Feb-17	7-Feb-17	7-Feb-17	7-Feb-17	7-Feb-17	7-Feb-17	7/17/2017	23-Jul-17	23-Jul-17
Depth of Sample (m bgs)							**4.7**	**3.5**	**5.5**	1.4	**3.5**	**3.5**	**5.5**	2.5	2.5	**3.5**	**4.3**	**3.5**	**4.3**	**3.5**	**4.2**	**4.2**	0.4-0.6	0.5-0.6	1.4-1.5
QA/QC														FDA	FD						FDA	FD			
APEC																							1a	10a	10a
Field Parameters																									
Headspace by PID (ppm)							6.8	1.7	21.8	2.4	16.9	3.6	8.2	2.9	2.9	58.5	64.9	9.1	14.2	5.7	2.7	2.7	0.1	0.5	0.9
Physical Tests																									
% Moisture							4.7	5.8	6	15	6	6.8	4.3	6.9	6.9	5	4.2	6.5	4.9	7.9	7.6	7.7	-	-	-
Hydrocarbons																									
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	< 10	-	< 10	46	32	50	< 10	< 10	12	-	30	-	24	-	-	-	-	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	< 10	-	< 10	46	32	52	< 10	< 10	12	-	30	-	25	-	-	-	-	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			< 100	< 100	110	< 100	< 100	< 100	< 100	< 100	< 100	-	210	-	< 100	< 100	110	< 100	-	< 20	24
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			< 100	< 100	120	< 100	110	< 100	< 100	< 100	< 100	-	440	-	< 100	110	110	< 100	-	30	64
LEPH	**1000***	HH/EH	2000	HH/EH			< 100	< 100	110	< 100	< 100	< 100	< 100	< 100	< 100	-	210	-	< 100	< 100	110	< 100	-	< 20	24
HEPH	**1000***	HH/EH	5000	HH/EH			< 100	< 100	110	< 100	110	< 100	< 100	< 100	< 100	-	440	-	< 100	110	110	< 100	-	30	63
VPH	**200**	HH/EH	200	HH/EH			-	< 10	-	< 10	44	29	46	< 10	< 10	11	-	28	-	25	-	-	< 10	-	< 10
VH(C6-C10)	**200***	HH/EH	200	HH/EH			-	< 10	-	< 10	44	29	48	< 10	< 10	11	-	29	-	25	-	-	< 10	-	< 10
Polycyclic Aromatic Hydrocarbons (PAHs)																									
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	0.035	0.011	0.059	< 0.0050	0.048	0.032	0.038	0.0076	0.0076	-	0.029	-	0.036	0.041	0.047	0.033	-	< 0.005	< 0.005
Acenaphthylene					320	AW	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	-	< 0.0050	-	< 0.0050	< 0.0050	0.0062	0.0062	-	< 0.005	< 0.005
Anthracene	**2.5**	T	30	T	2.5	SC	0.01	0.0043	0.018	< 0.0040	0.0057	0.007	0.011	< 0.0040	< 0.0040	-	< 0.0040	-	0.013	0.0045	< 0.0040	< 0.0040	-	< 0.004	< 0.004
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	< 0.020	< 0.020	< 0.020	< 0.020	0.021	0.021	< 0.020	< 0.020	< 0.020	-	< 0.020	-	< 0.020	0.024	0.023	0.021	-	< 0.03	< 0.03
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	0.028	0.02	0.038	< 0.020	0.042	0.039	0.031	< 0.020	< 0.020	-	< 0.020	-	0.031	0.046	0.041	0.043	-	< 0.03	< 0.03
Benzo(b)fluoranthene					0.1	AL	0.049	0.04	0.062	< 0.020	0.059	0.061	0.045	0.025	0.031	-	0.051	-	0.05	0.068	0.075	0.075	-	< 0.05	0.07
Benzo(g,h,i)perylene							0.13	0.1	0.17	< 0.050	0.21	0.2	0.14	< 0.050	< 0.050	-	0.11	-	0.14	0.24	0.23	0.23	-	< 0.05	0.13
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	-	< 0.020	-	< 0.020	< 0.020	< 0.020	< 0.020	-	< 0.05	< 0.05
Benzo[j]fluoranthene		EH					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.05	< 0.05
Chrysene	**400**	HH	4500	HH	6.2	EI	0.029	0.032	0.051	< 0.020	0.062	0.073	0.031	< 0.020	0.021	-	0.044	-	0.029	0.082	0.054	0.051	-	< 0.05	0.11
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	-	0.005	0.018
Fluoranthene	**50**	T	200	T	15.4	EI	0.044	0.038	0.062	< 0.020	0.057	0.059	0.05	< 0.020	< 0.020	-	0.023	-	0.051	0.066	0.068	0.065	-	< 0.01	0.03
B[a]P TPE					5.3		0.064	0.055	0.075	0.041	0.081	0.078	0.067	0.042	0.043	-	0.046	-	0.067	0.087	0.082	0.084	-	< 0.05	< 0.05
Benzo(b+j)fluoranthene	**1**	EH	10	EH			0.049	0.04	0.062	< 0.020	0.059	0.061	0.045	0.025	0.031	-	0.051	-	0.05	0.068	0.075	0.075	-	< 0.05	0.07
Fluorene	**1000**	HH	9500	HH	0.25	AW	0.17	0.02	0.24	< 0.020	0.19	0.19	0.2	< 0.020	< 0.020	-	< 0.020	-	0.18	0.21	0.24	0.22	-	< 0.02	< 0.02
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.02	< 0.02
IACR					1.0		0.63	0.55	0.75	0.31	0.79	0.79	0.61	0.4	0.44	-	0.59	-	0.64	0.87	0.89	0.89	-	< 0.6	0.9
Naphthalene	**0.6**	T	20	T	0.013	AW	0.74	0.017	1	< 0.010	0.69	0.51	1	< 0.010	0.011	-	0.014	-	0.85	0.57	0.84	0.73	-	< 0.005	< 0.005
Phenanthrene	**5**	EH	50	EH	0.046	AW	0.4	0.15	0.61	0.014	0.47	0.45	0.46	0.045	0.065	-	0.13	-	0.43	0.49	0.54	0.5	-	< 0.02	0.06
Pyrene	**10**	EH	100	HH	0.1	EI	0.075	0.083	0.11	< 0.020	0.09	0.089	0.083	< 0.020	< 0.020	-	0.058	-	0.084	0.11	0.12	0.11	-	< 0.01	0.02
Quinoline	**4.5**	HH	10	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.05	< 0.05
2-Methylnaphthalene	**100**	HH	950	HH			1.2	0.071	1.9	< 0.020	1.4	1.2	1.5	< 0.020	0.03	-	0.044	-	1.3	1.3	1.6	1.5	-	< 0.005	0.018
1-Methylnaphthalene	**500**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.006	0.027
Low Molecular Weight PAHs							2.6	0.28	3.8	< 0.050	2.8	2.4	3.3	0.053	0.11	-	0.22	-	2.8	2.6	3.3	3	-	-	-
High Molecular Weight PAHs							0.36	0.32	0.5	< 0.050	0.54	0.54	0.38	< 0.050	0.052	-	0.29	-	0.38	0.63	0.62	0.6	-	-	-
Total PAHs							2.9	0.6	4.3	< 0.050	3.4	2.9	3.6	0.078	0.17	-	0.5	-	3.2	3.2	3.9	3.6	-	-	-

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_n(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-HA17-07	K19-HA17-08	K19-HA17-08	K19-HA17-09	K19-HA17-10	K19-HD17-01	K19-HD17-02	K19-HD17-03	K19-HD17-04	K19-HD17-07	K19-MW17-17	K19-MW17-17	K19-MW17-17	K19-MW17-18	K19-MW17-18	K19-MW17-18	K19-MW17-18
Sample Control Number							03606-01	03606-02	03606-03	04263-01	04263-04	03776-01	03776-02	03776-03	03776-04	03776-07	03831-04	03831-05	03831-06	03831-09	03831-10	03831-12	03832-02
Laboratory Report Number							17N244304	17N244304	17N244304	17N271535	17N271535	17N238668	17N238668	17N238668	17N238668	17N238668	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971
Date Sampled							29-Jul-17	30-Jul-17	30-Jul-17	11-Oct-17	11-Oct-17	16-Jul-17	16-Jul-17	16-Jul-17	16-Jul-17	16-Jul-17	18-Jul-17	18-Jul-17	18-Jul-17	19-Jul-17	19-Jul-17	19-Jul-17	19-Jul-17
Depth of Sample (m bgs)							0.35-0.5	0.3-0.45	0.7-1.1	0.05 - 0.45	1 - 1.5	0.4	0.4	0.35	0.4	0.3	4.3-4.5 m	5.2-5.8 m	6.5-7 m	1.5-1.8	**4.5-4.8**	**5.2-5.5**	**7.5-8.5**
QA/QC																							
APEC							background	10a	10a	9	9	1d	1d	1d	1d	6	26	26	26	24	24	24	24
Field Parameters																							
Headspace by PID (ppm)							0.8	1	0.7	0	0	0.2	0.4	0.6	0.1	0.2	0	329.1	71.3	18.1	33.1	44	144.4
Physical Tests																							
% Moisture							-	-	-	-	-	-	-	-	-	-				-	-	-	-
Hydrocarbons																							
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			< 20	33	< 20	56	25	< 20	101	34	460	-	43	365	292	157	101	100	398
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			22	129	44	381	77	120	289	283	684	-	76	438	417	24	100	100	470
LEPH	**1000***	HH/EH	2000	HH/EH			< 20	33	< 20	56	25	< 20	101	34	460	-	43	365	292	156	100	98	398
HEPH	**1000***	HH/EH	5000	HH/EH			21	128	44	381	77	120	289	282	684	-	76	438	417	24	100	100	470
VPH	**200**	HH/EH	200	HH/EH			< 10	< 10	-	<10	-	-	< 10	< 10	-	< 10	-	28	-	-	38	-	21
VH(C6-C10)	**200***	HH/EH	200	HH/EH			< 10	< 10	-	<10	-	-	< 10	< 10	-	< 10	-	28	-	-	38	-	21
Polycyclic Aromatic Hydrocarbons (PAHs)																							
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.01	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.05	< 0.005
Acenaphthylene					320	AW	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.009	< 0.005	< 0.01	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.05	< 0.005
Anthracene	**2.5**	T	30	T	2.5	SC	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	0.006	< 0.004	< 0.02	-	< 0.004	< 0.004	< 0.004	< 0.004	< 0.04	< 0.04	< 0.004
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.02	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.05	-	< 0.03	< 0.03	< 0.03	< 0.03	0.03	0.03	< 0.03
Benzo(b)fluoranthene					0.1	AL	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	-	0.05	< 0.05	< 0.05	< 0.05	0.05	0.05	< 0.05
Benzo(g,h,i)perylene							0.05	< 0.05	0.08	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	0.09	0.09	0.09	< 0.05	0.16	0.15	0.09
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo[j]fluoranthene		EH					< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	**400**	HH	4500	HH	6.2	EI	< 0.05	< 0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	0.08	0.1	0.1	< 0.05	0.12	0.11	0.1
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	0.011	0.005	0.009	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.02	-	0.007	< 0.005	< 0.005	< 0.005	0.006	0.005	< 0.005
Fluoranthene	**50**	T	200	T	15.4	EI	< 0.01	0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	-	0.03	0.02	0.02	< 0.01	0.04	0.04	0.02
B[a]P TPE					5.3		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	0.05	0.05	< 0.05
Benzo(b+j)fluoranthene	**1**	EH	10	EH			0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	0.05	< 0.05	< 0.05	< 0.05	0.05	0.05	< 0.05
Fluorene	**1000**	HH	9500	HH	0.25	AW	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	-	< 0.02	0.03	0.03	< 0.02	< 0.2	< 0.2	0.05
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.02	< 0.02	< 0.02	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
IACR					1.0		0.7	< 0.6	0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	-	0.8	0.6	0.6	< 0.6	0.8	0.8	0.6
Naphthalene	**0.6**	T	20	T	0.013	AW	0.009	0.039	0.017	< 0.005	< 0.005	< 0.005	0.005	0.005	< 0.01	-	0.01	< 0.005	0.029	0.124	1.09	1.25	0.028
Phenanthrene	**5**	EH	50	EH	0.046	AW	0.03	0.04	0.06	< 0.02	< 0.02	< 0.02	< 0.02	0.02	0.04	-	0.08	0.29	0.19	0.03	0.5	0.5	0.25
Pyrene	**10**	EH	100	HH	0.1	EI	< 0.01	0.01	0.02	< 0.01	< 0.01	< 0.01	0.01	< 0.01	0.05	-	0.07	0.05	0.05	< 0.01	0.08	0.07	0.05
Quinoline	**4.5**	HH	10	HH			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.5	< 0.5	< 0.05
2-Methylnaphthalene	**100**	HH	950	HH			0.011	0.154	0.041	< 0.005	< 0.005	< 0.005	0.018	0.02	< 0.01	-	0.042	0.095	0.119	0.685	2.15	2.21	0.095
1-Methylnaphthalene	**500**	HH	1000	HH			0.01	0.068	0.043	< 0.005	< 0.005	< 0.005	0.011	0.013	< 0.01	-	0.046	0.078	0.092	0.478	1.47	1.52	0.08
Low Molecular Weight PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
High Molecular Weight PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

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CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

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Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_w(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

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23	Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-MW17-18	K19-MW17-19	K19-MW17-19	K19-MW17-19	K19-MW17-20	K19-MW17-20	K19-MW17-20	K19-MW17-21	K19-MW17-21	K19-MW17-22	K19-MW17-22	K19-MW17-22	K19-MW17-22	K19-MW17-22	K19-MW17-23	K19-MW17-23	K19-MW17-23
Sample Control Number							03832-04	03832-06	03832-08	03832-11	03833-03	03833-05	03833-06	03833-10	03834-02	03834-05	03834-06	03834-07	03834-09	03834-10	03835-01	03835-02	03835-04
Laboratory Report Number	**BC CSR Standards for WL_R(< 3m) Stage10_3**	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	17N240971	17N240971	17N240971	17N240971	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036
Date Sampled							19-Jul-17	19-Jul-17	19-Jul-17	19-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17
Depth of Sample (m bgs)							**12-13**	1.8-2.1 m	**5-6 m**	**7-8 m**	**3-3.5**	**5.8-6.8**	**5.8-6.8**	**4.5-5**	**9-10**	**3-3.5**	**4.5-5**	**4.5-5**	**8-8.5**	**9-10**	**3-3.3**	**4.5-5**	**8-8.5**
QA/QC												FDA	FD				FDA	FD					
APEC							24	27	27	27	6	6	6	21	21	25	25	25	25	25	18	18	18
Field Parameters																							
Headspace by PID (ppm)							26.5				1.6	22.8	22.8	11.5	16.4	12.1	14.6	14.6	46.6	55.6	19.2	24.2	16.5
Physical Tests																							
% Moisture							-				-	-	-	-	-	-	-	-	-	-	-	-	-
Hydrocarbons																							
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			262	119	74	64	57	124	81	68	106	75	75	77	125	143	74	94	68
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			349	156	100	68	76	121	72	68	95	81	73	76	118	126	78	91	65
LEPH	**1000***	HH/EH	2000	HH/EH			262	119	74	62	57	122	80	66	105	74	73	75	122	141	73	92	66
HEPH	**1000***	HH/EH	5000	HH/EH			349	156	100	68	76	121	72	68	95	81	73	76	118	125	78	91	64
VPH	**200**	HH/EH	200	HH/EH			22	-	50	57	< 10	32	59	32	56	-	38	-	-	82	38	-	29
VH(C6-C10)	**200***	HH/EH	200	HH/EH			22	-	50	59	< 10	33	60	33	58	-	40	-	-	83	38	-	31
Polycyclic Aromatic Hydrocarbons (PAHs)																							
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene					320	AW	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	**2.5**	T	30	T	2.5	SC	< 0.004	0.109	< 0.004	< 0.04	< 0.004	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	< 0.03	< 0.03	< 0.03	0.03	< 0.03	0.03	< 0.03	< 0.03	0.03	< 0.03	< 0.03	0.03	0.03	0.03	0.04	0.03	< 0.03
Benzo(b)fluoranthene					0.1	AL	0.05	0.05	0.05	0.05	0.07	0.06	< 0.05	< 0.05	0.05	< 0.05	< 0.05	0.05	0.05	0.06	0.05	0.05	< 0.05
Benzo(g,h,i)perylene							0.1	0.07	0.12	0.12	0.11	0.15	0.13	0.09	0.13	0.11	0.1	0.17	0.13	0.14	0.15	0.15	0.09
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo[j]fluoranthene		EH					< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	**400**	HH	4500	HH	6.2	EI	0.11	0.08	0.11	0.11	0.15	0.13	0.08	0.07	0.12	0.09	0.08	0.08	0.12	0.15	0.11	0.11	0.07
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	< 0.005	< 0.005	< 0.005	< 0.005	0.006	0.006	< 0.005	< 0.005	0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.005	0.005	< 0.005	< 0.005
Fluoranthene	**50**	T	200	T	15.4	EI	0.02	0.01	0.03	0.03	0.05	0.04	0.03	0.03	0.04	0.03	0.03	0.04	0.04	0.04	0.04	0.05	0.03
B[a]P TPE					5.3		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	< 0.05	< 0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	0.06	< 0.05	< 0.05
Benzo(b+j)fluoranthene	**1**	EH	10	EH			0.05	0.05	0.05	0.05	0.07	0.06	< 0.05	< 0.05	0.05	< 0.05	< 0.05	0.05	0.05	0.06	0.05	0.05	< 0.05
Fluorene	**1000**	HH	9500	HH	0.25	AW	0.1	< 0.02	0.16	< 0.2	< 0.02	0.2	< 0.2	< 0.2	0.2	< 0.2	< 0.2	< 0.2	0.2	0.2	< 0.2	0.2	< 0.2
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
IACR					1.0		0.7	0.7	0.8	0.8	0.9	0.9	0.6	0.6	0.8	0.6	0.6	0.8	0.8	0.9	0.8	0.8	0.6
Naphthalene	**0.6**	T	20	T	0.013	AW	0.062	0.047	0.169	1.34	0.049	1.54	0.94	0.99	1.28	0.71	1.28	1.08	2.2	0.66	0.75	1.46	0.92
Phenanthrene	**5**	EH	50	EH	0.046	AW	0.39	0.11	0.41	0.5	0.4	0.5	0.4	0.3	0.5	0.3	0.4	0.4	0.5	0.9	0.4	0.5	0.3
Pyrene	**10**	EH	100	HH	0.1	EI	0.05	0.04	0.06	0.07	0.06	0.08	0.06	0.05	0.08	0.06	0.06	0.07	0.08	0.09	0.08	0.08	0.05
Quinoline	**4.5**	HH	10	HH			< 0.05	< 0.05	< 0.05	< 0.5	< 0.05	< 0.5	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
2-Methylnaphthalene	**100**	HH	950	HH			0.402	0.094	0.870	2.40	0.181	2.74	1.72	1.58	2.43	1.41	1.93	1.62	3.03	2.51	1.55	2.29	1.38
1-Methylnaphthalene	**500**	HH	1000	HH			0.27	0.089	0.541	1.59	0.148	1.88	1.2	1.1	1.65	0.97	1.34	1.15	2.11	1.63	1.12	1.67	0.96
Low Molecular Weight PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
High Molecular Weight PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_n(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.
Italics = indicates that the detection limit exceeds one or more criteria.
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-MW17-24	K19-MW17-24	K19-MW17-25	K19-MW17-25	K19-MW17-25	K19-MW17-26	K19-MW17-26	K19-MW17-26	K19-MW17-26	K19-MW17-26	K19-MW17-27	K19-MW17-27	K19-MW17-27	K19-MW17-28	K19-MW17-28	K19-MW17-29	K19-MW17-29
Sample Control Number	BC CSR Standards for WL_R(< 3m) Stage10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	03835-10	03835-12	03836-03	03836-04	03836-05	03836-08	03836-09	03836-10	03836-12	03837-01	03837-05	03837-06	03837-08	03838-01	03838-03	03838-06	03838-07
Laboratory Report Number							17N242036	17N242036	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343
Date Sampled							22-Jul-17	22-Jul-17	22-Jul-17	22-Jul-17	22-Jul-17	22-Jul-17	22-Jul-17	22-Jul-17	22-Jul-17	22-Jul-17	23-Jul-17	23-Jul-17	23-Jul-17	23-Jul-17	23-Jul-17	24-Jul-17	24-Jul-17
Depth of Sample (m bgs)							**3-3.5**	**4.7-5.2**	**3-3.5**	**4.5-5**	**6-6.5**	**3.5-4**	**3.5-4**	**5-5.5**	**8-8.8**	**11-11.8**	**4.5-5**	**6-6.5**	**8-8.75**	**5-5.5**	**8-8.5**	2.5-2.8	**3.4-3.7**
QA/QC												FDA	FD										FDA
APEC							17	17	16	16	16	19	19	19	19	19	20	20	20	4	4	1b	1b
Field Parameters																							
Headspace by PID (ppm)							7.1	5	1.3	5.2	4.3	6.8	6.8	18.3	21.8	18	11.5	10	15.8	8	10.1	415.2	436.3
Physical Tests																							
% Moisture							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydrocarbons																							
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			87	79	-	48	-	83	80	69	46	110	62	-	114	216	245	857	484
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			91	76	-	56	-	82	80	70	40	88	55	-	106	353	427	119	85
LEPH	**1000***	HH/EH	2000	HH/EH			86	78	-	47	-	82	79	68	44	108	60	-	112	216	244	857	483
HEPH	**1000***	HH/EH	5000	HH/EH			90	76	-	56	-	81	80	70	40	87	55	-	106	353	427	118	84
VPH	**200**	HH/EH	200	HH/EH			-	37	< 10	-	26	20	19	-	45	64	-	15	52	< 10	< 10	< 10	30
VH(C6-C10)	**200***	HH/EH	200	HH/EH			-	38	< 10	-	26	20	19	-	50	69	-	15	53	< 10	< 10	< 10	31
Polycyclic Aromatic Hydrocarbons (PAHs)																							
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	< 0.05	< 0.005	-	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.005	< 0.005	< 0.005	< 0.005
Acenaphthylene					320	AW	< 0.05	< 0.005	-	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.005	< 0.005	< 0.005	< 0.005
Anthracene	**2.5**	T	30	T	2.5	SC	< 0.04	< 0.004	-	< 0.004	-	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	-	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	< 0.03	< 0.03	-	< 0.03	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	0.04	0.03	-	< 0.03	-	0.03	0.04	0.03	< 0.03	0.03	0.03	-	0.04	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene					0.1	AL	0.06	0.05	-	< 0.05	-	0.05	0.05	0.05	< 0.05	0.06	0.05	-	0.07	< 0.05	0.05	< 0.05	< 0.05
Benzo(g,h,i)perylene							0.19	0.2	-	0.16	-	0.26	0.29	0.21	0.13	0.25	0.2	-	0.3	0.12	0.16	< 0.05	< 0.05
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo[j]fluoranthene		EH					< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	**400**	HH	4500	HH	6.2	EI	0.12	0.11	-	0.08	-	0.11	0.12	0.1	0.08	0.15	0.12	-	0.18	0.08	0.13	< 0.05	< 0.05
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	0.006	< 0.005	-	0.006	-	0.009	0.01	0.009	0.006	< 0.005	0.01	-	0.011	0.007	0.006	0.005	0.006
Fluoranthene	**50**	T	200	T	15.4	EI	0.05	0.05	-	0.03	-	0.05	0.06	0.04	0.03	0.04	0.05	-	0.07	0.02	0.02	< 0.01	< 0.01
B[a]P TPE					5.3		0.06	< 0.05	-	< 0.05	-	0.05	0.06	0.05	< 0.05	0.05	0.05	-	0.07	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b+j)fluoranthene	**1**	EH	10	EH			0.06	0.05	-	< 0.05	-	0.05	0.05	0.05	< 0.05	0.06	0.05	-	0.07	< 0.05	0.05	< 0.05	< 0.05
Fluorene	**1000**	HH	9500	HH	0.25	AW	< 0.2	0.19	-	0.07	-	0.16	0.18	0.16	0.14	0.27	0.22	-	0.3	< 0.02	< 0.02	0.13	0.08
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	< 0.02	< 0.02	-	< 0.02	-	< 0.02	0.02	< 0.02	< 0.02	< 0.02	< 0.02	-	0.02	< 0.02	< 0.02	< 0.02	< 0.02
IACR					1.0		0.9	0.8	-	0.6	-	0.8	0.9	0.8	0.6	0.9	0.8	-	1.0	0.6	0.8	< 0.6	0.6
Naphthalene	**0.6**	T	20	T	0.013	AW	0.46	0.841	-	0.19	-	0.59	0.52	0.71	1	1.39	0.98	-	1.32	0.014	0.044	0.306	0.746
Phenanthrene	**5**	EH	50	EH	0.046	AW	0.4	0.51	-	0.33	-	0.47	0.52	0.44	0.38	0.7	0.54	-	0.8	0.2	0.17	0.2	0.16
Pyrene	**10**	EH	100	HH	0.1	EI	0.09	0.09	-	0.06	-	0.09	0.1	0.07	0.05	0.09	0.08	-	0.13	0.05	0.06	0.01	< 0.01
Quinoline	**4.5**	HH	10	HH			< 0.5	< 0.05	-	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	**100**	HH	950	HH			1.17	1.56	-	0.59	-	1.3	1.24	1.26	1.38	2.59	1.69	-	2.6	< 0.005	< 0.005	< 0.005	0.34
1-Methylnaphthalene	**500**	HH	1000	HH			0.81	1.13	-	0.4	-	0.934	0.87	0.9	0.98	1.77	1.18	-	1.78	0.052	0.088	0.593	0.935
Low Molecular Weight PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
High Molecular Weight PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_w(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30 Exceeds CSR WLR (<3m) standard
30 Exceeds CSR IL (>3m) standard
23 Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.
Italics = indicates that the detection limit exceeds one or more criteria.
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-MW17-29	K19-MW17-29	K19-MW17-30	K19-MW17-30	K19-MW17-31	K19-MW17-31	K19-MW17-31	K19-MW17-31	K19-MW17-32	K19-MW17-32	K19-MW17-32	K19-MW17-33	K19-MW17-34	K19-MW17-34	K19-MW17-34	K19-MW17-35	K19-MW17-35
Sample Control Number	**BC CSR Standards for WL_R(< 3m) Stage10_3**	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	03838-08	03838-10	03839-01	03839-04	03839-05	03839-07	03839-09	03839-10	03839-11	03846-01	03846-02	03846-06	03846-09	03846-10	03846-12	03847-02	03847-03
Laboratory Report Number							17N243343	17N243343	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826
Date Sampled							24-Jul-17	24-Jul-17	25-Jul-17	25-Jul-17	26-Jul-17	26-Jul-17	26-Jul-17	26-Jul-17	26-Jul-17	26-Jul-17	26-Jul-17	26-Jul-17	27-Jul-17	27-Jul-17	27-Jul-17	27-Jul-17	27-Jul-17
Depth of Sample (m bgs)							**3.4-3.7**	**5.3-5.5**	**3.5-3.9**	**8-8.7**	0.3-0.5	**3.5-4**	**6.4-6.8**	**6.4-6.8**	0.3-0.5	**3.5-4**	**5-5.5**	**5-5.5**	**3.5-4**	**3.5-4**	**6-6.5**	1-1.5	1-1.5
QA/QC							FD						FDA	FD					FDA	FD		FDA	FD
APEC							1b	1b	12	12	11	11	11	11	1d	1d	1d	14	15	15	15	1b	1b
Field Parameters																							
Headspace by PID (ppm)							436.3	20.1	6.9	8.7	0.8	6.4	14.8	14.8	0.4	125	9.1	9.9	4.2	4.2	14.2	25.8	25.8
Physical Tests																							
% Moisture							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydrocarbons																							
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			573	57	98	80	< 20	66	80	84	< 20	221	82	120	61	64	120	374	308
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			89	54	122	78	25	80	81	85	98	347	97	130	82	81	120	400	318
LEPH	**1000***	HH/EH	2000	HH/EH			572	56	97	77	< 20	65	79	82	< 20	221	81	119	60	63	118	372	307
HEPH	**1000***	HH/EH	5000	HH/EH			89	53	121	77	25	80	81	85	98	347	97	130	82	80	120	400	318
VPH	**200**	HH/EH	200	HH/EH			46	< 10	27	35	-	17	31	27	-	< 10	20	24	12	11	21	19	17
VH(C6-C10)	**200***	HH/EH	200	HH/EH			47	< 10	28	38	-	17	32	28	-	< 10	20	24	12	11	22	20	17
Polycyclic Aromatic Hydrocarbons (PAHs)																							
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	< 0.05	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Acenaphthylene					320	AW	< 0.05	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Anthracene	**2.5**	T	30	T	2.5	SC	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	< 0.03	0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	< 0.03	0.05	0.04	0.04	< 0.03	0.03	0.03	0.04	< 0.03	< 0.03	0.03	0.04	0.03	0.03	0.04	< 0.03	< 0.03
Benzo(b)fluoranthene					0.1	AL	< 0.05	0.36	0.07	0.07	< 0.05	0.05	0.06	0.06	0.06	0.07	0.06	0.08	0.07	0.09	0.07	< 0.05	< 0.05
Benzo(g,h,i)perylene							< 0.05	0.53	0.27	0.26	< 0.05	0.18	0.23	0.25	0.08	0.15	0.15	0.23	0.18	0.18	0.21	< 0.05	< 0.05
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo[j]fluoranthene		EH					< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	**400**	HH	4500	HH	6.2	EI	< 0.05	0.7	0.14	0.12	< 0.05	0.09	0.11	0.12	0.08	0.14	0.11	0.16	0.12	0.12	0.15	< 0.05	< 0.05
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	0.006	0.076	< 0.005	0.007	0.011	0.006	0.006	0.006	0.017	0.005	0.006	0.011	0.01	0.011	0.007	< 0.005	< 0.005
Fluoranthene	**50**	T	200	T	15.4	EI	< 0.01	0.1	0.05	0.06	< 0.01	0.04	0.05	0.06	< 0.01	0.03	0.03	0.06	0.05	0.05	0.05	0.01	0.01
B[a]P TPE					5.3		< 0.05	0.18	0.06	0.06	< 0.05	0.05	0.05	0.06	< 0.05	< 0.05	0.05	0.07	0.05	0.06	0.06	< 0.05	< 0.05
Benzo(b+j)fluoranthene	**1**	EH	10	EH			< 0.05	0.36	0.07	0.07	< 0.05	0.05	0.06	0.06	0.06	0.07	0.06	0.08	0.07	0.09	0.07	< 0.05	< 0.05
Fluorene	**1000**	HH	9500	HH	0.25	AW	0.12	0.04	0.17	0.23	< 0.02	0.13	0.21	0.23	< 0.02	0.03	0.2	0.08	0.03	0.03	0.2	0.13	0.1
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	< 0.02	0.07	0.02	0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
IACR					1.0		0.6	3.5	1.0	1.0	0.6	0.8	0.9	0.9	0.9	0.9	0.9	1.1	1	1.1	1	< 0.6	< 0.6
Naphthalene	**0.6**	T	20	T	0.013	AW	0.96	0.256	0.304	1.77	0.008	0.228	1.22	1.53	0.011	0.029	0.428	0.123	0.121	0.151	0.94	**1.17**	**1.01**
Phenanthrene	**5**	EH	50	EH	0.046	AW	0.18	0.61	0.52	0.61	0.02	0.36	0.55	0.6	0.07	0.19	0.51	0.67	0.47	0.5	0.62	0.19	0.13
Pyrene	**10**	EH	100	HH	0.1	EI	< 0.01	0.2	0.09	0.1	0.01	0.06	0.1	0.1	0.02	0.07	0.07	0.11	0.09	0.08	0.11	0.01	0.01
Quinoline	**4.5**	HH	10	HH			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	**100**	HH	950	HH			0.51	0.375	1.3	2.64	0.01	0.764	2.17	2.47	0.028	0.086	1.47	1	0.544	0.657	1.73	3.76	3.29
1-Methylnaphthalene	**500**	HH	1000	HH			1.18	0.555	0.93	1.93	0.009	0.528	1.53	1.78	0.031	0.074	0.95	0.57	0.401	0.468	1.21	1.71	1.44
Low Molecular Weight PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
High Molecular Weight PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_w(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30 Exceeds CSR WLR (<3m) standard
30 Exceeds CSR IL (>3m) standard
23 Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.
Italics = indicates that the detection limit exceeds one or more criteria.
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-MW17-35	K19-MW17-35	K19-MW17-35	K19-MW17-35	K19-TP17-52	K19-TP17-52	K19-TP17-52	K19-TP17-52	K19-TP17-53	K19-TP17-53	K19-TP17-54	K19-TP17-54	K19-TP17-55	K19-TP17-55	K19-TP17-55	K19-TP17-55	K19-TP17-56
Sample Control Number							03847-05	03847-07	03847-08	03847-10	03796-06	03796-07	03796-09	03796-10	03796-11	03796-12	03820-03	03820-07	03820-08	03820-09	03820-10	03820-11	03821-02
Laboratory Report Number							17N243826	17N243826	17N243826	17N243826	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668
Date Sampled							27-Jul-17	27-Jul-17	27-Jul-17	27-Jul-17	14-Jul-17	14-Jul-17	14-Jul-17	14-Jul-17	14-Jul-17	14-Jul-17	14-Jul-17	14-Jul-17	14-Jul-17	14-Jul-17	14-Jul-17	14-Jul-17	15-Jul-17
Depth of Sample (m bgs)							2.5-3	**4-4.5**	**4-4.5**	**6.5-7**	0.8	0.8	2.9	**4.0**	0.8	1.9	0.7	**4.1**	0.5	1.8	**3.0**	**4.0**	1.5
QA/QC								FDA	FD		FDA	FD											
APEC	BC CSR Standards for WL_R(< 3m) $Stage10_3$	Notes	BC CSR Standards for IL (> 3m) $Stage\ 10_3$	Notes	CCME Guidelines for RL/PL & AL	Notes	1b	1b	1b	1b	1e	1e	1e	1e	1e	1e	23a	23a	4	4	4	4	4
Field Parameters																							
Headspace by PID (ppm)							13.1	170.3	170.3	30.3	5.5	5.5	3.3	1.1	0.2	0.4	0.5	1.8	0.4	0.7	1	1.2	0.8
Physical Tests																							
% Moisture							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydrocarbons																							
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			39	61	77	79	34	45	121	-	< 20	< 20	< 20	50	-	< 20	-	83	< 20
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			72	66	82	100	152	170	174	-	22	26	< 20	49	-	30	-	96	< 20
LEPH	**1000***	HH/EH	2000	HH/EH			39	60	76	79	34	44	121	-	< 20	< 20	< 20	49	-	< 20	-	83	< 20
HEPH	**1000***	HH/EH	5000	HH/EH			72	66	82	100	152	170	174	-	22	26	< 20	49	-	30	-	96	< 20
VPH	**200**	HH/EH	200	HH/EH			< 10	34	42	< 10	< 10	< 10	-	< 10	-	< 10	< 10	12	< 10	-	< 10	< 10	-
VH(C6-C10)	**200***	HH/EH	200	HH/EH			< 10	36	44	< 10	< 10	< 10	-	< 10	-	< 10	< 10	12	< 10	-	< 10	< 10	-
Polycyclic Aromatic Hydrocarbons (PAHs)																							
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	< 0.005	0.012	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.005	-	< 0.005	< 0.005
Acenaphthylene					320	AW	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.005	-	< 0.005	< 0.005
Anthracene	**2.5**	T	30	T	2.5	SC	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	-	< 0.004	< 0.004	< 0.004	< 0.004	-	< 0.004	-	< 0.004	< 0.004
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	-	< 0.03	< 0.03	< 0.03	< 0.03	-	< 0.03	-	< 0.03	< 0.03
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	< 0.03	< 0.03	< 0.03	0.03	< 0.03	< 0.03	< 0.03	-	< 0.03	< 0.03	< 0.03	< 0.03	-	< 0.03	-	< 0.03	< 0.03
Benzo(b)fluoranthene					0.1	AL	< 0.05	< 0.05	< 0.05	0.07	< 0.05	< 0.05	0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
Benzo(g,h,i)perylene							< 0.05	< 0.05	< 0.05	0.15	< 0.05	< 0.05	0.12	-	< 0.05	0.05	< 0.05	0.06	-	< 0.05	-	0.05	< 0.05
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
Benzo[j]fluoranthene		EH					< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
Chrysene	**400**	HH	4500	HH	6.2	EI	< 0.05	< 0.05	< 0.05	0.14	< 0.05	< 0.05	0.09	-	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	-	0.05	< 0.05
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	0.005	0.005	0.005	0.007	< 0.005	< 0.005	0.006	-	< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.005	-	< 0.005	< 0.005
Fluoranthene	**50**	T	200	T	15.4	EI	< 0.01	< 0.01	< 0.01	0.04	< 0.01	< 0.01	0.01	-	< 0.01	< 0.01	< 0.01	0.01	-	< 0.01	-	0.01	< 0.01
B[a]P TPE					5.3		< 0.05	< 0.05	< 0.05	0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
Benzo(b+j)fluoranthene	**1**	EH	10	EH			< 0.05	< 0.05	< 0.05	0.07	< 0.05	< 0.05	0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
Fluorene	**1000**	HH	9500	HH	0.25	AW	< 0.02	< 0.02	< 0.02	0.05	< 0.02	< 0.02	< 0.02	-	< 0.02	< 0.02	< 0.02	0.06	-	< 0.02	-	< 0.02	< 0.02
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	-	< 0.02	< 0.02	< 0.02	< 0.02	-	< 0.02	-	< 0.02	< 0.02
IACR					1.0		< 0.6	< 0.6	< 0.6	1.0	< 0.6	< 0.6	0.8	-	< 0.6	< 0.6	< 0.6	< 0.6	-	< 0.6	-	0.6	< 0.6
Naphthalene	**0.6**	T	20	T	0.013	AW	0.022	0.387	0.471	0.016	0.022	0.026	0.02	-	< 0.005	< 0.005	< 0.005	0.187	-	< 0.005	-	< 0.005	< 0.005
Phenanthrene	**5**	EH	50	EH	0.046	AW	0.06	0.07	0.07	0.28	< 0.02	< 0.02	0.04	-	0.02	0.02	< 0.02	0.18	-	< 0.02	-	0.08	< 0.02
Pyrene	**10**	EH	100	HH	0.1	EI	< 0.01	0.01	0.01	0.08	< 0.01	< 0.01	0.05	-	< 0.01	< 0.01	< 0.01	0.02	-	< 0.01	-	0.03	< 0.01
Quinoline	**4.5**	HH	10	HH			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
2-Methylnaphthalene	**100**	HH	950	HH			0.045	0.119	0.19	0.064	0.023	0.028	0.164	-	0.005	< 0.005	< 0.005	0.446	-	< 0.005	-	0.013	< 0.005
1-Methylnaphthalene	**500**	HH	1000	HH			0.028	0.108	0.144	0.067	0.015	0.018	0.09	-	0.005	< 0.005	< 0.005	0.292	-	< 0.005	-	0.016	< 0.005
Low Molecular Weight PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
High Molecular Weight PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

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* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_n(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

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Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-TP17-56	K19-TP17-56	K19-TP17-57	K19-TP17-57	K19-TP17-57	K19-TP17-58	K19-TP17-58	K19-TP17-59	K19-TP17-60	K19-TP17-60	K19-TP17-61	K19-TP17-61	K19-TP17-61	K19-TP17-62	K19-TP17-62	K19-TP17-62	K19-TP17-62
Sample Control Number							03821-03	03821-04	03821-05	03821-06	03821-09	03821-12	03822-01	03822-05	03822-10	03822-11	03822-12	03823-01	03823-04	03823-05	03823-06	03823-07	03823-08
Laboratory Report Number							17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971
Date Sampled							15-Jul-17	15-Jul-17	15-Jul-17	15-Jul-17	15-Jul-17	15-Jul-17	15-Jul-17	15-Jul-17	16-Jul-17	16-Jul-17	16-Jul-17	16-Jul-17	16-Jul-17	16-Jul-17	16-Jul-17	16-Jul-17	16-Jul-17
Depth of Sample (m bgs)							2.5	**4.0**	0.6	0.6	**4.0**	2.5	**4.0**	2.6	**3.7**	**4.2**	0.6	1.5	**4.4**	0.6	0.6	1.7	2.5
QA/QC									FDA	FD										FDA	FD		
APEC							4	4	4	4	4	13	13	13	13	13	13	13	13	1e	1e	1e	1e
Field Parameters																							
Headspace by PID (ppm)							2	2.8	4	4	2.5	0.7	0.9	0.8	1.8	1.5	4.8	8.1	2.5	1.3	1.3	1.6	1.5
Physical Tests																							
% Moisture							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydrocarbons																							
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			-	28	< 20	-	77	< 20	47	< 20	46	46	-	< 20	26	313	252	-	50
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			-	36	< 20	-	72	29	46	35	49	48	-	34	27	280	284	-	88
LEPH	**1000***	HH/EH	2000	HH/EH			-	28	< 20	-	77	< 20	47	< 20	46	46	-	< 20	26	313	252	-	50
HEPH	**1000***	HH/EH	5000	HH/EH			-	36	< 20	-	72	29	46	35	49	48	-	34	27	280	284	-	88
VPH	**200**	HH/EH	200	HH/EH			< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	-	< 10	< 10	< 10	-	-	< 10	-
VH(C6-C10)	**200***	HH/EH	200	HH/EH			< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	-	< 10	< 10	< 10	-	-	< 10	-
Polycyclic Aromatic Hydrocarbons (PAHs)																							
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	-	< 0.005	< 0.005	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.005
Acenaphthylene					320	AW	-	< 0.005	< 0.005	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.005
Anthracene	**2.5**	T	30	T	2.5	SC	-	< 0.004	< 0.004	-	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	-	< 0.004	< 0.004	< 0.004	< 0.004	-	< 0.004
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	-	< 0.03	< 0.03	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	-	< 0.03	< 0.03	< 0.03	< 0.03	-	< 0.03
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	-	< 0.03	< 0.03	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	-	< 0.03	< 0.03	< 0.03	< 0.03	-	< 0.03
Benzo(b)fluoranthene					0.1	AL	-	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Benzo(g,h,i)perylene							-	< 0.05	< 0.05	-	0.11	< 0.05	0.07	0.05	0.09	0.09	-	< 0.05	0.07	< 0.05	< 0.05	-	0.08
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	-	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Benzo[j]fluoranthene		EH					-	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Chrysene	**400**	HH	4500	HH	6.2	EI	-	< 0.05	< 0.05	-	0.1	< 0.05	< 0.05	< 0.05	0.06	0.05	-	< 0.05	0.06	< 0.05	< 0.05	-	0.05
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	-	< 0.005	< 0.005	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	-	0.007	0.005	< 0.005	< 0.005	-	0.008
Fluoranthene	**50**	T	200	T	15.4	EI	-	< 0.01	< 0.01	-	0.01	< 0.01	0.01	< 0.01	0.02	0.02	-	< 0.01	0.02	< 0.01	< 0.01	-	< 0.01
B[a]P TPE					5.3		-	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Benzo(b+j)fluoranthene	**1**	EH	10	EH			-	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Fluorene	**1000**	HH	9500	HH	0.25	AW	-	< 0.02	< 0.02	-	< 0.02	< 0.02	0.02	< 0.02	< 0.02	0.03	-	< 0.02	< 0.02	< 0.02	< 0.02	-	< 0.02
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	-	< 0.02	< 0.02	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	-	< 0.02	< 0.02	< 0.02	< 0.02	-	< 0.02
IACR					1.0		-	< 0.6	< 0.6	-	0.6	< 0.6	< 0.6	< 0.6	0.6	0.6	-	0.6	0.6	< 0.6	< 0.6	-	0.6
Naphthalene	**0.6**	T	20	T	0.013	AW	-	< 0.005	< 0.005	-	< 0.005	< 0.005	0.015	< 0.005	0.012	0.084	-	< 0.005	0.025	< 0.005	< 0.005	-	< 0.005
Phenanthrene	**5**	EH	50	EH	0.046	AW	-	0.06	< 0.02	-	0.07	< 0.02	0.13	< 0.02	0.11	0.16	-	0.02	0.14	< 0.02	< 0.02	-	0.05
Pyrene	**10**	EH	100	HH	0.1	EI	-	0.01	< 0.01	-	0.07	< 0.01	0.03	0.01	0.04	0.04	-	< 0.01	0.04	< 0.01	< 0.01	-	0.01
Quinoline	**4.5**	HH	10	HH			-	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
2-Methylnaphthalene	**100**	HH	950	HH			-	0.026	< 0.005	-	0.005	< 0.005	0.113	< 0.005	0.052	0.239	-	< 0.005	0.126	< 0.005	< 0.005	-	< 0.005
1-Methylnaphthalene	**500**	HH	1000	HH			-	0.018	< 0.005	-	0.009	< 0.005	0.071	0.005	0.039	0.156	-	0.006	0.085	0.023	0.014	-	0.013
Low Molecular Weight PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
High Molecular Weight PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_n(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-TP17-62	K19-TP17-63	K19-TP17-63	K19-TP17-64	K19-TP17-64	K19-TP17-65	K19-TP17-65	K19-TP17-65	K19-TP17-65	K19-TP17-66	K19-TP17-66	K19-TP17-67	K19-TP17-67	K19-TP17-68	K19-TP17-68	K19-TP17-68	K19-TP17-69
Sample Control Number							03823-10	03823-12	03824-02	03824-05	03824-06	03824-08	03824-09	03824-10	03824-11	03825-01	03825-02	03825-04	03825-07	03825-09	03825-11	03826-01	03826-04
Laboratory Report Number							17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971
Date Sampled							16-Jul-17	16-Jul-17	16-Jul-17	17-Jul-17	17-Jul-17	17-Jul-17	17-Jul-17	17-Jul-17	17-Jul-17	17-Jul-17	17-Jul-17	17-Jul-17	17-Jul-17	18-Jul-17	18-Jul-17	18-Jul-17	18-Jul-17
Depth of Sample (m bgs)							**4.2**	1.9	**4.0**	2.6	**4.2**	1.5	1.5	2.6	**4.1**	1.6	2.5	0.5	2.5	0.6	2.5	**4.1**	2.6
QA/QC												FDA	FD										
APEC							1e	23a	23a	17	17	4	4	4	4	17	17	16	16	7b	7b	7b	1b
Field Parameters																							
Headspace by PID (ppm)							1.5	112.4	2.9	0.3	0.5	0.3	0.3	0.6	0.4	0.6	0.7	0.6	0.7	1.5	271.4	4.2	8.4
Physical Tests																							
% Moisture							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydrocarbons																							
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			-	123	27	20	-	< 20	< 20	-	50	< 20	-	-	< 20	< 20	456	77	-
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			-	< 20	31	30	-	< 20	< 20	-	50	26	-	-	< 20	23	24	35	-
LEPH	**1000***	HH/EH	2000	HH/EH			-	123	27	20	-	< 20	< 20	-	50	< 20	-	-	< 20	< 20	456	76	-
HEPH	**1000***	HH/EH	5000	HH/EH			-	< 20	31	30	-	< 20	< 20	-	49	26	-	-	< 20	23	24	35	-
VPH	**200**	HH/EH	200	HH/EH			< 10	< 10	< 10	-	14	-	-	< 10	-	-	< 10	< 10	< 10	< 10	16	< 10	< 10
VH(C6-C10)	**200***	HH/EH	200	HH/EH			< 10	< 10	< 10	-	14	-	-	< 10	-	-	< 10	< 10	< 10	< 10	16	< 10	< 10
Polycyclic Aromatic Hydrocarbons (PAHs)																							
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	-	< 0.005	< 0.005	< 0.005	-	< 0.005	< 0.005	-	< 0.005	< 0.005	-	-	< 0.005	< 0.005	< 0.005	< 0.005	-
Acenaphthylene					320	AW	-	< 0.005	< 0.005	< 0.005	-	< 0.005	< 0.005	-	< 0.005	< 0.005	-	-	< 0.005	< 0.005	< 0.005	< 0.005	-
Anthracene	**2.5**	T	30	T	2.5	SC	-	< 0.004	< 0.004	< 0.004	-	< 0.004	< 0.004	-	< 0.004	< 0.004	-	-	< 0.004	< 0.004	< 0.004	< 0.004	-
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	-	< 0.03	< 0.03	< 0.03	-	< 0.03	< 0.03	-	< 0.03	< 0.03	-	-	< 0.03	< 0.03	< 0.03	< 0.03	-
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	-	< 0.03	< 0.03	< 0.03	-	< 0.03	< 0.03	-	< 0.03	< 0.03	-	-	< 0.03	< 0.03	< 0.03	< 0.03	-
Benzo(b)fluoranthene					0.1	AL	-	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	-
Benzo(g,h,i)perylene							-	< 0.05	0.06	0.05	-	< 0.05	< 0.05	-	0.1	< 0.05	-	-	< 0.05	< 0.05	< 0.05	0.07	-
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	-	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	-
Benzo[j]fluoranthene		EH					-	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	-
Chrysene	**400**	HH	4500	HH	6.2	EI	-	< 0.05	< 0.05	0.05	-	< 0.05	< 0.05	-	0.07	< 0.05	-	-	< 0.05	< 0.05	< 0.05	0.05	-
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	-	< 0.005	< 0.005	0.007	-	< 0.005	< 0.005	-	< 0.005	0.007	-	-	0.006	0.005	< 0.005	< 0.005	-
Fluoranthene	**50**	T	200	T	15.4	EI	-	< 0.01	0.01	0.01	-	< 0.01	< 0.01	-	0.03	< 0.01	-	-	< 0.01	< 0.01	0.01	0.02	-
B[a]P TPE					5.3		-	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	-
Benzo(b+j)fluoranthene	**1**	EH	10	EH			-	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	-
Fluorene	**1000**	HH	9500	HH	0.25	AW	-	< 0.02	0.04	< 0.02	-	< 0.02	< 0.02	-	0.08	< 0.02	-	-	< 0.02	< 0.02	0.1	0.09	-
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	-	< 0.02	< 0.02	< 0.02	-	< 0.02	< 0.02	-	< 0.02	< 0.02	-	-	< 0.02	< 0.02	< 0.02	< 0.02	-
IACR					1.0		-	< 0.6	< 0.6	0.6	-	< 0.6	< 0.6	-	0.6	0.6	-	-	0.6	< 0.6	< 0.6	0.6	-
Naphthalene	**0.6**	T	20	T	0.013	AW	-	< 0.005	0.027	0.006	-	< 0.005	< 0.005	-	0.208	< 0.005	-	-	< 0.005	< 0.005	< 0.005	0.218	-
Phenanthrene	**5**	EH	50	EH	0.046	AW	-	0.03	0.14	0.05	-	< 0.02	< 0.02	-	0.26	0.02	-	-	0.02	< 0.02	0.09	0.22	-
Pyrene	**10**	EH	100	HH	0.1	EI	-	< 0.01	0.03	0.01	-	< 0.01	< 0.01	-	0.05	< 0.01	-	-	< 0.01	< 0.01	0.01	0.04	-
Quinoline	**4.5**	HH	10	HH			-	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	-
2-Methylnaphthalene	**100**	HH	950	HH			-	< 0.005	0.17	0.011	-	< 0.005	< 0.005	-	0.501	< 0.005	-	-	< 0.005	< 0.005	< 0.005	0.46	-
1-Methylnaphthalene	**500**	HH	1000	HH			-	0.062	0.105	0.015	-	< 0.005	< 0.005	-	0.334	0.005	-	-	0.005	< 0.005	0.071	0.317	-
Low Molecular Weight PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
High Molecular Weight PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_m(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-TP17-69	K19-TP17-70	K19-TP17-70	K19-TP17-70	K19-TP17-71	K19-TP17-71	K19-TP17-71	K19-TP17-72	K19-TP17-73	K19-TP17-74	K19-TP17-74	K19-TP17-75	K19-TP17-75	K19-TP17-76	K19-TP17-76	K19-TP17-76	K19-TP17-77
Sample Control Number							03826-06	03826-10	03826-11	03826-12	03827-01	03827-03	03827-04	03827-08	03827-11	03828-02	03828-03	03828-06	03828-09	03828-10	03828-11	03829-02	03829-03
Laboratory Report Number	**BC CSR Standards for WL_R(< 3m) Stage10_3**	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036
Date Sampled							18-Jul-17	18-Jul-17	18-Jul-17	18-Jul-17	18-Jul-17	18-Jul-17	18-Jul-17	19-Jul-17	19-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17
Depth of Sample (m bgs)							**5.1**	2.4	**3.5**	**4.9**	0.5	2.5	2.5	2.4	1.4	1.6	1.6	0.6	**3.0**	0.7	1.7	**3.2**	0.6
QA/QC												FDA	FD			FDA	FD						
APEC							1b	1b	1b	1b	23a	23a	23a	27	27	12	12	12	12	12	12	12	11
Field Parameters																							
Headspace by PID (ppm)							3.5	19.4	21.6	17.3	5.6	2.3	2.3	3	0.4	0.7	0.7	0.5	1.1	1.1	0.8	1.6	0.3
Physical Tests																							
% Moisture							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydrocarbons																							
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			104	-	-	121	-	< 20	< 20	48	126	< 20	-	< 20	-	-	< 20	55	-
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			126	-	-	181	-	< 20	< 20	54	163	22	-	29	-	-	28	58	-
LEPH	**1000***	HH/EH	2000	HH/EH			104	-	-	121	-	< 20	< 20	48	126	< 20	-	< 20	-	-	< 20	55	-
HEPH	**1000***	HH/EH	5000	HH/EH			126	-	-	180	-	< 20	< 20	53	163	22	-	29	-	-	28	58	-
VPH	**200**	HH/EH	200	HH/EH			< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	14	< 10	-	16	< 10
VH(C6-C10)	**200***	HH/EH	200	HH/EH			< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	14	< 10	-	16	< 10
Polycyclic Aromatic Hydrocarbons (PAHs)																							
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	< 0.005	-	-	< 0.005	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.005	-	-	0.009	< 0.005	-
Acenaphthylene					320	AW	< 0.005	-	-	< 0.005	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.005	-	-	< 0.005	< 0.005	-
Anthracene	**2.5**	T	30	T	2.5	SC	< 0.004	-	-	< 0.004	-	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	-	< 0.004	-	-	0.023	< 0.004	-
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	< 0.03	-	-	< 0.03	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	-	< 0.03	-	-	< 0.03	< 0.03	-
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	< 0.03	-	-	< 0.03	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	-	< 0.03	-	-	< 0.03	< 0.03	-
Benzo(b)fluoranthene					0.1	AL	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	-
Benzo(g,h,i)perylene							0.06	-	-	0.06	-	< 0.05	< 0.05	< 0.05	0.07	< 0.05	-	< 0.05	-	-	< 0.05	0.07	-
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	-
Benzo[j]fluoranthene		EH					< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	-
Chrysene	**400**	HH	4500	HH	6.2	EI	0.07	-	-	0.06	-	< 0.05	< 0.05	0.05	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	0.06	-
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	< 0.005	-	-	< 0.005	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.005	-	-	< 0.005	< 0.005	-
Fluoranthene	**50**	T	200	T	15.4	EI	0.01	-	-	0.01	-	0.01	0.01	< 0.01	< 0.01	< 0.01	-	< 0.01	-	-	< 0.01	0.02	-
B[a]P TPE					5.3		< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	-
Benzo(b+j)fluoranthene	**1**	EH	10	EH			< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	-
Fluorene	**1000**	HH	9500	HH	0.25	AW	< 0.02	-	-	< 0.02	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	-	< 0.02	-	-	< 0.02	0.07	-
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	< 0.02	-	-	< 0.02	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	-	< 0.02	-	-	< 0.02	< 0.02	-
IACR					1.0		0.6	-	-	0.6	-	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	-	< 0.6	-	-	< 0.6	0.6	-
Naphthalene	**0.6**	T	20	T	0.013	AW	< 0.005	-	-	< 0.005	-	< 0.005	0.006	< 0.005	< 0.005	< 0.005	-	< 0.005	-	-	< 0.005	0.225	-
Phenanthrene	**5**	EH	50	EH	0.046	AW	0.09	-	-	0.06	-	0.05	0.07	0.04	0.06	< 0.02	-	< 0.02	-	-	0.02	0.22	-
Pyrene	**10**	EH	100	HH	0.1	EI	0.03	-	-	0.03	-	< 0.01	< 0.01	0.02	0.01	< 0.01	-	< 0.01	-	-	< 0.01	0.04	-
Quinoline	**4.5**	HH	10	HH			< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	-
2-Methylnaphthalene	**100**	HH	950	HH			< 0.005	-	-	< 0.005	-	< 0.005	< 0.005	0.008	0.013	< 0.005	-	< 0.005	-	-	< 0.005	0.524	-
1-Methylnaphthalene	**500**	HH	1000	HH			< 0.005	-	-	0.015	-	0.006	0.008	0.012	0.022	< 0.005	-	< 0.005	-	-	0.006	0.382	-
Low Molecular Weight PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
High Molecular Weight PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

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Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_n(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

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23	Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

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Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-TP17-77	K19-TP17-77	K19-TP17-78	K19-TP17-78	K19-TP17-79	K19-TP17-80	K19-TP17-80	K19-TP17-80	K19-TP17-80	K19-TP17-81	K19-TP17-81	K19-TP17-82	K19-TP17-82	K19-TP17-82	K19-TP17-82	K19-TP17-83	K19-TP17-83
Sample Control Number	**BC CSR Standards for WL_R(< 3m) Stage10_3**	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	03829-04	03829-06	03829-07	03829-10	03840-03	03840-05	03840-06	03840-07	03840-08	03840-09	03840-11	03841-02	03841-03	03841-04	03841-05	03841-07	03841-09
Laboratory Report Number							17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036
Date Sampled							20-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17
Depth of Sample (m bgs)							1.7	**3.3**	0.7	**3.2**	**3.0**	1.4	2.6	**3.7**	**4.3**	0.6	2.6	1.4	1.4	2.5	**4.2**	1.5	**3.9**
QA/QC																		FDA	FD				
APEC							11	11	11	11	1b	13	13	13	13	13	13	13	13	13	13	23a	23a
Field Parameters																							
Headspace by PID (ppm)							0.4	0.8	0.5	0.9	2.8	0.7	209.4	0	0	0.7	10.3	17.5	17.5	4.3	2.1	0.5	1
Physical Tests																							
% Moisture							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydrocarbons																							
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			< 20	38	< 20	44	77	< 20	383	25	-	< 20	< 20	304	485	< 20	-	< 20	28
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			35	40	22	46	79	< 20	33	33	-	20	28	31	42	20	-	< 20	28
LEPH	**1000***	HH/EH	2000	HH/EH			< 20	38	< 20	44	76	< 20	383	25	-	< 20	< 20	304	485	< 20	-	< 20	27
HEPH	**1000***	HH/EH	5000	HH/EH			35	40	22	45	79	< 20	33	33	-	20	28	31	41	20	-	< 20	28
VPH	**200**	HH/EH	200	HH/EH			-	12	< 10	12	< 10	-	< 10	-	< 10	< 10	< 10	< 10	< 10	-	< 10	< 10	14
VH(C6-C10)	**200***	HH/EH	200	HH/EH			-	12	< 10	12	< 10	-	< 10	-	< 10	< 10	< 10	< 10	< 10	-	< 10	< 10	14
Polycyclic Aromatic Hydrocarbons (PAHs)																							
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.005	< 0.005
Acenaphthylene					320	AW	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.005	< 0.005
Anthracene	**2.5**	T	30	T	2.5	SC	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	-	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	-	< 0.004	< 0.004
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	-	< 0.03	< 0.03
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	-	< 0.03	< 0.03
Benzo(b)fluoranthene					0.1	AL	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05
Benzo(g,h,i)perylene							< 0.05	0.06	< 0.05	0.06	0.06	< 0.05	< 0.05	0.06	-	< 0.05	0.08	< 0.05	< 0.05	< 0.05	-	< 0.05	0.05
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05
Benzo[j]fluoranthene		EH					< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05
Chrysene	**400**	HH	4500	HH	6.2	EI	0.05	0.05	< 0.05	0.05	0.06	< 0.05	< 0.05	0.05	-	< 0.05	0.08	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.005	< 0.005	-	< 0.005	0.009	0.005	0.008	0.006	-	< 0.005	< 0.005
Fluoranthene	**50**	T	200	T	15.4	EI	0.01	0.02	< 0.01	0.02	0.01	< 0.01	< 0.01	0.02	-	< 0.01	0.01	< 0.01	< 0.01	0.01	-	< 0.01	0.01
B[a]P TPE					5.3		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05
Benzo(b+j)fluoranthene	**1**	EH	10	EH			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05
Fluorene	**1000**	HH	9500	HH	0.25	AW	< 0.02	0.02	< 0.02	0.06	0.04	< 0.02	< 0.02	< 0.02	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	-	< 0.02	0.07
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	-	< 0.02	< 0.02
IACR					1.0		< 0.6	0.6	< 0.6	0.6	0.6	< 0.6	< 0.6	0.6	-	< 0.6	0.8	< 0.6	0.6	0.6	-	< 0.6	< 0.6
Naphthalene	**0.6**	T	20	T	0.013	AW	< 0.005	0.089	< 0.005	0.048	0.019	< 0.005	0.021	0.011	-	< 0.005	< 0.005	0.008	< 0.005	< 0.005	-	< 0.005	0.159
Phenanthrene	**5**	EH	50	EH	0.046	AW	0.03	0.16	< 0.02	0.17	0.18	< 0.02	0.04	0.12	-	< 0.02	0.04	0.03	0.05	0.04	-	< 0.02	0.19
Pyrene	**10**	EH	100	HH	0.1	EI	0.01	0.04	< 0.01	0.04	0.03	< 0.01	0.01	0.05	-	< 0.01	0.03	< 0.01	< 0.01	0.01	-	< 0.01	0.03
Quinoline	**4.5**	HH	10	HH			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05
2-Methylnaphthalene	**100**	HH	950	HH			0.007	0.227	< 0.005	0.219	0.183	< 0.005	< 0.005	0.064	-	< 0.005	< 0.005	< 0.005	< 0.005	0.009	-	< 0.005	0.425
1-Methylnaphthalene	**500**	HH	1000	HH			0.012	0.165	< 0.005	0.152	0.113	< 0.005	0.054	0.055	-	< 0.005	0.02	0.029	0.049	0.013	-	< 0.005	0.272
Low Molecular Weight PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
High Molecular Weight PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PAHs							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_w(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30	Exceeds CSR WLR (<3m) standard
30	Exceeds CSR IL (>3m) standard
23	Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 13
Results of Soil Analyses - Petroleum Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-TP17-84	K19-TP17-85	K19-TP17-85	K19-TP17-86	K19-TP17-86	K19-TP17-87	K19-TP17-87
Sample Control Number							03841-12	03842-04	03842-05	03842-08	03842-11	03843-02	03843-04
Laboratory Report Number							17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036
Date Sampled							21-Jul-17	22-Jul-17	22-Jul-17	22-Jul-17	22-Jul-17	22-Jul-17	22-Jul-17
Depth of Sample (m bgs)							1.6	1.5	2.5	0.7	**4.0**	2.8	**4.8**
QA/QC													
APEC							7a	13	13	15	15	26	26
Field Parameters													
Headspace by PID (ppm)							1	0.8	0.2	0	0.7	5.4	1.2
Physical Tests													
% Moisture							-	-	-	-	-	-	-
Hydrocarbons													
F1 - BTEX	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-
F1 (C6-C10)	**200***	HH/EH	200	HH/EH	30		-	-	-	-	-	-	-
F2 (C10-C16)	**1000***	HH/EH	2000	HH/EH	150		-	-	-	-	-	-	-
F3 (C16-C34)	**1000***	HH/EH	5000	HH/EH	300		-	-	-	-	-	-	-
F4 (C34-C50)					2800		-	-	-	-	-	-	-
EPH(C10-<C19)	**1000***	HH/EH	2000	HH/EH			< 20	< 20	< 20	< 20	-	46	29
EPH(C19-C32)	**1000***	HH/EH	5000	HH/EH			23	21	< 20	< 20	-	76	34
LEPH	**1000***	HH/EH	2000	HH/EH			< 20	< 20	< 20	< 20	-	46	28
HEPH	**1000***	HH/EH	5000	HH/EH			23	21	< 20	< 20	-	76	34
VPH	**200**	HH/EH	200	HH/EH			< 10	< 10	-	< 10	< 10	< 10	< 10
VH(C6-C10)	**200***	HH/EH	200	HH/EH			< 10	< 10	-	< 10	< 10	< 10	< 10
Polycyclic Aromatic Hydrocarbons (PAHs)													
Acenaphthene	**2000**	HH	15000	HH	0.28	AW	0.006	< 0.005	0.005	< 0.005	-	< 0.005	< 0.005
Acenaphthylene					320	AW	< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.005	< 0.005
Anthracene	**2.5**	T	30	T	2.5	SC	< 0.004	< 0.004	< 0.004	< 0.004	-	< 0.004	< 0.004
Benz(a)anthrancene	**1**	EH	10	EH	0.1	AL	< 0.03	< 0.03	< 0.03	< 0.03	-	< 0.03	< 0.03
Benzo(a)pyrene	**10**	I	50	I	0.6	EI	< 0.03	< 0.03	< 0.03	< 0.03	-	< 0.03	< 0.03
Benzo(b)fluoranthene					0.1	AL	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05
Benzo(g,h,i)perylene							< 0.05	< 0.05	< 0.05	< 0.05	-	0.09	0.05
Benzo(k)fluoranthene	**1**	EH	10	EH	0.1	AL	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05
Benzo[j]fluoranthene		EH					< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05
Chrysene	**400**	HH	4500	HH	6.2	EI	< 0.05	< 0.05	< 0.05	< 0.05	-	0.08	< 0.05
Dibenz(a,h)anthracene	**1**	EH	10	EH	0.1	AL	0.007	< 0.005	< 0.005	< 0.005	-	0.006	< 0.005
Fluoranthene	**50**	T	200	T	15.4	EI	< 0.01	< 0.01	< 0.01	< 0.01	-	0.03	0.01
B[a]P TPE					5.3		< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05
Benzo(b+j)fluoranthene	**1**	EH	10	EH			< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05
Fluorene	**1000**	HH	9500	HH	0.25	AW	< 0.02	< 0.02	< 0.02	< 0.02	-	< 0.02	0.05
Indeno(1,2,3-c,d)pyrene	**1**	EH	10	EH	0.1	AL	< 0.02	< 0.02	< 0.02	< 0.02	-	< 0.02	< 0.02
IACR					1.0		0.6	< 0.6	< 0.6	< 0.6	-	0.6	< 0.6
Naphthalene	**0.6**	T	20	T	0.013	AW	< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.005	0.027
Phenanthrene	**5**	EH	50	EH	0.046	AW	0.02	< 0.02	0.02	< 0.02	-	0.04	0.14
Pyrene	**10**	EH	100	HH	0.1	EI	< 0.01	< 0.01	0.01	< 0.01	-	0.06	0.02
Quinoline	**4.5**	HH	10	HH			< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05
2-Methylnaphthalene	**100**	HH	950	HH			< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.005	0.156
1-Methylnaphthalene	**500**	HH	1000	HH			< 0.005	< 0.005	0.006	< 0.005	-	0.019	0.093
Low Molecular Weight PAHs							-	-	-	-	-	-	-
High Molecular Weight PAHs							-	-	-	-	-	-	-
Total PAHs							-	-	-	-	-	-	-

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

CCME Guidelines notes include: freshwater aquatic life (AW), Environmental Ingestion (EI), soil contact (SC)

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Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

* = CSR standard for VPH (C6-10) conservatively applied to F1; standard for LEPH (C10-19) conservatively applied to F2; standard for HEPH (C19-32) conservatively applied to F3; standard for VPH conservatively applied to VH_w(C6-10); standard for LEPH conservatively applied to EPH (C10-19); and standard for HEPH conservatively applied to EPH (C19-32).

B[a]P = benzo(a)pyrene; TEQ = toxicity equivalency quotient; IACR = Index of additive cancer risk; Incremental lifetime cancer risk = 1 x 10-5

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.

30 Exceeds CSR WLR (<3m) standard
30 Exceeds CSR IL (>3m) standard
23 Exceeds CCME RL/PL & AL standard

PID = Photoionization Detector used for organic vapour readings; model MiniRae 3000 calibrated with 100 ppm isobutylene.

Italics = indicates that the detection limit exceeds one or more criteria.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater

Low Molecular Weight PAHs includes those with less than four rings (acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene and phenanthrene). For non-detect PAHs, the detection limit was used in the sum.

High Molecular Weight PAHs includes those with four or more rings (benzo(a)anthracene, benzo(a)pyrene, benzo(b&j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene and pyrene). For non-detect PAHs, the detection limit was used in the sum.

Table 14
Results of Soil Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_R (< 3m) Stage10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19A-09MW-01	K19A-09MW-02	K19A-09MW-03	K19A-09MW-03	K19A-09MW-04	K19A-09MW-04	K19A-09MW-04	K19A-09MW-05	K19A-09MW-05	K19A-09MW-05	K19A-09MW-05	K19A-09MW-06	K19-10TP-03	K19-10TP-17	K19-10TP-17	K19-10TP-30	K19-10TP-42	K19A-10BH-01	K19A-10BH-01
Sample Control Number							K19A-09BH-01-4	K19A-09BH-02-2	K19A-09BH-03-1	K19A-09BH-03-4	K19A-09BH-04-3	09-DUP-01	K19A-09BH-04-7	K19A-09BH-05-1	09-DUP-02	K19A-09BH-05-4	K19A-09BH-05-8	K19A-09BH-06-2	K19-10TP-03-3	K19-10TP-17-5	K19-10TP-DUP-2	K19-10TP-30-5	K19-10TP-42-6	K19A-10BH-01-7	K19A-10BH-01-8
Laboratory Report Number							101023050	101023050	101023050	101027170	101023050	101023050	101023050	101023050	101023050	101023050	101023050	101027170	B068158	B068605	B068605	B068605	B069119	B071276	B071276
Date Sampled							20-Oct-09	20-Oct-09	20-Oct-09	22-Oct-09	20-Oct-09		21-Oct-09	21-Oct-09	21-Oct-09	21-Oct-09	21-Oct-09	22-Oct-09	5-Aug-10	6-Aug-10	6-Aug-10	8-Aug-10	9-Aug-10	12-Aug-10	12-Aug-10
Depth of Sample (m bgs)							2.4-3	0.6-1.2	0-0.6	2.4-3	1.8-2.4	1.8-2.4	6.7-7.9	0-0.6	0-0.6	1.8-2.4	**6.4-7**	0.6-1.2	0.3-0.91	2.75-3.05	2.75-3.05	2.75-3	2.75-3.05	**3.88-3.96**	2.9-3.05
QA/QC											FDA	FD		FD	FDA					FDA	FD				
APEC																									
Volatile Organic Compounds																									
Acetone	**30000**	HH	200000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	**200**	HH	550	HH			-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	< 0.050	< 0.050	-	< 0.050	-	-
Bromomethane	**45**	HH	300	HH			-	-	-	-	-	-	< 0.12	-	-	-	-	-	-	< 0.30	< 0.30	-	< 0.30	-	-
Dibromoethane							-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	**650**	HH	4,000	HH			-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	< 0.050	< 0.050	-	< 0.050	-	-
Carbon Tetrachloride	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	< 0.025	< 0.025	-	< 0.025	-	-
Chlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	< 0.025	< 0.025	-	< 0.025	-	-
Chloroethane							-	-	-	-	-	-	< 0.06	-	-	-	-	-	-	< 0.10	< 0.10	-	< 0.10	-	-
Chloroform	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	< 0.050	< 0.050	-	< 0.050	-	-
Chloromethane							-	-	-	-	-	-	< 0.12	-	-	-	-	-	-	< 0.10	< 0.10	-	< 0.10	-	-
Dichloromethane	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	< 0.1	-	-	-	-	-	-	< 0.10	< 0.26	-	< 0.10	-	-
Dibromochloromethane	**150**	HH	400	HH			-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	< 0.050	< 0.050	-	< 0.050	-	-
1,2-Dibromoethane	**7**	HH	15	HH			-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	< 0.15	< 0.25	-	< 0.057	-	-
1,2-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	< 0.025	< 0.025	-	< 0.025	-	-
1,3-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	< 0.025	< 0.025	-	< 0.025	-	-
1,4-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	< 0.025	< 0.025	-	< 0.025	-	-
Dichlorodifluoromethane	**6500**	HH	45,000	HH			-	-	-	-	-	-	< 0.06	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	< 0.025	< 0.025	-	< 0.025	-	-
1,2-Dichloroethane	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	< 0.06	-	-	-	-	-	-	*< 0.16*	*< 0.19*	-	< 0.025	-	-
1,1-Dichloroethylene	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	< 0.025	< 0.025	-	< 0.025	-	-
cis-1,2-Dichloroethylene	**5**	EH	50	EH			-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	< 0.025	< 0.025	-	< 0.025	-	-
trans-1,2-Dichloroethylene	**5**	EH	50	EH			-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	< 0.025	< 0.025	-	< 0.025	-	-
1,2-Dichloropropane	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	< 0.025	< 0.025	-	< 0.025	-	-
cis-1,3-Dichloropropylene	**5**	EH	50	EH			-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	< 0.050	< 0.050	-	< 0.050	-	-
trans-1,3-Dichloropropylene	**5**	EH	50	EH			-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	< 0.050	< 0.050	-	< 0.050	-	-
1,1,1,2-Tetrachloroethane	**550**	HH	1500	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.025	< 0.025	-	< 0.025	-	-
1,1,2,2-Tetrachloroethane	**70**	HH	150	HH	0.1	AL	-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	< 0.025	< 0.025	-	< 0.025	-	-
Tetrachloroethylene	**2.5**	AW	2.5	AW	0.1	AL	-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	< 0.025	< 0.025	-	< 0.025	-	-
1,1,1-Trichloroethane	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	< 0.025	< 0.025	-	< 0.025	-	-
1,1,2-Trichloroethane	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	< 0.025	< 0.025	-	< 0.025	-	-
Trichloroethylene	**0.3**	AW	0.3	AW	0.01		-	-	-	-	-	-	< 0.01	-	-	-	-	-	-	< 0.010	< 0.010	-	< 0.010	-	-
Trichlorofluoromethane	**9000**	HH	70,000	HH			-	-	-	-	-	-	< 0.03	-	-	-	-	-	-	< 0.20	< 0.20	-	< 0.20	-	-
Vinyl Chloride	**2**	HH	45	HH			-	-	-	-	-	-	< 0.06	-	-	-	-	-	-	< 0.060	< 0.060	-	< 0.060	-	-
Benzene	**0.035**	DW	0.035	DW	0.0068		*< 0.04*	*< 0.04*	*< 0.04*	*< 0.04*	*< 0.04*	*< 0.04*	*< 0.04*	*< 0.04*	*< 0.04*	*< 0.04*	*< 0.04*	*< 0.04*	< 0.0050	**1.7**	**2.3**	< 0.0050	**1.3**	< 0.0050	< 0.0050
Toluene	**0.5**	AW	0.5	AW	0.08		*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	< 0.020	**2.3**	**3**	< 0.020	< 0.046	< 0.020	< 0.020
Ethylbenzene	**15**	DW	15	DW	0.018		*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	< 0.010	8.7	9.6	< 0.010	4.3	0.059	0.034
Xylenes	**6.5**	DW	6.5	DW	2.4		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.040	**14**	**16**	< 0.040	**7.9**	< 0.040	< 0.040
ortho-Xylene							-	-	-	-	-	-	-	-	-	-	-	-	< 0.040	0.96	1.3	< 0.040	< 0.10	< 0.040	< 0.040
Styrene	**5**	EH	50	EH	0.1	AL	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.030	< 0.10	< 0.10	< 0.030	< 0.10	< 0.030	< 0.030
Methyl t-butyl ether (MTBE)	**8000**	HH	20000	HH			-	-	-	-	-	-	-	-	-	-	-	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
meta- & para-Xylene							-	-	-	-	-	-	-	-	-	-	-	-	< 0.040	13	15	< 0.040	7.9	< 0.040	< 0.040
1,2,3-Trichlorobenzene	**100**	EH	10000	EH	0.05	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	**2**	EH	10	EH	0.05	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	**30**	HH	250	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	**20000**	HH	150000	HH			-	-	-	-	-	-	< 1.5	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	**150**	HH	1000	HH			-	-	-	-	-	-	< 1.5	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone							-	-	-	-	-	-	< 0.6	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

1 = Qualifying ion outside of acceptance criteria. Results identified and potentially biased high.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Sample exceeds WLR standard
30	Sample exceeds CSR IL standard
23	Sample exceeds WLR standard

Table 14
Results of Soil Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_R (< 3m) $Stage10_3$	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19A-10BH-08	K19A-10BH-11	K19A-10BH-11	K19A-10MW-02	K19A-10MW-03	K19A-10MW-03	K19A-10MW-04	K19A-10MW-04	K19A-10MW-04	K19A-10MW-05	K19A-10MW-05	K19A-10MW-06	K19A-10MW-07	K19A-10MW-07	K19A-10MW-09	K19A-10MW-09	K19A-10MW-10	K19A-10MW-10	K19A-10MW-22
Sample Control Number							K19A-10BH-08-3	K19A-10BH-11-4	K19A-10BH-11-5	K19A-10MW-02-5	K19A-10MW-03-2	K19A-10MW-DUP-1	K19A-10MW-04-4	K19A-10MW-04-6	K19A-10MW-04-7	K19A-10MW-05-3	K19-DUP-2	K19A-10MW-06-4	K19A-10MW-07-3	K19A-10MW-DUP-3	K19A-10MW-09-4	K19A-DUP-4	K19A-10MW-10-2	K19A-10MW-10-5	K19A-10MW-22-1
Laboratory Report Number							B073313	B073093	B073093	B073372	B073372	B073372	B073302	B073302	B073302	B073302	B073302	B073313	B073313	B073313	B073270	B073270	B073270	B073270	B076365
Date Sampled							15-Aug-10	17-Aug-10	17-Aug-10	13-Aug-10	13-Aug-10	13-Aug-10	14-Aug-10	14-Aug-10	14-Aug-10	14-Aug-10	14-Aug-10	15-Aug-10	15-Aug-10	15-Aug-10	16-Aug-10	16-Aug-10	16-Aug-10	16-Aug-10	22-Aug-10
Depth of Sample (m bgs)							2.1-2.4	2.4-2.7	**3.05-3.35**	**3.84-3.99**	1.22-1.52	1.22-1.52	2.6-2.75	**3.8-4**	**4.6-4.8**	2.4-2.7	2.4-2.7	**3.05-3.35**	2.6-2.9	2.6-2.9	2.3-2.6	2.3-2.6	0.9-1.4	2.6-2.9	0.1-0.45
QA/QC											FDA	FD				FDA	FD		FDA	FD	FDA	FD			
APEC																									
Volatile Organic Compounds																									
Acetone	**30000**	HH	200000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	**200**	HH	550	HH			-	< 0.050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.050	< 0.050
Bromomethane	**45**	HH	300	HH			-	< 0.30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.30	< 0.30
Dibromoethane							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	**650**	HH	4,000	HH			-	< 0.050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.050	< 0.050
Carbon Tetrachloride	**5**	EH	50	EH	0.1	AL	-	< 0.025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.025	< 0.025
Chlorobenzene	**1**	EH	10	EH	0.1	AL	-	< 0.025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.025	< 0.025
Chloroethane							-	< 0.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.10	< 0.10
Chloroform	**5**	EH	50	EH	0.1	AL	-	< 0.050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.050	< 0.050
Chloromethane							-	< 0.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.10	< 0.10
Dichloromethane	**5**	EH	50	EH	0.1	AL	-	< 0.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*< 0.46*	*< 0.20*
Dibromochloromethane	**150**	HH	400	HH			-	< 0.050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.050	< 0.050
1,2-Dibromoethane	**7**	HH	15	HH			-	< 0.025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.025	< 0.025
1,2-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	< 0.025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.025	< 0.025
1,3-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	< 0.025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.025	< 0.025
1,4-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	< 0.025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.025	< 0.025
Dichlorodifluoromethane	**6500**	HH	45,000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	**5**	EH	50	EH	0.1	AL	-	< 0.025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.025	< 0.025
1,2-Dichloroethane	**5**	EH	50	EH	0.1	AL	-	< 0.025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.062	< 0.025
1,1-Dichloroethylene	**5**	EH	50	EH	0.1	AL	-	< 0.025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.025	< 0.025
cis-1,2-Dichloroethylene	**5**	EH	50	EH			-	< 0.025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.025	< 0.025
trans-1,2-Dichloroethylene	**5**	EH	50	EH			-	< 0.025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.025	< 0.025
1,2-Dichloropropane	**5**	EH	50	EH	0.1	AL	-	< 0.025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.025	< 0.025
cis-1,3-Dichloropropylene	**5**	EH	50	EH			-	< 0.050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.050	< 0.050
trans-1,3-Dichloropropylene	**5**	EH	50	EH			-	< 0.050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.050	< 0.050
1,1,1,2-Tetrachloroethane	**550**	HH	1500	HH			-	< 0.025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.025	< 0.025
1,1,2,2-Tetrachloroethane	**70**	HH	150	HH	0.1	AL	-	< 0.025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.025	0.18
Tetrachloroethylene	**2.5**	AW	2.5	AW	0.1	AL	-	< 0.025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.025	< 0.025
1,1,1-Trichloroethane	**5**	EH	50	EH	0.1	AL	-	< 0.025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.025	< 0.025
1,1,2-Trichloroethane	**5**	EH	50	EH	0.1	AL	-	< 0.025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.025	< 0.025
Trichloroethylene	**0.3**	AW	0.3	AW	0.01		-	< 0.010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.010	< 0.010
Trichlorofluoromethane	**9000**	HH	70,000	HH			-	< 0.20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.20	< 0.20
Vinyl Chloride	**2**	HH	45	HH			-	< 0.060	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.060	< 0.060
Benzene	**0.035**	DW	0.035	DW	0.0068		< 0.0050	**0.2**	< 0.012	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.012	0.0097	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.0086	*< 0.34*	**0.33**	< 0.0050
Toluene	**0.5**	AW	0.5	AW	0.08		< 0.020	< 0.025	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.32	**1.8**	< 0.025
Ethylbenzene	**15**	DW	15	DW	0.018		< 0.010	0.23	0.028	0.031	< 0.010	< 0.010	< 0.010	0.02	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.87	1.2	< 0.010
Xylenes	**6.5**	DW	6.5	DW	2.4		< 0.040	0.16	0.049	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	6.0	**8.4**	< 0.10
ortho-Xylene							< 0.040	< 0.10	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	0.38	2.7	< 0.10
Styrene	**5**	EH	50	EH	0.1	AL	< 0.030	< 0.10	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.10	< 0.10
Methyl t-butyl ether (MTBE)	**8000**	HH	20000	HH			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
meta- & para-Xylene							< 0.040	0.16	0.049	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	5.6	5.7	< 0.10
1,2,3-Trichlorobenzene	**100**	EH	10000	EH	0.05	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	**2**	EH	10	EH	0.05	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	**30**	HH	250	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	**20000**	HH	150000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	**150**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

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Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

1 = Qualifying ion outside of acceptance criteria. Results identified and potentially biased high.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Sample exceeds WLR standard
30	Sample exceeds CSR IL standard
23	Sample exceeds WLR standard

Table 14
Results of Soil Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_R (< 3m) Stage10$_3$	Notes	BC CSR Standards for IL (> 3m) Stage 10$_3$	Notes	CCME Guidelines for RL/PL & AL	Notes	K19A-10MW-22	K19A-10MW-26	K19A-10MW-26	K19A-10MW-28	K19A-10MW-28	K19B-09BH-01	K19B-10MW-12	K19-MW16-01S	K19-MW16-02	K19-MW16-03	K19-MW16-03	K19-MW16-04	K19-MW16-05	K19-MW16-06	K19-MW16-07	K19-MW16-08	K19-MW16-09	K19-MW16-09	K19-MW16-10
Sample Control Number							K19A-10MW-22-3	K19A-10MW-26-4	K19A-10MW-26-6	K19A-10MW-28-1	K19A-10MW-28-3	K19A-09BH-01-4	K19B-10MW-12-1	K19-MW16-01S/SA1	K19-MW16-02/SA2	K19-MW16-03/SA1	K19-MW16-03/SA2	K19-MW16-04/SA2	K19-MW16-05/SA2	K19-MW16-06/SA2	K19-MW16-07/SA1	K19-MW16-08/SA1	K19-MW16-09/SA2	K19-MW16-09/SA2(DUPE)	K19-MW16-10/SA1
Laboratory Report Number							B076365	B077440	B077440	B077440	B077440	101023050	B073095	B619198	B619198	B619198	B619198	B619198	B619203	B619203	B619203	B619935	B619935	B619935	B619935
Date Sampled							22-Aug-10	25-Aug-10	25-Aug-10	25-Aug-10	25-Aug-10	24-Oct-09	17-Aug-10	7-Mar-16	8-Mar-16	8-Mar-16	8-Mar-16	9-Mar-16	9-Mar-16	10-Mar-16	10-Mar-16	11-Mar-16	11-Mar-16	11-Mar-16	12-Mar-16
Depth of Sample (m bgs)							1.2-1.5	1.5-1.8	2.3-2.6	0.15-0.6	1.5-1.8	**3-3.7**	0.18-0.31	1.8-2.1	1.8-2.1	0.9-1.2	1.5-1.8	2.0-2.6	2.7-3.0	1.5	0.8-1.1	1.2-1.5	2.1-2.4 FDA	2.1-2.4 FD	0.9-1.2
QA/QC																									
APEC																									
Volatile Organic Compounds																									
Acetone	**30000**	HH	200000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	**200**	HH	550	HH			< 0.050	-	< 0.050	-	-	-	< 0.050	< 0.050	< 0.13	< 0.050	< 0.050	< 0.52	< 0.050	< 0.17	< 0.050	< 0.050	< 0.29	< 0.28	< 0.050
Bromomethane	**45**	HH	300	HH			< 0.30	-	< 0.30	-	-	-	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
Dibromoethane							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	**650**	HH	4,000	HH			< 0.050	-	< 0.050	-	-	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Carbon Tetrachloride	**5**	EH	50	EH	0.1	AL	< 0.025	-	< 0.025	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Chlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	-	< 0.025	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.042	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Chloroethane							< 0.10	-	< 0.10	-	-	-	< 0.10	< 0.10	< 0.10	< 0.25	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chloroform	**5**	EH	50	EH	0.1	AL	< 0.050	-	< 0.050	-	-	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Chloromethane							< 0.10	-	< 0.10	-	-	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dichloromethane	**5**	EH	50	EH	0.1	AL	< 0.10	-	< *1.2*	-	-	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.34	< 0.10	< 0.23	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibromochloromethane	**150**	HH	400	HH			< 0.050	-	< 0.050	-	-	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,2-Dibromoethane	**7**	HH	15	HH			< 0.072	-	< 0.025	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	-	< 0.025	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,3-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	-	< 0.025	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,4-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	-	< 0.025	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Dichlorodifluoromethane	**6500**	HH	45,000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	-	< 0.025	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	-	< 0.025	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< *0.13*	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1-Dichloroethylene	**5**	EH	50	EH	0.1	AL	< 0.025	-	< 0.025	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
cis-1,2-Dichloroethylene	**5**	EH	50	EH			< 0.025	-	< 0.025	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
trans-1,2-Dichloroethylene	**5**	EH	50	EH			< 0.025	-	< 0.025	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichloropropane	**5**	EH	50	EH	0.1	AL	< 0.025	-	< 0.025	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
cis-1,3-Dichloropropylene	**5**	EH	50	EH			< 0.050	-	< 0.050	-	-	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
trans-1,3-Dichloropropylene	**5**	EH	50	EH			< 0.050	-	< 0.050	-	-	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,1,1,2-Tetrachloroethane	**550**	HH	1500	HH			< 0.025	-	< 0.025	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1,2,2-Tetrachloroethane	**70**	HH	150	HH	0.1	AL	< 0.025	-	< 0.025	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Tetrachloroethylene	**2.5**	AW	2.5	AW	0.1	AL	< 0.025	-	< 0.025	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1,1-Trichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	-	< 0.025	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1,2-Trichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	-	< 0.025	-	-	-	< 0.025	< 0.025	< 0.12	< 0.025	< 0.025	< 0.26	< 0.025	< 0.10	< 0.025	< 0.025	< 0.11	< 0.11	< 0.025
Trichloroethylene	**0.3**	AW	0.3	AW	0.01		< 0.010	-	< 0.010	-	-	-	< 0.010	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090
Trichlorofluoromethane	**9000**	HH	70,000	HH			< 0.20	-	< 0.20	-	-	-	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Vinyl Chloride	**2**	HH	45	HH			< 0.060	-	< 0.060	-	-	-	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060
Benzene	**0.035**	DW	0.035	DW	0.0068		< 0.0070	< 0.015	**0.89**	< *0.20*	< *0.17*	< *0.04*	< 0.0050	< 0.0050	**0.071**	< 0.0074	< 0.0050	**3.8**	< 0.0050	**0.089**	< 0.0050	< 0.0050	**0.091**	**0.081**	< 0.0050
Toluene	**0.5**	AW	0.5	AW	0.08		< 0.025	< 0.020	**6**	**1.3**	**1.1**	< *0.5*	< 0.025	< 0.020	< 0.020	0.027	< 0.020	**4.3**	< 0.020	**1.2**	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Ethylbenzene	**15**	DW	15	DW	0.018		0.042	< 0.010	3.7	0.05	< *0.34*	< *0.5*	< 0.010	0.011	0.8	0.012	< 0.010	3.8	< 0.010	0.98	< 0.010	< 0.010	0.56	0.53	< 0.010
Xylenes	**6.5**	DW	6.5	DW	2.4		< 0.10	< 0.040	**23**	**28**	**20**	< 0.1	< 0.10	< 0.040	0.63	0.042	< 0.040	**21**	< 0.040	4.7	< 0.040	< 0.040	0.59	0.54	< 0.040
ortho-Xylene							< 0.10	< 0.040	5.7	12	8	-	< 0.10	< 0.040	< 0.040	< 0.040	< 0.040	1.2	< 0.040	1.5	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Styrene	**5**	EH	50	EH	0.1	AL	< 0.10	< 0.030	< 0.10	< 0.38	< 0.030	< 0.1	< 0.10	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030
Methyl t-butyl ether (MTBE)	**8000**	HH	20000	HH			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
meta- & para-Xylene							< 0.10	< 0.040	17	16	12	-	< 0.10	< 0.040	0.63	0.042	< 0.040	19	< 0.040	3.3	< 0.040	< 0.040	0.59	0.54	< 0.040
1,2,3-Trichlorobenzene	**100**	EH	10000	EH	0.05	AL	-	-	-	-	-	-	-	< 0.025	< 0.36	< 0.025	< 0.025	< 0.20	< 0.025	< 0.025	< 0.025	< 0.025	< 0.26	< 0.38	< 0.025
1,2,4-Trichlorobenzene	**2**	EH	10	EH	0.05	AL	-	-	-	-	-	-	-	< 0.025	< 0.27	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.14	< 0.17	< 0.025
Hexachlorobutadiene	**30**	HH	250	HH			-	-	-	-	-	-	-	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2-Butanone	**20000**	HH	150000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	**150**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface
Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

1 = Qualifying ion outside of acceptance criteria. Results identified and potentially biased high.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Sample exceeds WLR standard
30	Sample exceeds CSR IL standard
23	Sample exceeds WLR standard

Table 14
Results of Soil Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_{PL} (< 3m) Stage 10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-MW16-11	K19-MW16-12	K19-MW16-13	K19-MW16-14	K19-MW16-15	K19-MW16-15	K19-TP16-01	K19-TP16-01	K19-TP16-02	K19-TP16-03	K19-TP16-04	K19-TP16-05	K19-TP16-06	K19-TP16-07	K19-TP16-07	K19-TP16-09	K19-TP16-10	K19-TP16-11	K19-TP16-11
Sample Control Number							K19-MW16-11/SA1	K19-MW16-12/SA1	K19-MW16-13/SA2	K19-MW16-14/SA2	K19-MW16-15/SA1	K19-MW16-15/SA2	K19-TP16-01/SA2	K19-TP16-01/SA3	K19-TP16-02/SA2	K19-TP16-03/SA2	K19-TP16-04/SA2	K19-TP16-05/SA1	K19-TP16-06/SA2	K19-TP16-07/SA2	K19-TP16-07/SA2-DUP	K19-TP16-09/SA3	K19-TP16-10/SA2	K19-TP16-11/SA2	K19-TP16-11/SA2 DUP
Laboratory Report Number							B619935	B619935	B620735	B620735	B620735	B620735	B619198	B619198	B619198	B619198	B619198	B619198	B619198	B619198	B619198	B619206	B619206	B619206	B619206
Date Sampled							13-Mar-16	13-Mar-16	14-Mar-16	14-Mar-16	14-Mar-16	14-Mar-16	6-Mar-16	6-Mar-16	7-Mar-16	7-Mar-16	9-Mar-16	8-Mar-16	8-Mar-16	9-Mar-16	9-Mar-16	9-Mar-16	10-Mar-16	10-Mar-16	10-Mar-16
Depth of Sample (m bgs)							Unknown	0.8-1.2	1.2-1.5	1.5-1.7	0.5-1.1	1.8-2.1	2.0	**3.6**	1.5	2.9	2.2	1.9	2.4	1.5	1.5	2.8	1.9	2.0	2.0
QA/QC																				FDA	FD			FDA	FD
APEC																									
Volatile Organic Compounds																									
Acetone	**30000**	HH	200000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	**200**	HH	550	HH			< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.14	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Bromomethane	**45**	HH	300	HH			< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	-	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
Dibromoethane							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	**650**	HH	4,000	HH			< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Carbon Tetrachloride	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Chlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Chloroethane							< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chloroform	**5**	EH	50	EH	0.1	AL	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Chloromethane							< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dichloromethane	**5**	EH	50	EH	0.1	AL	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibromochloromethane	**150**	HH	400	HH			< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,2-Dibromoethane	**7**	HH	15	HH			< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,3-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,4-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Dichlorodifluoromethane	**6500**	HH	45,000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1-Dichloroethylene	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
cis-1,2-Dichloroethylene	**5**	EH	50	EH			< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
trans-1,2-Dichloroethylene	**5**	EH	50	EH			< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichloropropane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
cis-1,3-Dichloropropylene	**5**	EH	50	EH			< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
trans-1,3-Dichloropropylene	**5**	EH	50	EH			< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,1,1,2-Tetrachloroethane	**550**	HH	1500	HH			< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1,2,2-Tetrachloroethane	**70**	HH	150	HH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Tetrachloroethylene	**2.5**	AW	2.5	AW	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1,1-Trichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1,2-Trichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.12	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Trichloroethylene	**0.3**	AW	0.3	AW	0.01		< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	-	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090
Trichlorofluoromethane	**9000**	HH	70,000	HH			< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	-	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Vinyl Chloride	**2**	HH	45	HH			< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	-	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060
Benzene	**0.035**	DW	0.035	DW	0.0068		< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.013	**0.045**	0.14	< 0.0050	< 0.0050	< 0.0099	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Toluene	**0.5**	AW	0.5	AW	0.08		< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.3	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Ethylbenzene	**15**	DW	15	DW	0.018		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.079	0.56	1.7	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.031	0.028	0.19	< 0.010	< 0.010	< 0.010
Xylenes	**6.5**	DW	6.5	DW	2.4		< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	0.062	0.61	2	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	0.078	0.07	1.5	< 0.040	< 0.040	< 0.040
ortho-Xylene							< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	0.53	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	0.32	< 0.040	< 0.040	< 0.040
Styrene	**5**	EH	50	EH	0.1	AL	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.060	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030
Methyl t-butyl ether (MTBE)	**8000**	HH	20000	HH			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.20	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
meta- & para-Xylene							< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	0.062	0.61	1.5	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	0.078	0.07	1.1	< 0.040	< 0.040	< 0.040
1,2,3-Trichlorobenzene	**100**	EH	10000	EH	0.05	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.34	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.19	< 0.025	< 0.025	< 0.025
1,2,4-Trichlorobenzene	**2**	EH	10	EH	0.05	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Hexachlorobutadiene	**30**	HH	250	HH			< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	-	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2-Butanone	**20000**	HH	150000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	**150**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

1 = Qualifying ion outside of acceptance criteria. Results identified and potentially biased high.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Sample exceeds WLR standard
30	Sample exceeds CSR IL standard
23	Sample exceeds WLR standard

Table 14
Results of Soil Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_R (< 3m) Stage10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-TP16-12	K19-TP16-12	K19-TP16-12	K19-TP16-13	K19-TP16-13	K19-TP16-14	K19-TP16-14	K19-TP16-14	K19-TP16-14	K19-TP16-15	K19-TP16-15	K19-TP16-15	K19-TP16-16	K19-TP16-16	K19-TP16-17	K19-TP16-17	K19-TP16-18	K19-TP16-19	K19-TP16-20
Sample Control Number							01463-02	01463-04	01463-03	01463-08	01463-09	01463-12	01464-01	01464-04	01464-06	01465-01	01465-02	01465-03	01465-06	01465-08	01465-09	01465-10	01466-02	01466-08	01480-02
Laboratory Report Number							B674520	B674520	B674520	B674520	B674520	B674520	B674520	B674520	B674520	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675312
Date Sampled							29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16	30-Aug-16	30-Aug-16	30-Aug-16	30-Aug-16	30-Aug-16
Depth of Sample (m bgs)							1.5	2.0	2.9	2.2	**3.1**	0.9	2.0	**3.6**	**3.6**	2.1	**3.0**	**3.7**	1.0	2.0	0.5	1.0	1.0	1.0	2.9
QA/QC														FDA	FD										
APEC																									
Volatile Organic Compounds																									
Acetone	**30000**	HH	200000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	**200**	HH	550	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane	**45**	HH	300	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromoethane							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	**650**	HH	4,000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethane							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	**150**	HH	400	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane	**7**	HH	15	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	**6500**	HH	45,000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethylene	**5**	EH	50	EH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethylene	**5**	EH	50	EH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropylene	**5**	EH	50	EH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropylene	**5**	EH	50	EH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1,2-Tetrachloroethane	**550**	HH	1500	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	**70**	HH	150	HH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethylene	**2.5**	AW	2.5	AW	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene	**0.3**	AW	0.3	AW	0.01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	**9000**	HH	70,000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	**2**	HH	45	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	**0.035**	DW	0.035	DW	0.0068		0.031	0.02	**0.052**	< 0.0050	0.015	< 0.0050	-	< 0.0050	< 0.0050	0.011	0.0087	-	-	0.0084	-	< 0.0050	< 0.0050	< 0.0050	**0.057**
Toluene	**0.5**	AW	0.5	AW	0.08		< 0.020	0.025	< 0.020	< 0.020	< 0.020	0.041	-	0.19	0.022	< 0.020	< 0.020	-	-	< 0.020	-	< 0.020	< 0.020	0.1	< 0.020
Ethylbenzene	**15**	DW	15	DW	0.018		0.29	0.46	0.94	0.01	0.095	0.05	-	0.027	0.027	0.3	0.19	-	-	0.24	-	< 0.010	< 0.010	< 0.010	0.77
Xylenes	**6.5**	DW	6.5	DW	2.4		0.11	0.53	0.36	< 0.040	< 0.040	0.085	-	< 0.040	< 0.040	< 0.040	< 0.040	-	-	< 0.040	-	< 0.040	< 0.040	< 0.040	0.17
ortho-Xylene							< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	-	< 0.040	< 0.040	< 0.040	< 0.040	-	-	< 0.040	-	< 0.040	< 0.040	< 0.040	< 0.040
Styrene	**5**	EH	50	EH	0.1	AL	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	-	< 0.030	< 0.030	< 0.030	< 0.030	-	-	< 0.030	-	< 0.030	< 0.030	< 0.030	< 0.030
Methyl t-butyl ether (MTBE)	**8000**	HH	20000	HH			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10	-	-	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10
meta- & para-Xylene							0.11	0.53	0.36	< 0.040	< 0.040	0.085	-	< 0.040	< 0.040	< 0.040	< 0.040	-	-	< 0.040	-	< 0.040	< 0.040	< 0.040	0.17
1,2,3-Trichlorobenzene	**100**	EH	10000	EH	0.05	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	**2**	EH	10	EH	0.05	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	**30**	HH	250	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	**20000**	HH	150000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	**150**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

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Table 14
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K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_R (< 3m) $Stage10_3$	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-TP16-20	K19-TP16-21	K19-TP16-22	K19-TP16-23	K19-TP16-23	K19-TP16-24	K19-TP16-24	K19-TP16-25	K19-TP16-26	K19-TP16-26	K19-TP16-27	K19-TP16-27	K19-TP16-27	K19-TP16-28	K19-TP16-28	K19-TP16-29	K19-TP16-29	K19-TP16-29	K19-TP16-30
Sample Control Number							01480-04	01480-07	01481-04	01481-05	01481-07	01482-03	01482-05	01482-10	01482-12	01483-02	01483-03	01483-04	01483-06	01484-02	01484-04	01484-07	01484-11	01484-12	01485-01
Laboratory Report Number							B675312	B675312	B675549	B675549	B675549	B675549	B675549	B675549	B675549	B675549	B675549	B675549	B675549	B675954	B675954	B675954	B675954	B675954	B675954
Date Sampled							30-Aug-16	30-Aug-16	30-Aug-16	30-Aug-16	30-Aug-16	31-Aug-16	31-Aug-16	31-Aug-16	31-Aug-16	31-Aug-16	31-Aug-16	31-Aug-16	31-Aug-16	31-Aug-16	31-Aug-16	1-Sep-16	1-Sep-16	1-Sep-16	1-Sep-16
Depth of Sample (m bgs)							**3.8**	2.0	2	0.5	1.5	2.5	2.5	**3.6**	2.1	2.5	0.4	1.5	**3.5**	1.5	**3**	1.0	**3.8**	**4.3**	1
QA/QC												FDA	FD												
APEC																									
Volatile Organic Compounds																									
Acetone	**30000**	HH	200000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	**200**	HH	550	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	7.1
Bromomethane	**45**	HH	300	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.30
Dibromoethane							-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-
Bromoform	**650**	HH	4,000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.050
Carbon Tetrachloride	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.025
Chlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.025
Chloroethane							-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.10
Chloroform	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.050
Chloromethane							-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.10
Dichloromethane	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	2.4
Dibromochloromethane	**150**	HH	400	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.050
1,2-Dibromoethane	**7**	HH	15	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	0.92
1,2-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.025
1,3-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.025
1,4-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.025
Dichlorodifluoromethane	**6500**	HH	45,000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-
1,1-Dichloroethane	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	0.085
1,2-Dichloroethane	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.025
1,1-Dichloroethylene	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.025
cis-1,2-Dichloroethylene	**5**	EH	50	EH			-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.025
trans-1,2-Dichloroethylene	**5**	EH	50	EH			-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.025
1,2-Dichloropropane	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.025
cis-1,3-Dichloropropylene	**5**	EH	50	EH			-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.050
trans-1,3-Dichloropropylene	**5**	EH	50	EH			-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	0.15
1,1,1,2-Tetrachloroethane	**550**	HH	1500	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.025
1,1,2,2-Tetrachloroethane	**70**	HH	150	HH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	18
Tetrachloroethylene	**2.5**	AW	2.5	AW	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.025
1,1,1-Trichloroethane	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.11
1,1,2-Trichloroethane	**5**	EH	50	EH	0.1	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	4.8
Trichloroethylene	**0.3**	AW	0.3	AW	0.01		-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.0050
Trichlorofluoromethane	**9000**	HH	70,000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.20
Vinyl Chloride	**2**	HH	45	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	< 0.060
Benzene	**0.035**	DW	0.035	DW	0.0068		0.19	< 0.0050	<0.0050	<0.0050	<0.0050	0.013	<0.0050	<0.0050	<0.0050	**0.2**	<0.0050	<0.0050	<0.0050	0.035	0.016	< 0.0050	< 0.0050	0.75	**1.8**
Toluene	**0.5**	AW	0.5	AW	0.08		0.23	< 0.020	<0.020	<0.020	<0.020	0.087	0.039	0.064	<0.020	0.061	<0.020	<0.020	<0.020	< 0.020	0.07	0.043	1.8	1.4	**27**
Ethylbenzene	**15**	DW	15	DW	0.018		2.3	< 0.010	<0.010	<0.010	<0.010	0.14	0.075	0.011	<0.010	0.4	<0.010	<0.010	<0.010	0.078	0.13	< 0.010	7.1	1.7	8.8
Xylenes	**6.5**	DW	6.5	DW	2.4		2.4	< 0.040	<0.040	<0.040	<0.040	0.16	0.04	<0.040	<0.040	1.3	<0.040	<0.040	<0.040	0.28	0.25	< 0.040	15	3.1	**190**
ortho-Xylene							0.26	< 0.040	<0.040	<0.040	<0.040	0.057	<0.040	<0.040	<0.040	0.12	<0.040	<0.040	<0.040	< 0.040	0.061	< 0.040	1.3	0.4	64
Styrene	**5**	EH	50	EH	0.1	AL	< 0.030	< 0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030
Methyl t-butyl ether (MTBE)	**8000**	HH	20000	HH			< 0.10	< 0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
meta- & para-Xylene							2.1	< 0.040	<0.040	<0.040	<0.040	0.1	0.04	<0.040	<0.040	1.2	<0.040	<0.040	<0.040	0.28	0.19	< 0.040	13	2.7	130
1,2,3-Trichlorobenzene	**100**	EH	10000	EH	0.05	AL	-	-												-		-	-	-	< 0.025
1,2,4-Trichlorobenzene	**2**	EH	10	EH	0.05	AL	-	-												-		-	-	-	< 0.025
Hexachlorobutadiene	**30**	HH	250	HH			-	-												-		-	-	-	< 0.20
2-Butanone	**20000**	HH	150000	HH			-	-												-		-	-	-	
2-Hexanone	**150**	HH	1000	HH			-	-												-		-	-	-	
4-Methyl-2-pentanone							-	-												-		-	-	-	

Notes:

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Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

1 = Qualifying ion outside of acceptance criteria. Results identified and potentially biased high.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Sample exceeds WLR standard
30	Sample exceeds CSR IL standard
23	Sample exceeds WLR standard

Table 14
Results of Soil Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_R (< 3m) Stage10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-TP16-30	K19-TP16-30	K19-TP16-30	K19-TP16-31	K19-TP16-31	K19-TP16-32	K19-TP16-32	K19-TP16-34	K19-TP16-35	K19-TP16-35	K19-TP16-35	K19-TP16-36	K19-TP16-36	K19-TP16-37	K19-TP16-38	K19-TP16-39	K19-TP16-39	K19-TP16-40	K19-TP16-40
Sample Control Number							01485-04	01485-06	01485-07	01485-08	01485-11	01486-02	01486-03	01487-02	01487-06	01487-08	01487-09	01488-01	01488-04	01488-07	01488-11	01489-05	01489-07	01489-06	01489-08
Laboratory Report Number							B675954	B675954	B675954	B675954	B675954	B676013	B676013	B676013	B676013	B676013	B676013	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470
Date Sampled							1-Sep-16	1-Sep-16	1-Sep-16	1-Sep-16	1-Sep-16	1-Sep-16	1-Sep-16	2-Sep-16	2-Sep-16	2-Sep-16	2-Sep-16	2-Sep-16	2-Sep-16	2-Sep-16	3-Sep-16	3-Sep-16	3-Sep-16	3-Sep-16	3-Sep-16
Depth of Sample (m bgs)							2.9	**3.8**	**4.3**	0.9	2.8	2.0	2.9	**3.4**	**3.0**	**3.8**	**4.4**	1.0	2.9	2.5	1.0	2.0	2.0	0.5	1.0
QA/QC																						FDA	FD		
APEC																									
Volatile Organic Compounds																									
Acetone	**30000**	HH	200000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	**200**	HH	550	HH			6.9	2	0.82	-	-	-	-	0.61	<0.050	< 0.050	1.5	-	-	-	-	-	-	-	-
Bromomethane	**45**	HH	300	HH			< 0.30	<0.30	<0.60	-	-	-	-	< 0.30	<0.30	< 0.30	<0.30	-	-	-	-	-	-	-	-
Dibromoethane							-	-	-	-	-	-	-	-	-	< 0.050	-	-	-	-	-	-	-	-	-
Bromoform	**650**	HH	4,000	HH			< 0.050	<0.050	<0.10	-	-	-	-	< 0.050	<0.050	< 0.050	<0.050	-	-	-	-	-	-	-	-
Carbon Tetrachloride	**5**	EH	50	EH	0.1	AL	< 0.025	<0.025	<0.050	-	-	-	-	< 0.025	<0.025	< 0.025	<0.025	-	-	-	-	-	-	-	-
Chlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	0.34	<0.050	-	-	-	-	< 0.025	<0.025	< 0.025	<0.025	-	-	-	-	-	-	-	-
Chloroethane							< 0.10	<0.10	<0.20	-	-	-	-	< 0.10	<0.10	< 0.10	<0.10	-	-	-	-	-	-	-	-
Chloroform	**5**	EH	50	EH	0.1	AL	2.7	<0.050	<0.10	-	-	-	-	0.15	<0.050	< 0.050	<0.050	-	-	-	-	-	-	-	-
Chloromethane							< 0.10	<0.10	<0.20	-	-	-	-	< 0.10	<0.10	< 0.10	<0.10	-	-	-	-	-	-	-	-
Dichloromethane	**5**	EH	50	EH	0.1	AL	**12**	4.3	35	-	-	-	-	0.97	16	< 0.10	21	-	-	-	-	-	-	-	-
Dibromochloromethane	**150**	HH	400	HH			< 0.050	<0.050	<0.10	-	-	-	-	< 0.050	<0.050	< 0.050	<0.050	-	-	-	-	-	-	-	-
1,2-Dibromoethane	**7**	HH	15	HH			0.64	0.3	0.12	-	-	-	-	0.042	0.46	0.079	<0.025	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	<0.025	<0.05	-	-	-	-	< 0.025	<0.025	< 0.025	<0.025	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	<0.025	<0.05	-	-	-	-	< 0.025	<0.025	< 0.025	<0.025	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	<0.025	<0.05	-	-	-	-	< 0.025	<0.025	< 0.025	<0.025	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	**6500**	HH	45,000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	**5**	EH	50	EH	0.1	AL	0.3	0.14	<0.05	-	-	-	-	< 0.025	0.14	< 0.025	0.029	-	-	-	-	-	-	-	-
1,2-Dichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	1.6	2.1	-	-	-	-	< 0.025	1.6	0.61	1.5	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	**5**	EH	50	EH	0.1	AL	< 0.025	<0.025	<0.05	-	-	-	-	< 0.025	<0.025	< 0.025	<0.025	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethylene	**5**	EH	50	EH			< 0.025	<0.025	<0.05	-	-	-	-	< 0.025	<0.025	< 0.025	<0.025	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethylene	**5**	EH	50	EH			< 0.025	<0.025	<0.05	-	-	-	-	< 0.025	<0.025	< 0.025	<0.025	-	-	-	-	-	-	-	-
1,2-Dichloropropane	**5**	EH	50	EH	0.1	AL	0.3	0.15	0.1	-	-	-	-	< 0.025	0.22	0.06	0.13	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropylene	**5**	EH	50	EH			< 0.050	<0.050	<0.10	-	-	-	-	< 0.050	<0.050	< 0.050	<0.050	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropylene	**5**	EH	50	EH			< 0.050	<0.050	<0.10	-	-	-	-	< 0.080	<0.050	< 0.050	<0.050	-	-	-	-	-	-	-	-
1,1,1,2-Tetrachloroethane	**550**	HH	1500	HH			< 0.025	<0.025	<0.05	-	-	-	-	< 0.025	<0.025	< 0.025	<0.025	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	**70**	HH	150	HH	0.1	AL	< 0.025	<0.025	<0.05	-	-	-	-	0.61	<0.025	0.42	<0.025	-	-	-	-	-	-	-	-
Tetrachloroethylene	**2.5**	AW	2.5	AW	0.1	AL	< 0.025	<0.025	<0.05	-	-	-	-	< 0.025	<0.025	< 0.025	<0.025	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	<0.025	<0.05	-	-	-	-	< 0.025	<0.025	< 0.025	<0.025	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	**5**	EH	50	EH	0.1	AL	4.4	1.9	0.52	-	-	-	-	0.36	2.7	0.29	0.91	-	-	-	-	-	-	-	-
Trichloroethylene	**0.3**	AW	0.3	AW	0.01		< 0.0050	<0.0050	<0.0050	-	-	-	-	< 0.0050	<0.0050	< 0.0050	<0.0050	-	-	-	-	-	-	-	-
Trichlorofluoromethane	**9000**	HH	70,000	HH			< 0.20	<0.20	<0.40	-	-	-	-	< 0.20	<0.20	< 0.20	<0.20	-	-	-	-	-	-	-	-
Vinyl Chloride	**2**	HH	45	HH			< 0.060	<0.060	<0.12	-	-	-	-	< 0.060	<0.060	< 0.060	<0.060	-	-	-	-	-	-	-	-
Benzene	**0.035**	DW	0.035	DW	0.0068		**20**	13	19	0.027	0.015	**0.12**	**0.23**	4.7	19	1.7	18	<0.0050	<0.0050	<0.0050	-	**1.1**	**0.89**	**0.40**	**0.39**
Toluene	**0.5**	AW	0.5	AW	0.08		**110**	7.2	9.3	0.055	0.03	0.06	0.025	0.86	7.3	14	3.3	<0.020	<0.020	0.022	-	**0.85**	**0.72**	**0.79**	0.11
Ethylbenzene	**15**	DW	15	DW	0.018		**54**	19	7.8	< 0.010	0.026	0.7	2.5	7.3	34	9.9	16	<0.010	<0.010	<0.010	-	6.1	5.2	0.15	0.17
Xylenes	**6.5**	DW	6.5	DW	2.4		**310**	52	21	< 0.040	0.06	1.5	**10**	13	53	39	38	<0.040	<0.040	<0.040	-	**22**	**18**	**47**	2.5
ortho-Xylene							110	5.8	3.9	< 0.040	< 0.040	0.13	0.053	0.45	8.7	16	4.6	<0.040	<0.040	<0.040	-	0.37	0.37	33	0.86
Styrene	**5**	EH	50	EH	0.1	AL	< 0.030	0.25	< 0.060	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	<0.030	<0.030	<0.030	-	<0.030	<0.030	<0.030	<0.030
Methyl t-butyl ether (MTBE)	**8000**	HH	20000	HH			< 0.10	<0.10	< 0.20	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	<0.10	<0.10	<0.10	-	<0.10	<0.10	<0.10	<0.10
meta- & para-Xylene							190	47	17	< 0.040	0.06	1.4	10	13	45	24	33	<0.040	<0.040	<0.040	-	22	18	47	1.6
1,2,3-Trichlorobenzene	**100**	EH	10000	EH	0.05	AL	-	<0.025	<0.050	-	-	-	-	< 0.025	<0.025	< 0.025	<0.025	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	**2**	EH	10	EH	0.05	AL	-	<0.025	<0.050	-	-	-	-	< 0.025	<0.025	< 0.025	<0.025	-	-	-	-	-	-	-	-
Hexachlorobutadiene	**30**	HH	250	HH			-	<0.20	<0.40	-	-	-	-	< 0.20	<0.20	< 0.20	<0.20	-	-	-	-	-	-	-	-
2-Butanone	**20000**	HH	150000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	**150**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_R (< 3m) Stage10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-TP16-42	K19-TP16-42	K19-TP16-43	K19-TP16-45	K19-TP16-45	K19-TP16-46	K19-TP16-46	K19-TP16-47	K19-TP16-48	K19-TP16-49	K19-TP16-49	K19-SS16-01	K19-SS16-02	K19-SS16-04	K19-TP17-01	K19-TP17-01	K19-TP17-02	K19-TP17-03	K19-TP17-03
Sample Control Number							01490-06	01490-08	01491-02	01491-06	01491-08	01491-10	01491-12	01492-02	01492-09	01492-12	01493-01	01481-09	01481-10	01481-12	03343-03	03343-05	03343-10	03344-01	03344-04
Laboratory Report Number							B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B675549	B675549	B675549	B706358	B706358	B706358	B706358	B706358
Date Sampled							3-Sep-16	3-Sep-16	3-Sep-16	4-Sep-16	4-Sep-16	4-Sep-16	4-Sep-16	4-Sep-16	4-Sep-16	4-Sep-16	4-Sep-16	31-Aug-16	31-Aug-16	31-Aug-16	22-Jan-17	22-Jan-17	22-Jan-17	22-Jan-17	22-Jan-17
Depth of Sample (m bgs)							2.0	**3.5**	**3.0**	1.0	2.0	1.0	2.0	1.7	2.5	1.7	**3.0**	0.27	0.34	0.32	2.4	**4.2**	2.5	1.8	**3.8**
QA/QC																									
APEC																									
Volatile Organic Compounds																									
Acetone	**30000**	HH	200000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	**200**	HH	550	HH			< 0.050	-	-	-	-	< 0.050	-	-	-	-	-	<0.050	<0.050	<0.050	-	-	< 0.050	-	-
Bromomethane	**45**	HH	300	HH			< 0.30	-	-	-	-	< 0.30	-	-	-	-	-	<0.30	<0.30	<0.30	-	-	< 0.30	-	-
Dibromoethane							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	**650**	HH	4,000	HH			< 0.050	-	-	-	-	< 0.050	-	-	-	-	-	<0.050	<0.050	<0.050	-	-	< 0.050	-	-
Carbon Tetrachloride	**5**	EH	50	EH	0.1	AL	< 0.025	-	-	-	-	< 0.025	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	< 0.025	-	-
Chlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	-	-	-	-	< 0.025	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	< 0.025	-	-
Chloroethane							< 0.10	-	-	-	-	< 0.10	-	-	-	-	-	<0.10	<0.10	<0.10	-	-	< 0.10	-	-
Chloroform	**5**	EH	50	EH	0.1	AL	< 0.050	-	-	-	-	< 0.050	-	-	-	-	-	<0.050	<0.050	<0.050	-	-	< 0.050	-	-
Chloromethane							< 0.10	-	-	-	-	< 0.10	-	-	-	-	-	<0.10	<0.10	<0.10	-	-	< 0.10	-	-
Dichloromethane	**5**	EH	50	EH	0.1	AL	< 0.10	-	-	-	-	< 0.10	-	-	-	-	-	<0.10	<0.10	<0.10	-	-	< 0.10	-	-
Dibromochloromethane	**150**	HH	400	HH			< 0.050	-	-	-	-	< 0.050	-	-	-	-	-	<0.050	<0.050	<0.050	-	-	< 0.050	-	-
1,2-Dibromoethane	**7**	HH	15	HH			< 0.025	-	-	-	-	< 0.025	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	< 0.025	-	-
1,2-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	-	-	-	-	< 0.025	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	< 0.025	-	-
1,3-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	-	-	-	-	< 0.025	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	< 0.025	-	-
1,4-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	-	-	-	-	< 0.025	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	< 0.025	-	-
Dichlorodifluoromethane	**6500**	HH	45,000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	-	-	-	-	< 0.025	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	< 0.025	-	-
1,2-Dichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	-	-	-	-	< 0.025	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	< 0.025	-	-
1,1-Dichloroethylene	**5**	EH	50	EH	0.1	AL	< 0.025	-	-	-	-	< 0.025	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	< 0.025	-	-
cis-1,2-Dichloroethylene	**5**	EH	50	EH			< 0.025	-	-	-	-	< 0.025	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	< 0.025	-	-
trans-1,2-Dichloroethylene	**5**	EH	50	EH			< 0.025	-	-	-	-	< 0.025	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	< 0.025	-	-
1,2-Dichloropropane	**5**	EH	50	EH	0.1	AL	< 0.025	-	-	-	-	< 0.025	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	< 0.025	-	-
cis-1,3-Dichloropropylene	**5**	EH	50	EH			< 0.050	-	-	-	-	< 0.050	-	-	-	-	-	<0.050	<0.050	<0.050	-	-	< 0.050	-	-
trans-1,3-Dichloropropylene	**5**	EH	50	EH			< 0.080	-	-	-	-	< 0.080	-	-	-	-	-	<0.050	<0.050	<0.050	-	-	< 0.050	-	-
1,1,1,2-Tetrachloroethane	**550**	HH	1500	HH			< 0.025	-	-	-	-	< 0.025	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	< 0.025	-	-
1,1,2,2-Tetrachloroethane	**70**	HH	150	HH	0.1	AL	0.57	-	-	-	-	2.3[1]	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	0.11	-	-
Tetrachloroethylene	**2.5**	AW	2.5	AW	0.1	AL	< 0.025	-	-	-	-	< 0.025	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	< 0.025	-	-
1,1,1-Trichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	-	-	-	-	< 0.025	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	< 0.025	-	-
1,1,2-Trichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	-	-	-	-	< 0.025	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	< 0.025	-	-
Trichloroethylene	**0.3**	AW	0.3	AW	0.01		< 0.0050	-	-	-	-	< 0.0050	-	-	-	-	-	<0.0050	<0.0050	<0.0050	-	-	< 0.0050	-	-
Trichlorofluoromethane	**9000**	HH	70,000	HH			< 0.20	-	-	-	-	< 0.20	-	-	-	-	-	<0.20	<0.20	<0.20	-	-	< 0.20	-	-
Vinyl Chloride	**2**	HH	45	HH			< 0.060	-	-	-	-	< 0.060	-	-	-	-	-	<0.060	<0.060	<0.060	-	-	< 0.060	-	-
Benzene	**0.035**	DW	0.035	DW	0.0068		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	< 0.0050	< 0.0050	< 0.0050	<0.0050	< 0.0050
Toluene	**0.5**	AW	0.5	AW	0.08		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	< 0.020	< 0.020	< 0.020	<0.020	< 0.020
Ethylbenzene	**15**	DW	15	DW	0.018		0.011	0.01	<0.010	<0.010	<0.010	0.011	0.031	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	< 0.010	< 0.010	< 0.010	<0.010	< 0.010
Xylenes	**6.5**	DW	6.5	DW	2.4		<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	< 0.040	< 0.040	0.048	<0.040	< 0.040
ortho-Xylene							<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	< 0.040	< 0.040	< 0.040	<0.040	< 0.040
Styrene	**5**	EH	50	EH	0.1	AL	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	< 0.030	< 0.030	< 0.030	<0.030	< 0.030
Methyl t-butyl ether (MTBE)	**8000**	HH	20000	HH			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	< 0.10	< 0.10	< 0.10	<0.10	< 0.10
meta- & para-Xylene							<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	< 0.040	< 0.040	0.048	<0.040	< 0.040
1,2,3-Trichlorobenzene	**100**	EH	10000	EH	0.05	AL	-	-	-	-	-	0.083[1]	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	< 0.025	-	-
1,2,4-Trichlorobenzene	**2**	EH	10	EH	0.05	AL	-	-	-	-	-	0.12[1]	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	< 0.025	-	-
Hexachlorobutadiene	**30**	HH	250	HH			-	-	-	-	-	< 0.20	-	-	-	-	-	<0.20	<0.20	<0.20	-	-	< 0.20	-	-
2-Butanone	**20000**	HH	150000	HH			-	-	-	-	-	-	-	-	-	-	-				-	-	-	-	-
2-Hexanone	**150**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-				-	-	-	-	-
4-Methyl-2-pentanone							-	-	-	-	-	-	-	-	-	-	-				-	-	-	-	-

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface
Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

1 = Qualifying ion outside of acceptance criteria. Results identified and potentially biased high.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Sample exceeds WLR standard
30	Sample exceeds CSR IL standard
23	Sample exceeds WLR standard

Table 14
Results of Soil Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_{PL} (< 3m) Stage10$_3$	Notes	BC CSR Standards for IL (> 3m) Stage 10$_3$	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-TP17-04	K19-TP17-05	K19-TP17-06	K19-TP17-07	K19-TP17-08	K19-TP17-09	K19-TP17-10	K19-TP17-10	K19-TP17-10	K19-TP17-11	K19-TP17-12	K19-TP17-13	K19-TP17-13	K19-TP17-14	K19-TP17-15	K19-TP17-15	K19-TP17-16	K19-TP17-16	K19-TP17-16
Sample Control Number							03344-06	03345-01	03345-10	03346-02	03346-05	03346-09	03346-12	03347-01	03347-05	03351-03	03351-08	03351-11	03352-02	03352-08	03353-01	03353-04	03347-07	03347-08	03347-11
Laboratory Report Number							B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B708210	B708210	B706358	B706358	B706358
Date Sampled							23-Jan-17	23-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	24-Jan-17	25-Jan-17	25-Jan-17	25-Jan-17	25-Jan-17	25-Jan-17	25-Jan-17
Depth of Sample (m bgs)							2.5	2.6	**4.2**	**3.4**	2.5	2.5	0.5	0.5	**3.8**	2.5	2.4	0.6	**3.4**	**3.4**	**3.5**	**4.9**	1.5	1.5	**4.2**
QA/QC													FDA	FD									FDA	FD	
APEC																									
Volatile Organic Compounds																									
Acetone	**30000**	HH	200000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	**200**	HH	550	HH			-	-	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	-	-	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	0.061	0.11	< 0.050
Bromomethane	**45**	HH	300	HH			-	-	< 0.30	-	< 0.30	< 0.30	< 0.30	< 0.30	-	-	< 0.30	-	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
Dibromoethane							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	**650**	HH	4,000	HH			-	-	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	-	-	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Carbon Tetrachloride	**5**	EH	50	EH	0.1	AL	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Chlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Chloroethane							-	-	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10	-	-	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chloroform	**5**	EH	50	EH	0.1	AL	-	-	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	-	-	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Chloromethane							-	-	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10	-	-	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dichloromethane	**5**	EH	50	EH	0.1	AL	-	-	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10	-	-	< 0.10	-	< 0.10	0.22	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibromochloromethane	**150**	HH	400	HH			-	-	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	-	-	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,2-Dibromoethane	**7**	HH	15	HH			-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,3-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,4-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Dichlorodifluoromethane	**6500**	HH	45,000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	**5**	EH	50	EH	0.1	AL	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichloroethane	**5**	EH	50	EH	0.1	AL	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1-Dichloroethylene	**5**	EH	50	EH	0.1	AL	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
cis-1,2-Dichloroethylene	**5**	EH	50	EH			-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
trans-1,2-Dichloroethylene	**5**	EH	50	EH			-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichloropropane	**5**	EH	50	EH	0.1	AL	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
cis-1,3-Dichloropropylene	**5**	EH	50	EH			-	-	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	-	-	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
trans-1,3-Dichloropropylene	**5**	EH	50	EH			-	-	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	-	-	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,1,1,2-Tetrachloroethane	**550**	HH	1500	HH			-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1,2,2-Tetrachloroethane	**70**	HH	150	HH	0.1	AL	-	-	0.11	-	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.025	-	0.17	< 0.025	< 0.025	< 0.025	8.4	12	< 0.025
Tetrachloroethylene	**2.5**	AW	2.5	AW	0.1	AL	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1,1-Trichloroethane	**5**	EH	50	EH	0.1	AL	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1,2-Trichloroethane	**5**	EH	50	EH	0.1	AL	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Trichloroethylene	**0.3**	AW	0.3	AW	0.01		-	-	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050	-	-	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Trichlorofluoromethane	**9000**	HH	70,000	HH			-	-	< 0.20	-	< 0.20	< 0.20	< 0.20	< 0.20	-	-	< 0.20	-	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Vinyl Chloride	**2**	HH	45	HH			-	-	< 0.060	-	< 0.060	< 0.060	< 0.060	< 0.060	-	-	< 0.060	-	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060
Benzene	**0.035**	DW	0.035	DW	0.0068		< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.35	**0.65**	< 0.0050	< 0.0050	< 0.0050	<0.0050	< 0.0050	< 0.0050	< 0.0050	0.0072	< 0.0050	0.0065	< 0.0050
Toluene	**0.5**	AW	0.5	AW	0.08		< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	**1.6**	**2.9**	0.047	< 0.020	< 0.020	<0.020	< 0.020	0.099	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Ethylbenzene	**15**	DW	15	DW	0.018		< 0.010	< 0.010	0.018	< 0.010	< 0.010	< 0.010	0.14	0.21	< 0.010	< 0.010	< 0.010	<0.010	< 0.010	< 0.010	0.012	0.037	0.27	0.43	0.021
Xylenes	**6.5**	DW	6.5	DW	2.4		< 0.040	< 0.040	0.062	< 0.040	< 0.040	< 0.040	1.7	2.5	< 0.040	< 0.040	< 0.040	<0.040	< 0.040	< 0.040	< 0.040	0.13	0.1	0.15	0.061
ortho-Xylene							< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	0.27	0.4	< 0.040	< 0.040	< 0.040	<0.040	< 0.040	< 0.040	< 0.040	0.042	< 0.040	< 0.040	< 0.040
Styrene	**5**	EH	50	EH	0.1	AL	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	<0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030
Methyl t-butyl ether (MTBE)	**8000**	HH	20000	HH			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	<0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
meta- & para-Xylene							< 0.040	< 0.040	0.062	< 0.040	< 0.040	< 0.040	1.4	2.1	< 0.040	< 0.040	< 0.040	<0.040	< 0.040	< 0.040	< 0.040	0.091	0.1	0.15	0.061
1,2,3-Trichlorobenzene	**100**	EH	10000	EH	0.05	AL	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	0.04	0.22	0.39	< 0.025
1,2,4-Trichlorobenzene	**2**	EH	10	EH	0.05	AL	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	0.22	0.22	< 0.025
Hexachlorobutadiene	**30**	HH	250	HH			-	-	< 0.20	-	< 0.20	< 0.20	< 0.20	< 0.20	-	-	< 0.20	-	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2-Butanone	**20000**	HH	150000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	**150**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

1 = Qualifying ion outside of acceptance criteria. Results identified and potentially biased high.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Sample exceeds WLR standard
30	Sample exceeds CSR IL standard
23	Sample exceeds WLR standard

Table 14
Results of Soil Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_{PL} (< 3m) Stage10$_3$	Notes	BC CSR Standards for IL (> 3m) Stage 10$_3$	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-TP17-17	K19-TP17-18	K19-TP17-18	K19-TP17-19	K19-TP17-20	K19-TP17-20	K19-TP17-21	K19-TP17-21	K19-TP17-21	K19-TP17-22	K19-TP17-22	K19-TP17-23	K19-TP17-24	K19-TP17-25	K19-TP17-26	K19-TP17-26	K19-TP17-26	K19-TP17-27	K19-TP17-27
Sample Control Number							03348-01	03349-01	03349-02	03349-07	03349-10	03350-01	03353-07	03353-08	03353-11	03354-04	03354-06	03354-11	03355-05	03355-10	03350-03	03350-08	03350-11	03356-03	03356-04
Laboratory Report Number							B706358	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210
Date Sampled							25-Jan-17	25-Jan-17	25-Jan-17	25-Jan-17	26-Jan-17	26-Jan-17	25-Jan-17	25-Jan-17	25-Jan-17	26-Jan-17	26-Jan-17	26-Jan-17	26-Jan-17	26-Jan-17	26-Jan-17	26-Jan-17	26-Jan-17	26-Jan-17	26-Jan-17
Depth of Sample (m bgs)							1.5	**3.4**	**4.0**	**4.0**	2.5	**4.1**	2.4	2.4	**4.6**	2.9	**5.1**	**3.2**	2.5	2.5	1.5	**4.4**	**6.2**	**3.5**	**4.6**
QA/QC													FDA	FD											
APEC																									
Volatile Organic Compounds																									
Acetone	**30000**	HH	200000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	**200**	HH	550	HH			< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	1.1	0.095	< 0.050	< 0.050
Bromomethane	**45**	HH	300	HH			< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	-	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	-	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
Dibromoethane			-				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	**650**	HH	4,000	HH			< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Carbon Tetrachloride	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Chlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	0.1	< 0.025	< 0.025	< 0.025
Chloroethane							< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chloroform	**5**	EH	50	EH	0.1	AL	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Chloromethane							< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dichloromethane	**5**	EH	50	EH	0.1	AL	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.26	< 0.10	-	< 0.10	2.5	0.26	< 0.10	0.38
Dibromochloromethane	**150**	HH	400	HH			< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,2-Dibromoethane	**7**	HH	15	HH			< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,3-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,4-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Dichlorodifluoromethane	**6500**	HH	45,000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	0.069	< 0.025	< 0.025	< 0.025
1,2-Dichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	1.6	0.36	< 0.025	< 0.025
1,1-Dichloroethylene	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
cis-1,2-Dichloroethylene	**5**	EH	50	EH			< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
trans-1,2-Dichloroethylene	**5**	EH	50	EH			< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichloropropane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	0.096	< 0.025	< 0.025	< 0.025
cis-1,3-Dichloropropylene	**5**	EH	50	EH			< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
trans-1,3-Dichloropropylene	**5**	EH	50	EH			< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,1,1,2-Tetrachloroethane	**550**	HH	1500	HH			< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1,2,2-Tetrachloroethane	**70**	HH	150	HH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Tetrachloroethylene	**2.5**	AW	2.5	AW	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1,1-Trichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1,2-Trichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	0.67	0.048	< 0.025	< 0.025
Trichloroethylene	**0.3**	AW	0.3	AW	0.01		< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	-	< 0.0050	0.016	< 0.0050	< 0.0050	< 0.0050
Trichlorofluoromethane	**9000**	HH	70,000	HH			< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	-	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	-	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Vinyl Chloride	**2**	HH	45	HH			< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	-	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	-	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060
Benzene	**0.035**	DW	0.035	DW	0.0068		< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.006	0.0078	< 0.0050	0.011	0.0052	0.0064	< 0.0050	< 0.0050	< 0.0050	20	1.9	< 0.0050	< 0.0050
Toluene	**0.5**	AW	0.5	AW	0.08		< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.024	0.055	< 0.020	0.028	< 0.020	3.7	1.0	< 0.020	< 0.020
Ethylbenzene	**15**	DW	15	DW	0.018		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.029	0.16	0.21	0.068	0.27	0.18	0.14	< 0.010	< 0.010	< 0.010	11	0.63	< 0.010	< 0.010
Xylenes	**6.5**	DW	6.5	DW	2.4		< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	0.08	0.18	0.27	0.28	0.34	0.56	0.33	< 0.040	< 0.040	< 0.040	18	2.3	< 0.040	< 0.040
ortho-Xylene							< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	0.092	< 0.040	0.14	0.056	< 0.040	< 0.040	< 0.040	1.5	0.42	< 0.040	< 0.040
Styrene	**5**	EH	50	EH	0.1	AL	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	0.093	< 0.030	< 0.030	< 0.030
Methyl t-butyl ether (MTBE)	**8000**	HH	20000	HH			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
meta- & para-Xylene							< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	0.080	0.18	0.27	0.19	0.34	0.42	0.27	< 0.040	< 0.040	< 0.040	16	1.8	< 0.040	< 0.040
1,2,3-Trichlorobenzene	**100**	EH	10000	EH	0.05	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	0.04	< 0.025	< 0.025	< 0.025
1,2,4-Trichlorobenzene	**2**	EH	10	EH	0.05	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	0.03	< 0.025	< 0.025	< 0.025
Hexachlorobutadiene	**30**	HH	250	HH			< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	-	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	-	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2-Butanone	**20000**	HH	150000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	**150**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface
Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

1 = Qualifying ion outside of acceptance criteria. Results identified and potentially biased high.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Sample exceeds WLR standard
30	Sample exceeds CSR IL standard
23	Sample exceeds WLR standard

Table 14
Results of Soil Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_R (< 3m) Stage10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-TP17-28	K19-TP17-28	K19-TP17-29	K19-TP17-29	K19-TP17-29	K19-TP17-30	K19-TP17-30	K19-TP17-31	K19-TP17-32	K19-TP17-33	K19-TP17-34	K19-TP17-35	K19-TP17-36	K19-TP17-36	K19-TP17-37	K19-TP17-38	K19-TP17-39	K19-TP17-39	K19-TP17-39
Sample Control Number							03356-09	03356-11	03357-01	03357-04	03357-07	03357-09	03357-12	03361-04	03361-08	03362-03	03362-07	03363-03	03358-05	03358-07	03359-01	03359-06	03364-11	03364-12	03365-03
Laboratory Report Number							B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210
Date Sampled							27-Jan-17	27-Jan-17	27-Jan-17	27-Jan-17	27-Jan-17	27-Jan-17	27-Jan-17	27-Jan-17	27-Jan-17	27-Jan-17	27-Jan-17	28-Jan-17	28-Jan-17	28-Jan-17	28-Jan-17	28-Jan-17	29-Jan-17	29-Jan-17	29-Jan-17
Depth of Sample (m bgs)							2.6	**4.3**	1.5	**3.5**	**5.8**	1.5	**3.2**	2.5	1.4	2.4	1.5	**3.4**	2.4	**4.1**	**4**	**3.5**	1.5 FDA	1.5 FD	**4.0**
QA/QC																									
APEC																									
Volatile Organic Compounds																									
Acetone	**30000**	HH	200000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	**200**	HH	550	HH			< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	-	-	< 0.050
Bromomethane	**45**	HH	300	HH			< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	-	< 0.30	-	-	< 0.30
Dibromoethane							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	**650**	HH	4,000	HH			< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	-	-	< 0.050
Carbon Tetrachloride	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-	< 0.025
Chlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-	< 0.025
Chloroethane							< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	-	-	< 0.10
Chloroform	**5**	EH	50	EH	0.1	AL	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	-	-	< 0.050
Chloromethane							< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	-	-	< 0.10
Dichloromethane	**5**	EH	50	EH	0.1	AL	< 0.10	< 0.10	< 0.10	0.22	< 0.10	0.15	< 0.10	0.31	< 0.10	0.19	< 0.10	< 0.10	< 0.10	< 0.10	-	0.19	-	-	< 0.10
Dibromochloromethane	**150**	HH	400	HH			< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	-	-	< 0.050
1,2-Dibromoethane	**7**	HH	15	HH			< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-	< 0.025
1,2-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-	< 0.025
1,3-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-	< 0.025
1,4-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-	< 0.025
Dichlorodifluoromethane	**6500**	HH	45,000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-	< 0.025
1,2-Dichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-	< 0.025
1,1-Dichloroethylene	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-	< 0.025
cis-1,2-Dichloroethylene	**5**	EH	50	EH			< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-	< 0.025
trans-1,2-Dichloroethylene	**5**	EH	50	EH			< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-	< 0.025
1,2-Dichloropropane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-	< 0.025
cis-1,3-Dichloropropylene	**5**	EH	50	EH			< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	-	-	< 0.050
trans-1,3-Dichloropropylene	**5**	EH	50	EH			< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	-	-	< 0.050
1,1,1,2-Tetrachloroethane	**550**	HH	1500	HH			< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-	< 0.025
1,1,2,2-Tetrachloroethane	**70**	HH	150	HH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-	< 0.025
Tetrachloroethylene	**2.5**	AW	2.5	AW	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-	< 0.025
1,1,1-Trichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-	< 0.025
1,1,2-Trichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	0.031	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-	< 0.025
Trichloroethylene	**0.3**	AW	0.3	AW	0.01		< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.016	-	< 0.0050	-	-	< 0.0050
Trichlorofluoromethane	**9000**	HH	70,000	HH			< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	-	< 0.20	-	-	< 0.20
Vinyl Chloride	**2**	HH	45	HH			< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	-	< 0.060	-	-	< 0.060
Benzene	**0.035**	DW	0.035	DW	0.0068		< 0.0050	< 0.0050	< 0.0050	0.0075	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Toluene	**0.5**	AW	0.5	AW	0.08		< 0.020	< 0.020	< 0.020	< 0.020	0.066	< 0.020	< 0.020	0.063	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.024	< 0.020	< 0.020	< 0.020
Ethylbenzene	**15**	DW	15	DW	0.018		< 0.010	< 0.010	< 0.010	0.089	0.21	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.042	0.014	< 0.010	< 0.010	< 0.010	0.048
Xylenes	**6.5**	DW	6.5	DW	2.4		< 0.040	< 0.040	< 0.040	0.088	0.91	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	0.19	0.043	< 0.040	< 0.040	< 0.040	0.21
ortho-Xylene							< 0.040	< 0.040	< 0.040	< 0.040	0.28	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	0.055	< 0.040	< 0.040	< 0.040	< 0.040	0.067
Styrene	**5**	EH	50	EH	0.1	AL	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030
Methyl t-butyl ether (MTBE)	**8000**	HH	20000	HH			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
meta- & para-Xylene							< 0.040	< 0.040	< 0.040	0.088	0.63	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	0.13	0.043	< 0.040	< 0.040	< 0.040	0.14
1,2,3-Trichlorobenzene	**100**	EH	10000	EH	0.05	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.037	-	< 0.025	-	-	< 0.025
1,2,4-Trichlorobenzene	**2**	EH	10	EH	0.05	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-	< 0.025
Hexachlorobutadiene	**30**	HH	250	HH			< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	-	< 0.20	-	-	< 0.20
2-Butanone	**20000**	HH	150000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	**150**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

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Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

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30	Sample exceeds CSR IL standard
23	Sample exceeds WLR standard

Table 14
Results of Soil Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_{PL} (< 3m) Stage10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-TP17-39	K19-TP17-40	K19-TP17-41	K19-TP17-42	K19-TP17-43	K19-TP17-44	K19-TP17-44	K19-TP17-44	K19-TP17-45	K19-TP17-46	K19-TP17-47	K19-TP17-48	K19-TP17-48	K19-TP17-49	K19-TP17-49	K19-TP17-50	K19-TP17-50	K19-MW17-01	K19-MW17-01
Sample Control Number							03365-04	03365-06	03363-10	03364-04	03364-06	03359-11	03365-11	03365-12	06685-04	06685-11	06686-02	06686-06	06686-12	06688-03	06688-06	06688-09	06688-12	03360-02	03360-04
Laboratory Report Number							B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132
Date Sampled							29-Jan-17	29-Jan-17	28-Jan-17	28-Jan-17	28-Jan-17	29-Jan-17	29-Jan-17	29-Jan-17	30-Jan-17	30-Jan-17	30-Jan-17	30-Jan-17	30-Jan-17	31-Jan-17	31-Jan-17	31-Jan-17	31-Jan-17	30-Jan-17	30-Jan-17
Depth of Sample (m bgs)							**5.1**	1.5	**4.3**	**4.3**	1.4	**4.2**	1.7	1.7	2.5	**3.4**	1.6	0.7	**4.9**	2.4	**4.1**	2.4	**5.1**	1.5	**3.5**
QA/QC													FDA	FD											FDA
APEC																									
Volatile Organic Compounds																									
Acetone	**30000**	HH	200000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	**200**	HH	550	HH			0.082	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	-	< 0.050	< 0.050	0.095	0.66
Bromomethane	**45**	HH	300	HH			< 0.30	< 0.30	-	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	-	< 0.30	-	< 0.30	< 0.30	< 0.30	< 0.30
Dibromoethane							-	-	-	-	-	-	-	-											
Bromoform	**650**	HH	4,000	HH			< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050
Carbon Tetrachloride	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025
Chlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	< 0.025	< 0.025	< 0.025	0.066
Chloroethane							< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10
Chloroform	**5**	EH	50	EH	0.1	AL	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050
Chloromethane							< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10
Dichloromethane	**5**	EH	50	EH	0.1	AL	< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	-	< 0.10	< 0.10	< 0.10	0.66
Dibromochloromethane	**150**	HH	400	HH			< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050
1,2-Dibromoethane	**7**	HH	15	HH			< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025
1,3-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025
1,4-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025
Dichlorodifluoromethane	**6500**	HH	45,000	HH			-	-	-	-	-	-	-	-											
1,1-Dichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	< 0.025	< 0.025	0.078	0.094
1,1-Dichloroethylene	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025
cis-1,2-Dichloroethylene	**5**	EH	50	EH			< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025
trans-1,2-Dichloroethylene	**5**	EH	50	EH			< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichloropropane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025
cis-1,3-Dichloropropylene	**5**	EH	50	EH			< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050
trans-1,3-Dichloropropylene	**5**	EH	50	EH			< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050
1,1,1,2-Tetrachloroethane	**550**	HH	1500	HH			< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025
1,1,2,2-Tetrachloroethane	**70**	HH	150	HH	0.1	AL	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025
Tetrachloroethylene	**2.5**	AW	2.5	AW	0.1	AL	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025
1,1,1-Trichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025
1,1,2-Trichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	< 0.025	< 0.025	0.07	0.45
Trichloroethylene	**0.3**	AW	0.3	AW	0.01		< 0.0050	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	-	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Trichlorofluoromethane	**9000**	HH	70,000	HH			< 0.20	< 0.20	-	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	-	< 0.20	-	< 0.20	< 0.20	< 0.20	< 0.20
Vinyl Chloride	**2**	HH	45	HH			< 0.060	< 0.060	-	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	-	< 0.060	-	< 0.060	< 0.060	< 0.060	< 0.060
Benzene	**0.035**	DW	0.035	DW	0.0068		0.0051	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.0081	0.0097	< 0.0050	< 0.0050	0.0061	0.033	**0.85**	1.9
Toluene	**0.5**	AW	0.5	AW	0.08		0.023	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.24	< 0.020	< 0.020	**0.62**	0.31	< 0.020	0.024	0.21	3.8	0.054	0.35
Ethylbenzene	**15**	DW	15	DW	0.018		0.098	< 0.010	0.04	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.023	0.081	< 0.010	0.012	0.011	4.3
Xylenes	**6.5**	DW	6.5	DW	2.4		0.44	< 0.040	0.17	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	0.34	< 0.040	< 0.040	0.054	5
ortho-Xylene							0.12	< 0.040	0.049	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	0.11	< 0.040	< 0.040	< 0.040	0.11
Styrene	**5**	EH	50	EH	0.1	AL	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030
Methyl t-butyl ether (MTBE)	**8000**	HH	20000	HH			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
meta- & para-Xylene							0.32	< 0.040	0.12	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	0.23	< 0.040	< 0.040	0.054	4.9
1,2,3-Trichlorobenzene	**100**	EH	10000	EH	0.05	AL	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025
1,2,4-Trichlorobenzene	**2**	EH	10	EH	0.05	AL	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025
Hexachlorobutadiene	**30**	HH	250	HH			< 0.20	< 0.20	-	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	-	< 0.20	-	< 0.20	< 0.20	< 0.20	< 0.20
2-Butanone	**20000**	HH	150000	HH			-	-	-	-	-	-	-	-											
2-Hexanone	**150**	HH	1000	HH			-	-	-	-	-	-	-	-											
4-Methyl-2-pentanone							-	-	-	-	-	-	-	-											

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface
Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

1 = Qualifying ion outside of acceptance criteria. Results identified and potentially biased high.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Sample exceeds WLR standard
30	Sample exceeds CSR IL standard
23	Sample exceeds WLR standard

Table 14
Results of Soil Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_R (< 3m) Stage10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-MW17-01	K19-MW17-01	K19-MW17-01	K19-MW17-02	K19-MW17-02	K19-MW17-02	K19-BH17-03	K19-MW17-04	K19-MW17-04	K19-MW17-05	K19-MW17-05	K19-MW17-05	K19-MW17-06	K19-MW17-06	K19-MW17-06	K19-MW17-07	K19-MW17-07	K19-MW17-07	K19-BH17-08
Sample Control Number							03360-05	03360-08	03360-10	03360-12	06696-01	06696-05	06696-12	06697-03	06697-06	06697-11	06697-12	06698-01	06698-09	06698-10	06698-11	06699-08	06699-10	06699-12	06700-07
Laboratory Report Number							B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078
Date Sampled							30-Jan-17	30-Jan-17	30-Jan-17	30-Jan-17	30-Jan-17	30-Jan-17	31-Jan-17	31-Jan-17	1-Feb-17	1-Feb-17	1-Feb-17	1-Feb-17	2-Feb-17	2-Feb-17	2-Feb-17	3-Feb-17	3-Feb-17	3-Feb-17	4-Feb-17
Depth of Sample (m bgs)							**3.5**	**6.5**	**8.6**	1.5	2.5	**5.5**	**4.0**	1.4	**3.3**	1.4	2.5	**3.5**	2.5	**3.5**	**3.5**	1.5	2.5	**4.7**	2.5
QA/QC							FD													FDA	FD				
APEC																									
Volatile Organic Compounds																									
Acetone	**30000**	HH	200000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	**200**	HH	550	HH			0.6	0.056	< 0.050	< 0.050	< 0.050	< 0.050	0.13	< 0.050	0.061	< 0.050	< 0.050	< 0.050	< 0.050	0.058	< 0.050	< 0.050	< 0.050	0.087	< 0.050
Bromomethane	**45**	HH	300	HH			< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
Dibromoethane																									
Bromoform	**650**	HH	4,000	HH			< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Carbon Tetrachloride	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Chlorobenzene	**1**	EH	10	EH	0.1	AL	0.063	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Chloroethane							< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chloroform	**5**	EH	50	EH	0.1	AL	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Chloromethane							< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dichloromethane	**5**	EH	50	EH	0.1	AL	0.85	< 0.10	< 0.10	< 0.10	< 0.10	0.11	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibromochloromethane	**150**	HH	400	HH			< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,2-Dibromoethane	**7**	HH	15	HH			< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,3-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,4-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Dichlorodifluoromethane	**6500**	HH	45,000	HH																					
1,1-Dichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichloroethane	**5**	EH	50	EH	0.1	AL	0.13	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1-Dichloroethylene	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
cis-1,2-Dichloroethylene	**5**	EH	50	EH			< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
trans-1,2-Dichloroethylene	**5**	EH	50	EH			< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-Dichloropropane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
cis-1,3-Dichloropropylene	**5**	EH	50	EH			< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
trans-1,3-Dichloropropylene	**5**	EH	50	EH			< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,1,1,2-Tetrachloroethane	**550**	HH	1500	HH			< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1,2,2-Tetrachloroethane	**70**	HH	150	HH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Tetrachloroethylene	**2.5**	AW	2.5	AW	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1,1-Trichloroethane	**5**	EH	50	EH	0.1	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1,2-Trichloroethane	**5**	EH	50	EH	0.1	AL	0.38	< 0.025	< 0.025	< 0.025	0.032	< 0.025	0.044	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.031	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Trichloroethylene	**0.3**	AW	0.3	AW	0.01		< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Trichlorofluoromethane	**9000**	HH	70,000	HH			< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Vinyl Chloride	**2**	HH	45	HH			< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060
Benzene	**0.035**	DW	0.035	DW	0.0068		2.7	0.075	0.015	**0.035**	**0.23**	0.22	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.012	< 0.0050	< 0.0050
Toluene	**0.5**	AW	0.5	AW	0.08		0.64	0.025	0.71	0.16	0.032	0.21	0.038	< 0.020	0.27	< 0.020	0.39	0.19	< 0.020	0.3	0.13	< 0.020	0.023	0.18	< 0.020
Ethylbenzene	**15**	DW	15	DW	0.018		5.1	0.041	0.014	0.21	0.36	0.097	0.33	0.013	< 0.010	< 0.010	0.015	0.11	< 0.010	0.018	0.013	< 0.010	0.29	0.25	< 0.010
Xylenes	**6.5**	DW	6.5	DW	2.4		6.2	0.057	< 0.040	< 0.040	0.096	0.41	1.5	< 0.040	< 0.040	< 0.040	< 0.040	0.5	< 0.040	0.1	0.044	< 0.040	0.087	1.1	< 0.040
ortho-Xylene							0.12	< 0.040	< 0.040	< 0.040	< 0.040	0.11	0.49	< 0.040	< 0.040	< 0.040	< 0.040	0.15	< 0.040	0.041	< 0.040	< 0.040	< 0.040	0.34	< 0.040
Styrene	**5**	EH	50	EH	0.1	AL	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030
Methyl t-butyl ether (MTBE)	**8000**	HH	20000	HH			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
meta- & para-Xylene							6.1	0.057	< 0.040	< 0.040	0.096	0.3	1.1	< 0.040	< 0.040	< 0.040	< 0.040	0.35	< 0.040	0.062	0.044	< 0.040	0.087	0.71	< 0.040
1,2,3-Trichlorobenzene	**100**	EH	10000	EH	0.05	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.11	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2,4-Trichlorobenzene	**2**	EH	10	EH	0.05	AL	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.091	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Hexachlorobutadiene	**30**	HH	250	HH			< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2-Butanone	**20000**	HH	150000	HH																					
2-Hexanone	**150**	HH	1000	HH																					
4-Methyl-2-pentanone																									

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface
Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

1 = Qualifying ion outside of acceptance criteria. Results identified and potentially biased high.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Sample exceeds WLR standard
30	Sample exceeds CSR IL standard
23	Sample exceeds WLR standard

Table 14
Results of Soil Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location								K19-BH17-08	K19-BH17-09	K19-BH17-09	K19-MW17-10	K19-MW17-11	K19-MW17-12	K19-MW17-12	K19-MW17-13	K19-MW17-13	K19-BH17-14	K19-BH17-14	K19-BH17-14	K19-BH17-15	K19-BH17-16	K19-HA17-01	K19-HA17-06	K19-HA17-07	K19-HA17-08
Sample Control Number								06700-10	06701-01	06701-02	06701-08	06702-05	06702-10	06703-01	06703-10	06703-12	06704-06	06704-07	06704-08	06705-03	06705-09	03811-04	03845-03	03606-01	03606-02
Laboratory Report Number								B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710365	B710365	B710365	B710365	B710365	17N240971	17N243343	17N244304	17N244304
Date Sampled								4-Feb-17	4-Feb-17	4-Feb-17	4-Feb-17	5-Feb-17	5-Feb-17	5-Feb-17	6-Feb-17	6-Feb-17	7-Feb-17	7-Feb-17	7-Feb-17	7-Feb-17	7-Feb-17	17-Jul-17	23-Jul-17	29-Jul-17	30-Jul-17
Depth of Sample (m bgs)								**5.2**	2.5	2.5	2.5	**3.5**	1.4	**3.5**	**3.5**	**5.5**	2.5	2.5	**3.5**	**3.5**	**3.5**	0.4-0.6	1.4-1.5	0.35-0.5	0.3-0.45
QA/QC									FDA	FD							FD	FDA							
APEC																						1a	10a	background	10a
Volatile Organic Compounds																									
Acetone	**30000**	HH	200000	HH				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5	< 0.5
Bromodichloromethane	**200**	HH	550	HH				0.1	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	0.1	0.084	0.088	< 0.050	< 0.050	< 0.050	0.081	0.079	-	< 0.05	< 0.05	< 0.05
Bromomethane	**45**	HH	300	HH				< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	-	< 0.05	< 0.05	< 0.05
Dibromoethane																									
Bromoform	**650**	HH	4,000	HH				< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.05	< 0.05	< 0.05
Carbon Tetrachloride	**5**	EH	50	EH	0.1	AL		< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.02	< 0.02	< 0.02
Chlorobenzene	**1**	EH	10	EH	0.1	AL		< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.05	< 0.05	< 0.05
Chloroethane								< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.05	< 0.05	< 0.05
Chloroform	**5**	EH	50	EH	0.1	AL		< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.05	< 0.05	< 0.05
Chloromethane								< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.05	< 0.05	< 0.05
Dichloromethane	**5**	EH	50	EH	0.1	AL		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.11	< 0.10	0.18	< 0.10	< 0.10	-	< 0.05	< 0.05	< 0.05
Dibromochloromethane	**150**	HH	400	HH				< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.05	< 0.05	< 0.05
1,2-Dibromoethane	**7**	HH	15	HH				< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	**1**	EH	10	EH	0.1	AL		< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	**1**	EH	10	EH	0.1	AL		< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	**1**	EH	10	EH	0.1	AL		< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.05	< 0.05	< 0.05
Dichlorodifluoromethane	**6500**	HH	45,000	HH																					
1,1-Dichloroethane	**5**	EH	50	EH	0.1	AL		< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.05	< 0.05	< 0.05
1,2-Dichloroethane	**5**	EH	50	EH	0.1	AL		< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.045	0.048	< 0.025	< 0.025	< 0.025	-	< 0.05	< 0.05	< 0.05
1,1-Dichloroethylene	**5**	EH	50	EH	0.1	AL		< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.05	< 0.05	< 0.05
cis-1,2-Dichloroethylene	**5**	EH	50	EH				< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.05	< 0.05	< 0.05
trans-1,2-Dichloroethylene	**5**	EH	50	EH				< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.05	< 0.05	< 0.05
1,2-Dichloropropane	**5**	EH	50	EH	0.1	AL		< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.05	< 0.05	< 0.05
cis-1,3-Dichloropropylene	**5**	EH	50	EH				< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.05	< 0.05	< 0.05
trans-1,3-Dichloropropylene	**5**	EH	50	EH				< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.05	< 0.05	< 0.05
1,1,1,2-Tetrachloroethane	**550**	HH	1500	HH				< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.05	< 0.05	< 0.05
1,1,2,2-Tetrachloroethane	**70**	HH	150	HH	0.1	AL		< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.05	< 0.05	< 0.05
Tetrachloroethylene	**2.5**	AW	2.5	AW	0.1	AL		< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.05	< 0.05	< 0.05
1,1,1-Trichloroethane	**5**	EH	50	EH	0.1	AL		< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.05	< 0.05	< 0.05
1,1,2-Trichloroethane	**5**	EH	50	EH	0.1	AL		< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.05	< 0.05	< 0.05
Trichloroethylene	**0.3**	AW	0.3	AW	0.01			< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	-	< 0.01	< 0.01	< 0.01
Trichlorofluoromethane	**9000**	HH	70,000	HH				< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	-	< 0.05	< 0.05	< 0.05
Vinyl Chloride	**2**	HH	45	HH				< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	< 0.060	-	< 0.05	< 0.05	< 0.05
Benzene	**0.035**	DW	0.035	DW	0.0068			< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	**0.069**	**0.06**	0.25	0.0055	< 0.0050	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*
Toluene	**0.5**	AW	0.5	AW	0.08			0.099	< 0.020	0.15	< 0.020	0.06	< 0.020	0.027	0.021	0.098	0.16	< 0.020	0.26	0.031	0.034	< 0.05	< 0.05	< 0.05	< 0.05
Ethylbenzene	**15**	DW	15	DW	0.018			0.38	0.11	0.052	< 0.010	< 0.010	< 0.010	0.093	0.055	0.3	< 0.010	< 0.010	0.02	0.12	0.077	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*
Xylenes	**6.5**	DW	6.5	DW	2.4			1.6	0.21	0.083	< 0.040	< 0.040	< 0.040	0.44	0.27	1.3	< 0.040	< 0.040	0.045	0.59	0.36	< 0.1	< 0.2	< 0.2	< 0.2
ortho-Xylene								0.5	0.057	< 0.040	< 0.040	< 0.040	< 0.040	0.14	0.087	0.4	< 0.040	< 0.040	< 0.040	0.2	0.11	< 0.05	< 0.05	< 0.05	< 0.05
Styrene	**5**	EH	50	EH	0.1	AL		< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.05	< 0.05	< 0.05	< 0.05
Methyl t-butyl ether (MTBE)	**8000**	HH	20000	HH				< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.1	< 0.1	< 0.1	< 0.1
meta- & para-Xylene								1.1	0.15	0.083	< 0.040	< 0.040	< 0.040	0.31	0.18	0.86	< 0.040	< 0.040	0.045	0.4	0.26	0.05	< 0.05	< 0.05	< 0.05
1,2,3-Trichlorobenzene	**100**	EH	10000	EH	0.05	AL		< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	-	-	-
1,2,4-Trichlorobenzene	**2**	EH	10	EH	0.05	AL		< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	**30**	HH	250	HH				< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	-	-	-	-
2-Butanone	**20000**	HH	150000	HH																		-	< 0.5	< 0.5	< 0.5
2-Hexanone	**150**	HH	1000	HH																		-	-	-	-
4-Methyl-2-pentanone																						-	< 0.5	< 0.5	< 0.5

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

1 = Qualifying ion outside of acceptance criteria. Results identified and potentially biased high.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Sample exceeds WLR standard
30	Sample exceeds CSR IL standard
23	Sample exceeds WLR standard

Table 14
Results of Soil Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_R (< 3m) Stage 10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-HA17-09	K19-HD17-02	K19-HD17-03	K19-HD17-07	K19-MW17-17	K19-MW17-18	K19-MW17-18	K19-MW17-18	K19-MW17-19	K19-MW17-19	K19-MW17-19-SA6	K19-MW17-20	K19-MW17-20	K19-MW17-20	K19-MW17-21	K19-MW17-21	K19-MW17-22
Sample Control Number							04263-01	03776-02	03776-03	03776-07	03831-05	03831-10	03832-02	03832-04	03832-06	03832-08	03832-11	03833-03	03833-05	03833-06	03833-10	03834-02	03834-06
Laboratory Report Number							17N271535	17N238668	17N238668	17N238668	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036
Date Sampled							11-Oct-17	16-Jul-17	16-Jul-17	16-Jul-17	18-Jul-17	19-Jul-17	19-Jul-17	19-Jul-17	19-Jul-17	19-Jul-17	19-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17
Depth of Sample (m bgs)							0.05 - 0.45	0.4	0.35	0.3	5.2-5.8 m	**4.5-4.8**	**7.5-8.5**	**12-13**	1.8-2.1	**5-6**	**7-8**	**3-3.5**	**5.8-6.8**	**5.8-6.8**	**4.5-5**	**9-10**	**4.5-5**
QA/QC																			FDA	FD			
APEC							9	1d	1d	6	26	24	24	24	27	27	27	6	6	6	21	21	25
Volatile Organic Compounds																							
Acetone	**30000**	HH	200000	HH			< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	-	-	< 0.5	-	-	< 0.5	-	< 0.5	-	< 0.5
Bromodichloromethane	**200**	HH	550	HH			< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
Bromomethane	**45**	HH	300	HH			< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
Dibromoethane																							
Bromoform	**650**	HH	4,000	HH			< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
Carbon Tetrachloride	**5**	EH	50	EH	0.1	AL	< 0.02	< 0.02	< 0.02	-	< 0.02	< 0.02	< 0.02	-	-	< 0.02	-	-	< 0.02	-	< 0.02	-	< 0.02
Chlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
Chloroethane							< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
Chloroform	**5**	EH	50	EH	0.1	AL	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
Chloromethane							< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
Dichloromethane	**5**	EH	50	EH	0.1	AL	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
Dibromochloromethane	**150**	HH	400	HH			< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
1,2-Dibromoethane	**7**	HH	15	HH			< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
1,2-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
1,3-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
1,4-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
Dichlorodifluoromethane	**6500**	HH	45,000	HH																			
1,1-Dichloroethane	**5**	EH	50	EH	0.1	AL	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
1,2-Dichloroethane	**5**	EH	50	EH	0.1	AL	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
1,1-Dichloroethylene	**5**	EH	50	EH	0.1	AL	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
cis-1,2-Dichloroethylene	**5**	EH	50	EH			< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
trans-1,2-Dichloroethylene	**5**	EH	50	EH			< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
1,2-Dichloropropane	**5**	EH	50	EH	0.1	AL	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
cis-1,3-Dichloropropylene	**5**	EH	50	EH			< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
trans-1,3-Dichloropropylene	**5**	EH	50	EH			< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
1,1,1,2-Tetrachloroethane	**550**	HH	1500	HH			< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
1,1,2,2-Tetrachloroethane	**70**	HH	150	HH	0.1	AL	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
Tetrachloroethylene	**2.5**	AW	2.5	AW	0.1	AL	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
1,1,1-Trichloroethane	**5**	EH	50	EH	0.1	AL	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
1,1,2-Trichloroethane	**5**	EH	50	EH	0.1	AL	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
Trichloroethylene	**0.3**	AW	0.3	AW	0.01		< 0.01	< 0.01	< 0.01	-	< 0.01	< 0.01	< 0.01	-	-	< 0.01	-	-	< 0.01	-	< 0.01	-	< 0.01
Trichlorofluoromethane	**9000**	HH	70,000	HH			< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
Vinyl Chloride	**2**	HH	45	HH			< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
Benzene	**0.035**	DW	0.035	DW	0.0068		*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	< 0.02	*< 0.02*	*< 0.02*	*< 0.02*	-	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*
Toluene	**0.5**	AW	0.5	AW	0.08		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	0.11	0.09	0.06	0.13	0.2
Ethylbenzene	**15**	DW	15	DW	0.018		*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	< 0.05	0.1	*< 0.05*	*< 0.05*	-	*< 0.05*	0.3	*< 0.05*	0.22	0.23	0.23	0.44	0.38
Xylenes	**6.5**	DW	6.5	DW	2.4		< 0.2	< 0.2	< 0.2	< 0.1	< 0.2	0.5	< 0.2	< 0.1	-	< 0.2	2.2	< 0.1	1.0	1.0	1.0	1.9	1.6
ortho-Xylene							< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.15	< 0.05	< 0.05	-	0.07	0.81	< 0.05	0.31	0.33	0.31	0.6	0.5
Styrene	**5**	EH	50	EH	0.1	AL	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methyl t-butyl ether (MTBE)	**8000**	HH	20000	HH			< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
meta- & para-Xylene							< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.33	< 0.05	< 0.05	-	0.07	1.36	< 0.05	0.66	0.71	0.66	1.3	1.05
1,2,3-Trichlorobenzene	**100**	EH	10000	EH	0.05	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	**2**	EH	10	EH	0.05	AL	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05
Hexachlorobutadiene	**30**	HH	250	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	**20000**	HH	150000	HH			< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	-	-	< 0.5	-	-	< 0.5	-	< 0.5	-	< 0.5
2-Hexanone	**150**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone							< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	-	-	< 0.5	-	-	< 0.5	-	< 0.5	-	< 0.5

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface
Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

1 = Qualifying ion outside of acceptance criteria. Results identified and potentially biased high.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Sample exceeds WLR standard
30	Sample exceeds CSR IL standard
23	Sample exceeds WLR standard

Table 14
Results of Soil Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_R (< 3m) Stage10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-MW17-22	K19-MW17-23	K19-MW17-23-SA6	K19-MW17-24	K19-MW17-25	K19-MW17-25	K19-MW17-26	K19-MW17-26	K19-MW17-26	K19-MW17-26	K19-MW17-27	K19-MW17-27	K19-MW17-28	K19-MW17-28-SA6	K19-MW17-29	K19-MW17-29	K19-MW17-29
Sample Control Number							03834-10	03835-01	03835-04	03835-12	03836-03	03836-05	03836-08	03836-09	03836-12	03837-01	03837-06	03837-08	03838-01	03838-03	03838-06	03838-07	03838-08
Laboratory Report Number							17N242036	17N242036	17N242036	17N242036	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343
Date Sampled							21-Jul-17	21-Jul-17	21-Jul-17	22-Jul-17	22-Jul-17	22-Jul-17	22-Jul-17	22-Jul-17	22-Jul-17	22-Jul-17	23-Jul-17	23-Jul-17	23-Jul-17	23-Jul-17	24-Jul-17	24-Jul-17	24-Jul-17
Depth of Sample (m bgs)							**4.5-5**	**3-3.3**	**8-8.5**	**4.7-5.2**	**3-3.5**	**6-6.5**	**3.5-4**	**3.5-4**	**8-8.8**	**11-11.8**	**6-6.5**	**8-8.75**	**5-5.5**	**8-8.5**	2.5-2.8	**3.4-3.7**	**3.4-3.7**
QA/QC													FDA	FD								FDA	FD
APEC							25	18	18	17	16	16	19	19	19	19	20	20	4	4	1b	1b	1b
Volatile Organic Compounds																							
Acetone	**30000**	HH	200000	HH			< 0.5	< 0.5	-	< 0.5	-	< 0.5	< 0.5	-	-	-	< 0.5	< 0.5	-	< 0.5	-	< 0.5	< 0.5
Bromodichloromethane	**200**	HH	550	HH			< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
Bromomethane	**45**	HH	300	HH			< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
Dibromoethane																							
Bromoform	**650**	HH	4,000	HH			< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
Carbon Tetrachloride	**5**	EH	50	EH	0.1	AL	< 0.02	< 0.02	-	< 0.02	-	< 0.02	< 0.02	-	-	-	< 0.02	< 0.02	-	< 0.02	-	< 0.02	< 0.02
Chlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
Chloroethane							< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
Chloroform	**5**	EH	50	EH	0.1	AL	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
Chloromethane							< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
Dichloromethane	**5**	EH	50	EH	0.1	AL	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
Dibromochloromethane	**150**	HH	400	HH			< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
1,2-Dibromoethane	**7**	HH	15	HH			< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
1,2-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
1,3-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
1,4-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
Dichlorodifluoromethane	**6500**	HH	45,000	HH																			
1,1-Dichloroethane	**5**	EH	50	EH	0.1	AL	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
1,2-Dichloroethane	**5**	EH	50	EH	0.1	AL	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
1,1-Dichloroethylene	**5**	EH	50	EH	0.1	AL	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
cis-1,2-Dichloroethylene	**5**	EH	50	EH			< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
trans-1,2-Dichloroethylene	**5**	EH	50	EH			< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
1,2-Dichloropropane	**5**	EH	50	EH	0.1	AL	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
cis-1,3-Dichloropropylene	**5**	EH	50	EH			< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
trans-1,3-Dichloropropylene	**5**	EH	50	EH			< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
1,1,1,2-Tetrachloroethane	**550**	HH	1500	HH			< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
1,1,2,2-Tetrachloroethane	**70**	HH	150	HH	0.1	AL	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
Tetrachloroethylene	**2.5**	AW	2.5	AW	0.1	AL	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
1,1,1-Trichloroethane	**5**	EH	50	EH	0.1	AL	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
1,1,2-Trichloroethane	**5**	EH	50	EH	0.1	AL	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
Trichloroethylene	**0.3**	AW	0.3	AW	0.01		< 0.01	< 0.01	-	< 0.01	-	< 0.01	< 0.01	-	-	-	< 0.01	< 0.01	-	< 0.01	-	< 0.01	< 0.01
Trichlorofluoromethane	**9000**	HH	70,000	HH			< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
Vinyl Chloride	**2**	HH	45	HH			< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
Benzene	**0.035**	DW	0.035	DW	0.0068		*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	**0.04**	0.05	0.08
Toluene	**0.5**	AW	0.5	AW	0.08		0.08	< 0.05	0.22	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	1.35	0.74	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Ethylbenzene	**15**	DW	15	DW	0.018		0.29	0.14	0.27	0.17	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	0.81	0.87	0.13	0.25	*< 0.05*	*< 0.05*	*< 0.05*	0.08	0.14
Xylenes	**6.5**	DW	6.5	DW	2.4		1.3	0.6	1.1	0.8	< 0.1	< 0.2	< 0.2	0.2	3.2	3.7	0.5	1.1	< 0.1	< 0.2	< 0.1	< 0.2	0.3
ortho-Xylene							0.41	0.19	0.38	0.26	< 0.05	< 0.05	< 0.05	0.05	1.09	1.27	0.17	0.35	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Styrene	**5**	EH	50	EH	0.1	AL	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methyl t-butyl ether (MTBE)	**8000**	HH	20000	HH			< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
meta- & para-Xylene							0.93	0.44	0.76	0.57	< 0.05	< 0.05	< 0.05	0.1	2.09	2.43	0.36	0.79	< 0.05	< 0.05	< 0.05	0.15	0.26
1,2,3-Trichlorobenzene	**100**	EH	10000	EH	0.05	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	**2**	EH	10	EH	0.05	AL	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05
Hexachlorobutadiene	**30**	HH	250	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	**20000**	HH	150000	HH			< 0.5	< 0.5	-	< 0.5	-	< 0.5	< 0.5	-	-	-	< 0.5	< 0.5	-	< 0.5	-	< 0.5	< 0.5
2-Hexanone	**150**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone							< 0.5	< 0.5	-	< 0.5	-	< 0.5	< 0.5	-	-	-	< 0.5	< 0.5	-	< 0.5	-	< 0.5	< 0.5

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

1 = Qualifying ion outside of acceptance criteria. Results identified and potentially biased high.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Sample exceeds WLR standard
30	Sample exceeds CSR IL standard
23	Sample exceeds WLR standard

Table 14
Results of Soil Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_R (< 3m) Stage10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-MW17-29-SA6	K19-MW17-30	K19-MW17-30-SA6	K19-MW17-31	K19-MW17-31	K19-MW17-31	K19-MW17-32	K19-MW17-32	K19-MW17-33	K19-MW17-34	K19-MW17-34	K19-MW17-34	K19-MW17-35	K19-MW17-35	K19-MW17-35	K19-MW17-35-SA6	K19-MW17-35-SA6
Sample Control Number							03838-10	03839-01	03839-04	03839-07	03839-09	03839-10	03846-01	03846-02	03846-06	03846-09	03846-10	03846-12	03847-02	03847-03	03847-05	03847-07	03847-08
Laboratory Report Number							17N243343	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826
Date Sampled							24-Jul-17	25-Jul-17	25-Jul-17	26-Jul-17	26-Jul-17	26-Jul-17	26-Jul-17	26-Jul-17	26-Jul-17	27-Jul-17	27-Jul-17	27-Jul-17	27-Jul-17	27-Jul-17	27-Jul-17	27-Jul-17	27-Jul-17
Depth of Sample (m bgs)							**5.3-5.5**	**3.5-3.9**	**8-8.7**	**3.5-4**	**6.4-6.8**	**6.4-6.8**	**3.5-4**	**5-5.5**	**5-5.5**	**3.5-4**	**3.5-4**	**6-6.5**	1-1.5	1-1.5	2.5-3	**4-4.5**	**4-4.5**
QA/QC											FDA	FD				FDA	FD		FDA	FD		FDA	FD
APEC							1b	12	12	11	11	11	1d	1d	14	15	15	15	1b	1b	1b	1b	1b
Volatile Organic Compounds																							
Acetone	**30000**	HH	200000	HH			-	< 0.5	-	< 0.5	-	-	< 0.5	-	< 0.5	< 0.5	-	-	< 0.5	-	-	< 0.5	< 0.5
Bromodichloromethane	**200**	HH	550	HH			-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
Bromomethane	**45**	HH	300	HH			-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
Dibromoethane																							
Bromoform	**650**	HH	4,000	HH			-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
Carbon Tetrachloride	**5**	EH	50	EH	0.1	AL	-	< 0.02	-	< 0.02	-	-	< 0.02	-	< 0.02	< 0.02	-	-	< 0.02	-	-	< 0.02	< 0.02
Chlorobenzene	**1**	EH	10	EH	0.1	AL	-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
Chloroethane							-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
Chloroform	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
Chloromethane							-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
Dichloromethane	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
Dibromochloromethane	**150**	HH	400	HH			-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
1,2-Dibromoethane	**7**	HH	15	HH			-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
1,2-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
1,3-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
1,4-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
Dichlorodifluoromethane	**6500**	HH	45,000	HH																			
1,1-Dichloroethane	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
1,2-Dichloroethane	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
1,1-Dichloroethylene	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
cis-1,2-Dichloroethylene	**5**	EH	50	EH			-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
trans-1,2-Dichloroethylene	**5**	EH	50	EH			-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
1,2-Dichloropropane	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
cis-1,3-Dichloropropylene	**5**	EH	50	EH			-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
trans-1,3-Dichloropropylene	**5**	EH	50	EH			-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
1,1,1,2-Tetrachloroethane	**550**	HH	1500	HH			-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
1,1,2,2-Tetrachloroethane	**70**	HH	150	HH	0.1	AL	-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
Tetrachloroethylene	**2.5**	AW	2.5	AW	0.1	AL	-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
1,1,1-Trichloroethane	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
1,1,2-Trichloroethane	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
Trichloroethylene	**0.3**	AW	0.3	AW	0.01		-	< 0.01	-	< 0.01	-	-	< 0.01	-	< 0.01	< 0.01	-	-	< 0.01	-	-	< 0.01	< 0.01
Trichlorofluoromethane	**9000**	HH	70,000	HH			-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
Vinyl Chloride	**2**	HH	45	HH			-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
Benzene	**0.035**	DW	0.035	DW	0.0068		*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	0.3	0.39
Toluene	**0.5**	AW	0.5	AW	0.08		< 0.05	< 0.05	0.34	< 0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.06	0.08
Ethylbenzene	**15**	DW	15	DW	0.018		*< 0.05*	*< 0.05*	0.44	*< 0.05*	0.24	0.11	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	0.07	0.12	0.11	*< 0.05*	1.13	1.63
Xylenes	**6.5**	DW	6.5	DW	2.4		< 0.1	< 0.2	1.8	< 0.2	1.1	0.5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.1	0.3	0.3	0.3	< 0.1	0.3	0.3
ortho-Xylene							< 0.05	< 0.05	0.6	< 0.05	0.34	0.16	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.1	0.07	0.06	< 0.05	0.06	0.06
Styrene	**5**	EH	50	EH	0.1	AL	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methyl t-butyl ether (MTBE)	**8000**	HH	20000	HH			< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
meta- & para-Xylene							< 0.05	< 0.05	1.21	< 0.05	0.71	0.34	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.22	0.24	0.22	< 0.05	0.2	0.22
1,2,3-Trichlorobenzene	**100**	EH	10000	EH	0.05	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	**2**	EH	10	EH	0.05	AL	-	< 0.05	-	< 0.05	-	-	< 0.05	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05
Hexachlorobutadiene	**30**	HH	250	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	**20000**	HH	150000	HH			-	< 0.5	-	< 0.5	-	-	< 0.5	-	< 0.5	< 0.5	-	-	< 0.5	-	-	< 0.5	< 0.5
2-Hexanone	**150**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone							-	< 0.5	-	< 0.5	-	-	< 0.5	-	< 0.5	< 0.5	-	-	< 0.5	-	-	< 0.5	< 0.5

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

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B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

1 = Qualifying ion outside of acceptance criteria. Results identified and potentially biased high.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Sample exceeds WLR standard
30	Sample exceeds CSR IL standard
23	Sample exceeds WLR standard

Table 14
Results of Soil Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_R (< 3m) Stage 10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-MW17-35	K19-TP17-51	K19-TP17-51	K19-TP17-52	K19-TP17-52	K19-TP17-52	K19-TP17-53	K19-TP17-54	K19-TP17-54	K19-TP17-55	K19-TP17-55	K19-TP17-55	K19-TP17-56	K19-TP17-56	K19-TP17-57	K19-TP17-57	K19-TP17-57
Sample Control Number							03847-10	03796-01	03796-05	03796-06	03796-07	03796-10	03796-12	03820-03	03820-07	03820-08	03820-10	03820-11	03821-03	03821-04	03821-05	03821-06	03821-09
Laboratory Report Number							17N243826	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668
Date Sampled							27-Jul-17	14-Jul-17	14-Jul-17	14-Jul-17	14-Jul-17	14-Jul-17	14-Jul-17	14-Jul-17	14-Jul-17	14-Jul-17	14-Jul-17	14-Jul-17	15-Jul-17	15-Jul-17	15-Jul-17	15-Jul-17	15-Jul-17
Depth of Sample (m bgs)							**6.5-7**	0.7	**4.9**	0.8	0.8	**4.0**	1.9	0.7	**4.1**	0.5	**3.0**	**4.0**	2.5	**4.0**	0.6	0.6	**4.0**
QA/QC										FDA	FD										FDA	FD	
APEC							1b	1b	1b	1e	1e	1e	1e	23a	23a	4	4	4	4	4	4	4	4
Volatile Organic Compounds																							
Acetone	**30000**	HH	200000	HH			-	-	-	0.8	0.6	-	-	-	-	-	< 0.5	-	-	< 0.5	< 0.5	< 0.5	-
Bromodichloromethane	**200**	HH	550	HH			-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
Bromomethane	**45**	HH	300	HH			-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
Dibromoethane																							
Bromoform	**650**	HH	4,000	HH			-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
Carbon Tetrachloride	**5**	EH	50	EH	0.1	AL	-	-	-	< 0.02	< 0.02	-	-	-	-	-	< 0.02	-	-	< 0.02	< 0.02	< 0.02	-
Chlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
Chloroethane							-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
Chloroform	**5**	EH	50	EH	0.1	AL	-	-	-	0.07	0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
Chloromethane							-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
Dichloromethane	**5**	EH	50	EH	0.1	AL	-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
Dibromochloromethane	**150**	HH	400	HH			-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
1,2-Dibromoethane	**7**	HH	15	HH			-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
1,2-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
1,3-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
1,4-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
Dichlorodifluoromethane	**6500**	HH	45,000	HH																			
1,1-Dichloroethane	**5**	EH	50	EH	0.1	AL	-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
1,2-Dichloroethane	**5**	EH	50	EH	0.1	AL	-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
1,1-Dichloroethylene	**5**	EH	50	EH	0.1	AL	-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
cis-1,2-Dichloroethylene	**5**	EH	50	EH			-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
trans-1,2-Dichloroethylene	**5**	EH	50	EH			-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
1,2-Dichloropropane	**5**	EH	50	EH	0.1	AL	-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
cis-1,3-Dichloropropylene	**5**	EH	50	EH			-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
trans-1,3-Dichloropropylene	**5**	EH	50	EH			-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
1,1,1,2-Tetrachloroethane	**550**	HH	1500	HH			-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
1,1,2,2-Tetrachloroethane	**70**	HH	150	HH	0.1	AL	-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
Tetrachloroethylene	**2.5**	AW	2.5	AW	0.1	AL	-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
1,1,1-Trichloroethane	**5**	EH	50	EH	0.1	AL	-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
1,1,2-Trichloroethane	**5**	EH	50	EH	0.1	AL	-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
Trichloroethylene	**0.3**	AW	0.3	AW	0.01		-	-	-	< 0.01	< 0.01	-	-	-	-	-	< 0.01	-	-	< 0.01	< 0.01	< 0.01	-
Trichlorofluoromethane	**9000**	HH	70,000	HH			-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
Vinyl Chloride	**2**	HH	45	HH			-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
Benzene	**0.035**	DW	0.035	DW	0.0068		0.08	-	-	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*
Toluene	**0.5**	AW	0.5	AW	0.08		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Ethylbenzene	**15**	DW	15	DW	0.018		*< 0.05*	-	-	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*
Xylenes	**6.5**	DW	6.5	DW	2.4		< 0.1	-	-	< 0.2	< 0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1	< 0.2	< 0.2	< 0.2	< 0.1
ortho-Xylene							< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Styrene	**5**	EH	50	EH	0.1	AL	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methyl t-butyl ether (MTBE)	**8000**	HH	20000	HH			< 0.1	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
meta- & para-Xylene							< 0.05	-	-	0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2,3-Trichlorobenzene	**100**	EH	10000	EH	0.05	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	**2**	EH	10	EH	0.05	AL	-	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-
Hexachlorobutadiene	**30**	HH	250	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	**20000**	HH	150000	HH			-	-	-	< 0.5	< 0.5	-	-	-	-	-	< 0.5	-	-	< 0.5	< 0.5	< 0.5	-
2-Hexanone	**150**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone							-	-	-	< 0.5	< 0.5	-	-	-	-	-	< 0.5	-	-	< 0.5	< 0.5	< 0.5	-

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

1 = Qualifying ion outside of acceptance criteria. Results identified and potentially biased high.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Sample exceeds WLR standard
30	Sample exceeds CSR IL standard
23	Sample exceeds WLR standard

Table 14
Results of Soil Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_R (< 3m) Stage10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-TP17-58	K19-TP17-58	K19-TP17-58	K19-TP17-59	K19-TP17-60	K19-TP17-61	K19-TP17-61	K19-TP17-61	K19-TP17-62	K19-TP17-62	K19-TP17-63	K19-TP17-63	K19-TP17-64	K19-TP17-65	K19-TP17-66	K19-TP17-67	K19-TP17-67
Sample Control Number							03821-10	03821-12	03822-01	03822-05	03822-10	03822-12	03823-01	03823-04	03823-07	03823-10	03823-12	03824-02	03824-06	03824-10	03825-02	03825-04	03825-07
Laboratory Report Number							17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971
Date Sampled							15-Jul-17	15-Jul-17	15-Jul-17	15-Jul-17	16-Jul-17	16-Jul-17	16-Jul-17	16-Jul-17	16-Jul-17	16-Jul-17	16-Jul-17	16-Jul-17	17-Jul-17	17-Jul-17	17-Jul-17	17-Jul-17	17-Jul-17
Depth of Sample (m bgs)							0.5	2.5	**4.0**	2.6	**3.7**	0.6	1.5	**4.4**	1.7	**4.2**	1.9	**4.0**	**4.2**	2.6	2.5	0.5	2.5
QA/QC																							
APEC							13	13	13	13	13	13	13	13	1e	1e	23a	23a	17	4	17	16	16
Volatile Organic Compounds																							
Acetone	**30000**	HH	200000	HH			-	-	< 0.5	< 0.5	< 0.5	-	< 0.5	-	-	-	< 0.5	-	< 0.5	< 0.5	< 0.5	-	< 0.5
Bromodichloromethane	**200**	HH	550	HH			-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
Bromomethane	**45**	HH	300	HH			-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
Dibromoethane																							
Bromoform	**650**	HH	4,000	HH			-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
Carbon Tetrachloride	**5**	EH	50	EH	0.1	AL	-	-	< 0.02	< 0.02	< 0.02	-	< 0.02	-	-	-	< 0.02	-	< 0.02	< 0.02	< 0.02	-	< 0.02
Chlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
Chloroethane							-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
Chloroform	**5**	EH	50	EH	0.1	AL	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
Chloromethane							-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
Dichloromethane	**5**	EH	50	EH	0.1	AL	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
Dibromochloromethane	**150**	HH	400	HH			-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
1,2-Dibromoethane	**7**	HH	15	HH			-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
1,2-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
1,3-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
1,4-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
Dichlorodifluoromethane	**6500**	HH	45,000	HH																			
1,1-Dichloroethane	**5**	EH	50	EH	0.1	AL	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
1,2-Dichloroethane	**5**	EH	50	EH	0.1	AL	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
1,1-Dichloroethylene	**5**	EH	50	EH	0.1	AL	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
cis-1,2-Dichloroethylene	**5**	EH	50	EH			-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
trans-1,2-Dichloroethylene	**5**	EH	50	EH			-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
1,2-Dichloropropane	**5**	EH	50	EH	0.1	AL	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
cis-1,3-Dichloropropylene	**5**	EH	50	EH			-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
trans-1,3-Dichloropropylene	**5**	EH	50	EH			-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
1,1,1,2-Tetrachloroethane	**550**	HH	1500	HH			-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
1,1,2,2-Tetrachloroethane	**70**	HH	150	HH	0.1	AL	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
Tetrachloroethylene	**2.5**	AW	2.5	AW	0.1	AL	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
1,1,1-Trichloroethane	**5**	EH	50	EH	0.1	AL	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
1,1,2-Trichloroethane	**5**	EH	50	EH	0.1	AL	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
Trichloroethylene	**0.3**	AW	0.3	AW	0.01		-	-	< 0.01	< 0.01	< 0.01	-	< 0.01	-	-	-	< 0.01	-	< 0.01	< 0.01	< 0.01	-	< 0.01
Trichlorofluoromethane	**9000**	HH	70,000	HH			-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
Vinyl Chloride	**2**	HH	45	HH			-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
Benzene	**0.035**	DW	0.035	DW	0.0068		-	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*
Toluene	**0.5**	AW	0.5	AW	0.08		-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Ethylbenzene	**15**	DW	15	DW	0.018		-	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*
Xylenes	**6.5**	DW	6.5	DW	2.4		-	< 0.1	< 0.2	< 0.2	< 0.2	< 0.1	< 0.2	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.1	< 0.2
ortho-Xylene							-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Styrene	**5**	EH	50	EH	0.1	AL	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methyl t-butyl ether (MTBE)	**8000**	HH	20000	HH			-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
meta- & para-Xylene							-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.05	< 0.05	< 0.05	< 0.05
1,2,3-Trichlorobenzene	**100**	EH	10000	EH	0.05	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	**2**	EH	10	EH	0.05	AL	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
Hexachlorobutadiene	**30**	HH	250	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	**20000**	HH	150000	HH			-	-	< 0.5	< 0.5	< 0.5	-	< 0.5	-	-	-	< 0.5	-	< 0.5	< 0.5	< 0.5	-	< 0.5
2-Hexanone	**150**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone							-	-	< 0.5	< 0.5	< 0.5	-	< 0.5	-	-	-	< 0.5	-	< 0.5	< 0.5	< 0.5	-	< 0.5

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

1 = Qualifying ion outside of acceptance criteria. Results identified and potentially biased high.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30 Sample exceeds WLR standard

30 Sample exceeds CSR IL standard

23 Sample exceeds WLR standard

Table 14
Results of Soil Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for WL_R (< 3m) Stage 10_3	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-TP17-68	K19-TP17-68	K19-TP17-68	K19-TP17-69	K19-TP17-69	K19-TP17-70	K19-TP17-70	K19-TP17-70	K19-TP17-71	K19-TP17-71	K19-TP17-71	K19-TP17-72	K19-TP17-73	K19-TP17-74	K19-TP17-74	K19-TP17-75	K19-TP17-75
Sample Control Number							03825-09	03825-11	03826-01	03826-04	03826-06	03826-10	03826-11	03826-12	03827-01	03827-03	03827-04	03827-08	03827-11	03828-02	03828-03	03828-06	03828-09
Laboratory Report Number							17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N242036	17N242036	17N242036	17N242036
Date Sampled							18-Jul-17	18-Jul-17	18-Jul-17	18-Jul-17	18-Jul-17	18-Jul-17	18-Jul-17	18-Jul-17	18-Jul-17	18-Jul-17	18-Jul-17	19-Jul-17	19-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17
Depth of Sample (m bgs)							0.6	2.5	**4.1**	2.6	**5.1**	2.4	**3.5**	**4.9**	0.5	2.5	2.5	2.4	1.4	1.6	1.6	0.6	**3.0**
QA/QC																FDA	FD			FDA	FD		
APEC							7b	7b	7b	1b	1b	1b	1b	1b	23a	23a	23a	27	27	12	12	12	12
Volatile Organic Compounds																							
Acetone	**30000**	HH	200000	HH			-	< 0.5	-	-	-	-	-	-	-	< 0.5	< 0.5	< 0.5	-	< 0.5	-	< 0.5	-
Bromodichloromethane	**200**	HH	550	HH			-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
Bromomethane	**45**	HH	300	HH			-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
Dibromoethane																							
Bromoform	**650**	HH	4,000	HH			-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
Carbon Tetrachloride	**5**	EH	50	EH	0.1	AL	-	< 0.02	-	-	-	-	-	-	-	< 0.02	< 0.02	< 0.02	-	< 0.02	-	< 0.02	-
Chlorobenzene	**1**	EH	10	EH	0.1	AL	-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
Chloroethane							-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
Chloroform	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
Chloromethane							-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
Dichloromethane	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
Dibromochloromethane	**150**	HH	400	HH			-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
1,2-Dibromoethane	**7**	HH	15	HH			-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
1,2-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
1,3-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
1,4-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
Dichlorodifluoromethane	**6500**	HH	45,000	HH																			
1,1-Dichloroethane	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
1,2-Dichloroethane	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
1,1-Dichloroethylene	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
cis-1,2-Dichloroethylene	**5**	EH	50	EH			-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
trans-1,2-Dichloroethylene	**5**	EH	50	EH			-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
1,2-Dichloropropane	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
cis-1,3-Dichloropropylene	**5**	EH	50	EH			-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
trans-1,3-Dichloropropylene	**5**	EH	50	EH			-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
1,1,1,2-Tetrachloroethane	**550**	HH	1500	HH			-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
1,1,2,2-Tetrachloroethane	**70**	HH	150	HH	0.1	AL	-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
Tetrachloroethylene	**2.5**	AW	2.5	AW	0.1	AL	-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
1,1,1-Trichloroethane	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
1,1,2-Trichloroethane	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
Trichloroethylene	**0.3**	AW	0.3	AW	0.01		-	< 0.01	-	-	-	-	-	-	-	< 0.01	< 0.01	< 0.01	-	< 0.01	-	< 0.01	-
Trichlorofluoromethane	**9000**	HH	70,000	HH			-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
Vinyl Chloride	**2**	HH	45	HH			-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
Benzene	**0.035**	DW	0.035	DW	0.0068		*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*
Toluene	**0.5**	AW	0.5	AW	0.08		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Ethylbenzene	**15**	DW	15	DW	0.018		*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*
Xylenes	**6.5**	DW	6.5	DW	2.4		< 0.1	< 0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.2	< 0.2	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1
ortho-Xylene							< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Styrene	**5**	EH	50	EH	0.1	AL	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methyl t-butyl ether (MTBE)	**8000**	HH	20000	HH			< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
meta- & para-Xylene							< 0.05	< 0.05	0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05
1,2,3-Trichlorobenzene	**100**	EH	10000	EH	0.05	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	**2**	EH	10	EH	0.05	AL	-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-
Hexachlorobutadiene	**30**	HH	250	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	**20000**	HH	150000	HH			-	< 0.5	-	-	-	-	-	-	-	< 0.5	< 0.5	< 0.5	-	< 0.5	-	< 0.5	-
2-Hexanone	**150**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone							-	< 0.5	-	-	-	-	-	-	-	< 0.5	< 0.5	< 0.5	-	< 0.5	-	< 0.5	-

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

1 = Qualifying ion outside of acceptance criteria. Results identified and potentially biased high.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Sample exceeds WLR standard
30	Sample exceeds CSR IL standard
23	Sample exceeds WLR standard

Table 14
Results of Soil Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location																				
Sample Control Number	BC CSR Standards for WL_R (< 3m) $Stage10_3$	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	K19-TP17-76	K19-TP17-76	K19-TP17-77	K19-TP17-77	K19-TP17-78	K19-TP17-78	K19-TP17-79	K19-TP17-80	K19-TP17-80	K19-TP17-81	K19-TP17-81	K19-TP17-82	K19-TP17-82	K19-TP17-82	K19-TP17-83	K19-TP17-83	K19-TP17-84
							03828-10	03829-02	03829-03	03829-06	03829-07	03829-10	03840-03	03840-06	03840-08	03840-09	03840-11	03841-02	03841-03	03841-05	03841-07	03841-09	03841-12
Laboratory Report Number							17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036
Date Sampled							20-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17
Depth of Sample (m bgs)							0.7	**3.2**	0.6	**3.3**	0.7	**3.2**	**3.0**	2.6	**4.3**	0.6	2.6	1.4	1.4	**4.2**	1.5	**3.9**	1.6
QA/QC																		FDA	FD				
APEC							12	12	11	11	11	11	1b	13	13	13	13	13	13	13	23a	23a	7a
Volatile Organic Compounds																							
Acetone	**30000**	HH	200000	HH			-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	-	< 0.5	< 0.5	< 0.5	-	-	-	-
Bromodichloromethane	**200**	HH	550	HH			-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
Bromomethane	**45**	HH	300	HH			-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
Dibromoethane																							
Bromoform	**650**	HH	4,000	HH			-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
Carbon Tetrachloride	**5**	EH	50	EH	0.1	AL	-	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	-	< 0.02	< 0.02	< 0.02	-	-	-	-
Chlorobenzene	**1**	EH	10	EH	0.1	AL	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
Chloroethane							-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
Chloroform	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
Chloromethane							-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
Dichloromethane	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
Dibromochloromethane	**150**	HH	400	HH			-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
1,2-Dibromoethane	**7**	HH	15	HH			-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
1,2-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
1,3-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
1,4-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
Dichlorodifluoromethane	**6500**	HH	45,000	HH																			
1,1-Dichloroethane	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
1,2-Dichloroethane	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
1,1-Dichloroethylene	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
cis-1,2-Dichloroethylene	**5**	EH	50	EH			-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
trans-1,2-Dichloroethylene	**5**	EH	50	EH			-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
1,2-Dichloropropane	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
cis-1,3-Dichloropropylene	**5**	EH	50	EH			-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
trans-1,3-Dichloropropylene	**5**	EH	50	EH			-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
1,1,1,2-Tetrachloroethane	**550**	HH	1500	HH			-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
1,1,2,2-Tetrachloroethane	**70**	HH	150	HH	0.1	AL	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
Tetrachloroethylene	**2.5**	AW	2.5	AW	0.1	AL	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
1,1,1-Trichloroethane	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
1,1,2-Trichloroethane	**5**	EH	50	EH	0.1	AL	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
Trichloroethylene	**0.3**	AW	0.3	AW	0.01		-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	-	< 0.01	< 0.01	< 0.01	-	-	-	-
Trichlorofluoromethane	**9000**	HH	70,000	HH			-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
Vinyl Chloride	**2**	HH	45	HH			-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
Benzene	**0.035**	DW	0.035	DW	0.0068		*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*
Toluene	**0.5**	AW	0.5	AW	0.08		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Ethylbenzene	**15**	DW	15	DW	0.018		*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	< 0.05	< 0.05	*< 0.05*	*< 0.05*
Xylenes	**6.5**	DW	6.5	DW	2.4		< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.1	< 0.2	< 0.2	< 0.2	< 0.1	< 0.1	< 0.1	< 0.1
ortho-Xylene							< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Styrene	**5**	EH	50	EH	0.1	AL	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methyl t-butyl ether (MTBE)	**8000**	HH	20000	HH			< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
meta- & para-Xylene							< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2,3-Trichlorobenzene	**100**	EH	10000	EH	0.05	AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	**2**	EH	10	EH	0.05	AL	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	-	-
Hexachlorobutadiene	**30**	HH	250	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	**20000**	HH	150000	HH			-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	-	< 0.5	< 0.5	< 0.5	-	-	-	-
2-Hexanone	**150**	HH	1000	HH			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone							-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	-	< 0.5	< 0.5	< 0.5	-	-	-	-

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface
Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

1 = Qualifying ion outside of acceptance criteria. Results identified and potentially biased high.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

30	Sample exceeds WLR standard
30	Sample exceeds CSR IL standard
23	Sample exceeds WLR standard

Table 14
Results of Soil Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-TP17-85	K19-TP17-86	K19-TP17-86	K19-TP17-87	K19-TP17-87
Sample Control Number	**BC CSR Standards for WL_R (< 3m) Stage10_3**	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	03842-04	03842-08	03842-11	03843-02	03843-04
Laboratory Report Number							17N242036	17N242036	17N242036	17N242036	17N242036
Date Sampled							22-Jul-17	22-Jul-17	22-Jul-17	22-Jul-17	22-Jul-17
Depth of Sample (m bgs)							1.5	0.7	**4.0**	2.8	**4.8**
QA/QC											
APEC							13	15	15	26	26
Volatile Organic Compounds											
Acetone	**30000**	HH	200000	HH			< 0.5	-	-	-	< 0.5
Bromodichloromethane	**200**	HH	550	HH			< 0.05	-	-	-	< 0.05
Bromomethane	**45**	HH	300	HH			< 0.05	-	-	-	< 0.05
Dibromoethane											
Bromoform	**650**	HH	4,000	HH			< 0.05	-	-	-	< 0.05
Carbon Tetrachloride	**5**	EH	50	EH	0.1	AL	< 0.02	-	-	-	< 0.02
Chlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.05	-	-	-	< 0.05
Chloroethane							< 0.05	-	-	-	< 0.05
Chloroform	**5**	EH	50	EH	0.1	AL	< 0.05	-	-	-	< 0.05
Chloromethane							< 0.05	-	-	-	< 0.05
Dichloromethane	**5**	EH	50	EH	0.1	AL	< 0.05	-	-	-	< 0.05
Dibromochloromethane	**150**	HH	400	HH			< 0.05	-	-	-	< 0.05
1,2-Dibromoethane	**7**	HH	15	HH			< 0.05	-	-	-	< 0.05
1,2-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.05	-	-	-	< 0.05
1,3-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.05	-	-	-	< 0.05
1,4-Dichlorobenzene	**1**	EH	10	EH	0.1	AL	< 0.05	-	-	-	< 0.05
Dichlorodifluoromethane	**6500**	HH	45,000	HH							
1,1-Dichloroethane	**5**	EH	50	EH	0.1	AL	< 0.05	-	-	-	< 0.05
1,2-Dichloroethane	**5**	EH	50	EH	0.1	AL	< 0.05	-	-	-	< 0.05
1,1-Dichloroethylene	**5**	EH	50	EH	0.1	AL	< 0.05	-	-	-	< 0.05
cis-1,2-Dichloroethylene	**5**	EH	50	EH			< 0.05	-	-	-	< 0.05
trans-1,2-Dichloroethylene	**5**	EH	50	EH			< 0.05	-	-	-	< 0.05
1,2-Dichloropropane	**5**	EH	50	EH	0.1	AL	< 0.05	-	-	-	< 0.05
cis-1,3-Dichloropropylene	**5**	EH	50	EH			< 0.05	-	-	-	< 0.05
trans-1,3-Dichloropropylene	**5**	EH	50	EH			< 0.05	-	-	-	< 0.05
1,1,1,2-Tetrachloroethane	**550**	HH	1500	HH			< 0.05	-	-	-	< 0.05
1,1,2,2-Tetrachloroethane	**70**	HH	150	HH	0.1	AL	< 0.05	-	-	-	0.13
Tetrachloroethylene	**2.5**	AW	2.5	AW	0.1	AL	< 0.05	-	-	-	< 0.05
1,1,1-Trichloroethane	**5**	EH	50	EH	0.1	AL	< 0.05	-	-	-	< 0.05
1,1,2-Trichloroethane	**5**	EH	50	EH	0.1	AL	< 0.05	-	-	-	< 0.05
Trichloroethylene	**0.3**	AW	0.3	AW	0.01		< 0.01	-	-	-	< 0.01
Trichlorofluoromethane	**9000**	HH	70,000	HH			< 0.05	-	-	-	< 0.05
Vinyl Chloride	**2**	HH	45	HH			< 0.05	-	-	-	< 0.05
Benzene	**0.035**	DW	0.035	DW	0.0068		*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*	*< 0.02*
Toluene	**0.5**	AW	0.5	AW	0.08		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Ethylbenzene	**15**	DW	15	DW	0.018		*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*
Xylenes	**6.5**	DW	6.5	DW	2.4		< 0.2	< 0.1	< 0.1	< 0.1	< 0.2
ortho-Xylene							< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Styrene	**5**	EH	50	EH	0.1	AL	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methyl t-butyl ether (MTBE)	**8000**	HH	20000	HH			< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
meta- & para-Xylene							< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2,3-Trichlorobenzene	**100**	EH	10000	EH	0.05	AL	-	-	-	-	-
1,2,4-Trichlorobenzene	**2**	EH	10	EH	0.05	AL	< 0.05	-	-	-	< 0.05
Hexachlorobutadiene	**30**	HH	250	HH			-	-	-	-	-
2-Butanone	**20000**	HH	150000	HH			< 0.5	-	-	-	< 0.5
2-Hexanone	**150**	HH	1000	HH			-	-	-	-	-
4-Methyl-2-pentanone							< 0.5	-	-	-	< 0.5

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface
Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

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1 = Qualifying ion outside of acceptance criteria. Results identified and potentially biased high.

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30	Sample exceeds WLR standard
30	Sample exceeds CSR IL standard
23	Sample exceeds WLR standard

Table 15
Results of Soil Analyses - Glycols
K19 - Trutch Former Townsite
Alaska Highway, BC

Location							K19-TP16-30	K19-TP16-42	K19-TP16-46	K19-HA17-10	K19-MW17-30	K19-MW17-31	K19-MW17-32	K19-TP17-74	K19-TP17-74	K19-TP17-75	K19-TP17-76	K19-TP17-77	K19-TP17-78
Sample Control Number							01485-01	01490-06	01491-10	04263-04	03838-11	03839-05	03839-11	03828-02	03828-03	03828-06	03828-10	03829-03	03829-07
Laboratory Report Number							B675954	B676470	B676470	17N271535	17N243343	17N243826	17N243826	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036
Date Sampled							1-Sep-16	3-Sep-16	3-Sep-16	11-Oct-17	25-Jul-17	26-Jul-17	26-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17	20-Jul-17
Depth of Sample (m bgs)							1.0	2.0	0.5	1 - 1.5	0.3	0.3	0.3	1.6	1.6	0.6	0.7	0.6	0.7
QA/QC														FDA	FD				
APEC										9	12	11	1d	12	12	12	12	11	11
Glycols																			
Ethylene Glycol	**10**	DW	10	DW	960		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Diethylene Glycol							< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Triethylene Glycol	**65000**	HH	450000	HH			< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Tetraethylene Glycol							< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Propylene Glycol							< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs = meters below ground surface
Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

QA/QC = Quality Assurance, Quality Control.
FDA = Field Duplicate Available; FD = Field Duplicate.
Italics = indicates that the detection limit exceeds one or more criteria.

30	Sample exceeds WLR standard
30	Sample exceeds CSR IL standard
23	Sample exceeds WLR standard

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Table 16
Results of Soil Analyses - Pesticides
K19 - Trutch Former Townsite
Alaska Highway, BC

Location						K19-TP16-14	K19-TP16-31	K19-TP16-45	K19-TP16-46	K19-SS16-04	K19-TP17-57
Sample Control Number	**BC CSR Standards for WL_R (< 3m) Stage10_3**	Notes	BC CSR Standards for IL (> 3m) Stage 10_3	Notes	CCME Guidelines for RL/PL & AL	Notes	01463-12	01485-08	01491-07	01491-10	01481-12	03821-06
Laboratory Report Number							B674520	B675954	B676470	B676470	B675549	17N238668
Date Sampled							29-Aug-16	1-Sep-16	4-Sep-16	4-Sep-16	31-Aug-16	15-Jul-17
Depth of Sample (m bgs)							0.9	0.9	1.5	0.5	0.32	0.6
QA/QC												
APEC												4
Pesticides												
4,4-DDD							0.053	< 0.0020	< 0.0020	-	-	-
4,4-DDE							<0.010	< 0.0020	< 0.0020	-	-	-
4,4-DDT							<0.010	< 0.0020	< 0.0020	0.024	0.27	< 0.005
DDD, Total	**0.7**	T	10	T			0.066	< 0.0020	< 0.0020	-	-	< 0.007
DDE, Total							<0.010	< 0.0020	< 0.0020	-	-	-
DDT+ metabolites							0.066	< 0.0020	< 0.0020	0.39	0.48	-
DDT, Total	**0.7**	T	10	T	0.7		<0.010	< 0.0020	< 0.0020	0.032	0.32	-
o,p'-DDE							<0.010	< 0.0020	< 0.0020	-	-	-
o,p'-DDD							0.013	< 0.0020	< 0.0020	-	-	-
o,p'-DDT							<0.010	< 0.0020	< 0.0020	0.0073	0.053	< 0.005
Aldrin + Dieldrin	**0.15**	HH	0.4	HH			-	-	< 0.0020	-	-	-
Chlordane (Total)	**8**	HH	20	HH			-	-	< 0.0020	-	-	-
Heptachlor	**0.6**	HH	1.5	HH			-	-	< 0.0020	-	-	-
Endosulfan (Total)	**500**	HH	40000	HH			-	-	< 0.0020	-	-	-
Mexthoxychlor	**150**	HH	1000	HH			-	-	< 0.0050	-	-	-
Organic Chlorinated Compounds												
Total Polychlorinated Biphenyls (PCBs)	**1.5**	T	35	T	0.5	AL	-	-	<0.015	-	-	

Notes:

All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m = metres; bgs = below ground surface

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Soil Quality Guidelines for protection of environmental and human health. The most conservative guidelines for Residential (RL)/ Park Land (PL) and Agricultural Land (AL) land use are applied. Where applicable, the most conservative guideline for fine-grained, surface soils are used.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).

Current Site Land Use is Wildlands (WL); under the CSR Wildlands (reverted) Land Use (WLR) standards are applied soil above 3 m, and Industrial Land Use (IL) standards are applied to soil below 3 m.

Most conservative CSR standard applied of generic (G), intake of contaminated soil (I), toxicity to soil invertebrates and plants (T), freshwater aquatic life (AW), drinking water (DW), protection of human health (HH) and protection of ecological health (EH).

QA/QC = Quality Assurance, Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

Italics = indicates that the detection limit exceeds one or more criteria.

30	Sample exceeds WLR standard
30	Sample exceeds CSR IL standard
23	Sample exceeds WLR standard

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Guidelines shown are from the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines; Guidelines for Freshwater Aquatic life reflect a 10 times dilution inferred when extrapolating from surface water to groundwater.

Table 17
Results of Soil Analyses - Leachable Volatiles, Anions and Nutrients
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR HWR Leachate Quality Standards	K19-TP16-30	K19-TP16-35	K19-TP17-26	K19-MW17-35	K19-MW17-35	K19-MW17-29	K19-MW17-29	K19-MW17-29	K19-TP17-51	K19-TP17-70	K19-TP17-70
Sample Control Number		01485-04	01487-06	03350-08	03847-02	03847-08	03838-06	03838-07	03838-08	03796-03	03826-07	03826-08
Laboratory Report Number		B675954	B676013	B708210	17N243826	17N243826	17N243343	17N243343	17N243343	17N238668	17N240971	17N240971
Date Sampled		1-Sep-16	2-Sep-16	26-Jan-17	07/27/2017	07/27/2017	07/24/2017	07/24/2017	07/24/2017	07/14/2017	07/18/2017	07/18/2017
Depth of Sample (m bgs)		2.9	3.0	4.4	1-1.5	4-4.5	2.5-2.8	3.4-3.7	3.4-3.7	2.8	0.5	0.5
QA/QC								FDA	FD		FDA	FD
APEC/AEC		2b	25	1b	1b	1b	1b	1b	1b	1b	1b	1b
Leachable Non-Halogenated Volatiles												
Leachate Benzene	**0.5**	0.015	<0.010	0.035	-	<0.005	<0.005	<0.005	<0.005	-	-	-
Leachate Toluene	**2.4**	0.41	<0.010	0.017	-	<0.005	<0.005	0.005	<0.005	-	-	-
Leachate Ethylbenzene	**0.24**	**0.25**	0.037	0.048	-	0.013	<0.005	<0.005	<0.005	-	-	-
Leachate m & p-Xylene		1.1	0.13	0.064	-	-	-	-	-	-	-	-
Leachate o-Xylene		0.73	0.037	<0.010	-	-	-	-	-	-	-	-
Leachate Styrene		<0.010	<0.010	<0.010	-	-	-	-	-	-	-	-
Leachate Xylenes (Total)	**30**	1.9	0.17	0.064	-	0.014	<0.005	0.008	<0.005	-	-	-
Leachable Anions and Nutrients												
Fluoride - Leachate (SWEP)	**150**	-	-	-	<0.5	<0.5	-	-	-	<0.5	<0.5	<0.5
Nitrate - Leachate (SWEP)	**4500**	-	-	-	<0.5	<0.5	-	-	-	<0.5	<0.5	<0.5
Nitrite - Leachate (SWEP)	**320**	-	-	-	<0.5	<0.5	-	-	-	<0.5	<0.5	<0.5
Cyanide - Leachate (SWEP)	**20**	-	-	-	<0.002	<0.002	-	-	-	<0.002	<0.002	<0.002

Notes:

All parameter units in milligrams per liter (mg/L), unless otherwise noted; m = metres; bgs = below ground surface

Standards shown are from the Contaminated Sites Regulation (CSR) BC Reg. 63/88, Schedule 1 Hazardous Waste Regulation (HWR), including amendments up to BC Reg 179/20176, July 19, 2016.

< = Less than the laboratory method detection limit

Table 18
Results of Groundwater Analyses - Dissolved Metals
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	Notes	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Notes	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19A-09MW-01	K19A-09MW-01	K19A-09MW-01	K19A-09MW-02	K19A-09MW-02	K19A-09MW-02	K19A-09MW-03	K19A-09MW-03	K19A-09MW-03	K19-09MW-03	K19A-09MW-04	K19A-09MW-05	K19A-09MW-05	K19A-09MW-06	K19A-09MW-06
Sample Control Number									K19A-09MW-01	03375-01	03375-02	K19A-09MW-02	06706-05	03830-05	-	06706-04	K19A-09MW-03	03816-03	K19A-09MW-04	K19A-09MW-05	MWA	-	K19A-09MW-06
Laboratory Report Number									B648291	B709734	B709734	B646703	B710365	17N240971	101110157	B710365	B646703	17N242036	B646703	B646703	B646703	101110157	B646703
Date Sampled									10-Jun-16	4-Feb-17	4-Feb-17	8-Jun-16	9-Feb-17	16-Jul-17	7-Nov-09	9-Feb-17	9-Jun-16	21-Jul-17	7-Jun-16	7-Jun-16	7-Jun-16	5-Nov-09	7-Jun-16
QA/QC										FDA	FD			N				N		FDA	FD		
APEC												1a	1a	1a	1a	1a	1a	1a				1a	1a
Field Parameters																							
Dissolved Oxygen									1.13	2.66	2.66	0.50	-	3.78	-	-	7.43	0.09	0.74	0.2	0.2	-	0.02
Conductivity (µS/cm)									1063	934	934	2782	-	2614	-	-	614.0	646.7	1061	880	880	-	6713
Oxidation Reduction Potential (mV)									-33.6	-29.3	-29.3	12.9	-	5.4	-	-	115.2	-121.4	-15	17.4	17.4	-	-10.9
pH (pH units)									6.74	6.72	6.72	6.71	-	6.84	-	-	6.97	7.4	6.13	6.99	6.99	-	6.20
Temperature (°C)									8.1	2.7	2.7	7.0	-	5.2	-	-	6.0	6.9	7.5	6.5	6.5	-	8.3
Physical Tests																							
Hardness (as CaCO3)									475	453	448	1300	1330	1130	284	136	211	111	430	356	364	-	2530
Salinity			15000						57.7	62.1	60.8	170	164		-	31.4	35.5		25.3	53.6	53.5	-	1040
Anions and Nutrients																							
Chloride	**250**		1500		120		250	AO	110	87	88	**780**	**760**	**696**	-	19	22	0.38	**270**	33	32	-	**2400**
Dissolved Metals																							
Aluminum	**9.5**				0.5	IG/L	0.1	OG	0.0048	0.006	0.0057	0.0044	<0.03	0.002	0.017	0.0045	0.014	<0.002	0.0093	0.006	0.0064	-	0.0066
Antimony	**0.006**		0.09		2	FW	0.006		< 0.00050	<0.0005	<0.0005	< 0.00050	<0.005	<0.0002	<0.0005	<0.0005	< 0.00050	<0.0002	< 0.00050	< 0.00050	< 0.00050	-	0.00343
Arsenic	**0.01**		0.05		0.005	FW	0.01		0.00088	0.0006	0.00068	0.0001	0.001	0.0001	0.001	0.00029	0.00017	0.0012	0.00046	0.00015	0.00011	-	0.00104
									#NAME?	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Barium	**1**		10		2.9	FW	1		**11.4**	**8.04**	**8.13**	**19**	**15.6**	**1.31**	0.21	0.291	0.372	0.879	0.722	**2.68**	**2.75**	-	**2.3**
Beryllium	**0.008**		0.0015		0.0053	FW			< 0.00010	<0.0001	<0.0001	< 0.00010	<0.001	<0.00001	<0.0005	<0.0001	< 0.00010	<0.00001	< 0.00010	< 0.00010	< 0.00010	-	< 0.00010
Bismuth									< 0.0010	<0.001	<0.001	< 0.0010	<0.01	<0.00005	<0.0005	<0.001	< 0.0010	<0.00005	< 0.0010	< 0.0010	< 0.0010	-	< 0.0010
Boron	**5**		12		0.5	IG	5		0.166	0.163	0.16	0.249	<0.5	0.214	0.07	<0.05	0.061	0.284	0.053	0.1	0.106	-	0.1
Cadmium	**0.005**		0.0005 - 0.004	H	0.000017	FW	0.005		< 0.000010	<0.00001	<0.00001	0.000012	*<0.0001*	<0.00001	0.00014	0.000024	0.000025	<0.00001	< 0.000010	< 0.000010	< 0.000010	-	0.000022
Calcium									126	124	124	347	352	300	73.3	34.6	56.8	22.1	113	96	97.2	-	662
Chromium	**0.05VI/6III**	V	0.01VI/0.09III	V	0.0089	FW	0.05^{VI}	V	< 0.0010	<0.001	<0.001	< 0.0010	*<0.01*	<0.0005	<0.001	<0.001	< 0.0010	<0.0005	< 0.0010	< 0.0010	< 0.0010	-	< 0.0010
Cobalt	**0.001**		0.04		1	L			< 0.00050	<0.0005	<0.0005	< 0.00050	*<0.005*	<0.00005	**0.0041**	<0.0005	< 0.00050	0.00086	< 0.00050	< 0.00050	< 0.00050	-	< 0.00050
Copper	**1.5**		0.02	H	0.2	IG	1	AO	0.00183	<0.0002	<0.0002	< 0.00020	<0.002	<0.0002	0.0012	0.00149	0.00168	<0.0002	0.00024	0.00021	0.00021	-	0.00045
Iron	**6.5**				0.3	FW	0.3	AO	6.62	6.29	6.29	1.93	2.43	1.75	1.36	0.0154	0.0399	3.21	29.5	0.311	0.312	-	26.1
Lead	**0.01**		0.04	H	0.1	L	0.01		< 0.00020	<0.0002	<0.0002	< 0.00020	<0.002	<0.00005	<0.00025	<0.0002	0.00044	<0.00005	< 0.00020	< 0.00020	< 0.00020	<0.00025	**0.0422**
Lithium	**0.008**								**0.0937**	**0.0814**	**0.0808**	**0.18**	**0.148**	**0.174**	**0.048**	**0.0157**	**0.0091**	**0.155**	**0.0423**	**0.0699**	**0.0706**	-	**0.14**
Magnesium									38.9	34.6	33.8	105	110	91.3	24.5	12.2	16.8	13.6	35.7	28.3	29.4	-	214
Manganese	**1.5**				0.2	IG	0.05	AO	0.528	0.333	0.336	0.722	0.717	0.597	0.312	0.0127	0.0069	0.321	0.497	0.158	0.164	-	1.08
Mercury	**0.001**		0.00025		0.000026	FW	0.001		< 0.000010	<0.00001	<0.00001	< 0.000010	<0.00001	<0.00001	<0.00002	<0.00001	< 0.000010	<0.00001	< 0.000010	< 0.000010	< 0.000010	-	< 0.000010
Molybdenum	**0.25**		10		0.073	FW			< 0.0010	<0.001	<0.001	< 0.0010	<0.01	<0.00005	<0.0005	<0.001	< 0.0010	0.00021	< 0.0010	< 0.0010	< 0.0010	-	< 0.0010
Nickel	**0.08**		0.25	H	0.2	IG			< 0.0010	<0.001	<0.001	< 0.0010	<0.01	<0.0002	0.012	0.0029	0.0037	0.0009	< 0.0010	0.0011	< 0.0010	-	0.0012
Phosphorus									-	-	-	-	-	-	<0.075	-	-	-	-	-	-	-	-
Potassium									2.52	2.55	2.54	4.56	5.01	4.39	1.76	1.02	0.947	1.73	1.39	4.09	4.19	-	6
Selenium	**0.01**		0.02		0.001	FW	0.01		0.0001	<0.0001	<0.0001	< 0.00010	<0.001	<0.0005	<0.001	0.00122	0.00024	<0.0005	< 0.00010	< 0.00010	< 0.00010	-	< 0.00010
Silicon									6.49	7.14	7.37	5.93	6.21	4.59	7.5	6.32	4.71	3.54	7.97	5.71	5.7	-	7.58
Silver	**0.02**		0.0005	H	0.0001	FW			< 0.000020	<0.00002	<0.00002	< 0.000020	*<0.0002*	<0.00002	*<0.0002*	<0.00002	< 0.000020	<0.00002	< 0.000020	< 0.000020	< 0.000020	-	< 0.000020
Sodium	**200**						200	AO	22.7	24.4	23.9	66.7	64.5	62	57.1	41.8	27.4	95.8	9.94	71.9	74.1	-	**410**
Strontium	**2.5**								0.963	0.901	0.927	2.5	2.3	**2.57**	0.221	0.0999	0.16	0.654	0.356	0.483	0.462	-	2.06
Sulphur									< 3.0	<3	<3	< 3.0	<30	4.47	7	6.9	3.8	<0.5	< 3.0	< 3.0	< 3.0	-	4.5
Tellurium									-	-	-	-	-		<0.001	-	-		-	-	-	-	-
Thallium			0.003		0.0008	FW			< 0.000050	<0.00001	<0.00001	< 0.000050	*<0.0001*	<0.00001	*<0.0001*	0.000012	< 0.000050	<0.00001	< 0.000050	< 0.000050	< 0.000050	-	< 0.000050
Thorium-232									-	-	-	-	-		<0.00025	-	-		-	-	-	-	-
Tin	**2.5**								< 0.0050	<0.005	<0.005	< 0.0050	<0.05	0.00008	<0.0005	<0.005	< 0.0050	<0.00005	< 0.0050	< 0.0050	< 0.0050	-	< 0.0050
Titanium			1		0.1	FW			< 0.0050	<0.005	<0.005	< 0.0050	<0.05	0.0017	<0.001	<0.005	< 0.0050	0.0014	< 0.0050	< 0.0050	< 0.0050	-	< 0.0050
Uranium	**0.02**		0.085		0.01	IG	0.02		< 0.00010	<0.0001	<0.0001	< 0.00010	<0.001	<0.00001	<0.00025	0.0003	0.00083	0.00004	< 0.00010	0.00029	< 0.00010	-	< 0.00010
Vanadium	**0.02**				0.1	IG/L			< 0.0050	<0.005	<0.005	< 0.0050	*<0.05*	<0.0005	<0.0005	<0.005	< 0.0050	<0.0005	< 0.0050	< 0.0050	< 0.0050	-	< 0.0050
Zinc	**3**		0.075 - 2.4	H	0.03	FW	5	AO	0.0101	0.0058	0.0055	0.0091	*<0.05*	0.016	0.011	<0.005	< 0.0050	<0.002	< 0.0050	< 0.0050	< 0.0050	-	< 0.0050
Zirconium									< 0.00050	<0.0005	<0.0005	< 0.00050	<0.005	<0.0001	<0.0005	<0.0005	< 0.00050	0.0001	< 0.00050	< 0.00050	< 0.00050	-	< 0.00050
Cesium									-	-	-	-	-	-	<0.0000005	-	-	-	-	-	-	-	-
Lanthanum									-	-	-	-	-	-	<0.00005	-	-	-	-	-	-	-	-
Rhenium									-	-	-	-	-	-	<0.0000005	-	-	-	-	-	-	-	-
Rubidium									-	-	-	-	-	-	0.0000012	-	-	-	-	-	-	-	-
Tungsten	**0.003**								-	-	-	-	-	-	<0.0000005	-	-	-	-	-	-	-	-

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.
Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.
B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)
Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.
H = Hardness-dependant; V= Standard is valence dependent. VI refers to chromium [VI] and III refers to chromium [III]
Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied
AO = Aesthetic Objective; OG = Operational Guideline
Site falls under Schedule 2 G2 activity; CSR iron and manganese standards do not
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate.
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 18
Results of Groundwater Analyses - Dissolved Metals
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	Notes	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Notes	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19A-09MW-06	K19-09MW-06	K19-09MW-06	K19A-09MW-07	K19A-09MW-08	K19A-09MW-09	K19A-09MW-09	K19-09MW-09	K19A-09MW-10	K19A-10MW-02	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	K19A-10MW-04	K19A-10MW-05
Sample Control Number									06706-01	03830-02	03830-03	K19A-09MW-07	K19A-09MW-08	K19A-09MW-09	06706-03	03816-01	K19A-09MW-10	K19A-10MW-02	K19A-10MW-03	SAMPLE E	06690-02	3808-06	K19A-10MW-04	K19A-10MW-05
Laboratory Report Number									B710365	17N240971	17N240971	B648667	B648667	B650178	B710365	17N242036	B650178	B648291	B650178	B650178	B710365	17N238668	B648667	B646703
Date Sampled									8-Feb-17	16-Jul-17	16-Jul-17	13-Jun-16	13-Jun-16	16-Jun-16	8-Feb-17	21-Jul-17	16-Jun-16	10-Jun-16	16-Jun-16	16-Jun-16	7-Feb-17	14-Jul-17	15-Jun-16	7-Jun-16
QA/QC										N	FD					N			FDA	FD		N		
APEC									1a	1a	1a			7b, 23a	7b, 23a	7b, 23a			1b	1b	1b	1b		
Field Parameters																								
Dissolved Oxygen									-	2.3	2.3	1.72	1.47	1.40	-	1.51	0.99	0.50	0.51	0.51	1.92	2.55	2.41	0.1
Conductivity (µS/cm)									-	6433	6433	329.4	2272	3504	-	2856	444.2	2782	897	897	1162	1092	901	1021
Oxidation Reduction Potential (mV)									-	-22.1	-22.1	72.5	39.2	35.3	-	18.2	14.9	12.9	-31.3	-31.3	-6.8	-121.1	55.9	-60.8
pH (pH units)									-	6.18	6.18	6.09	5.85	5.75	-	5.81	6.42	6.91	6.75	6.75	6.81	6.83	7.29	7.00
Temperature (°C)									-	5.7	5.7	6.1	6.9	4.5	-	5.3	4.2	7.0	4.7	4.7	1.6	6.1	11.1	10.2
Physical Tests																								
Hardness (as CaCO3)									2790	2670	2730	184	163	1510	1510	1420	223	167	423	401	416	411	182	161
Salinity			15000						1190			-	72.2	60	58.4		-	70.5	40.5	-	43		-	-
Anions and Nutrients																								
Chloride	**250**		1500		120		250	AO	**2800**	**2720**	**2720**	-	**690**	**1200**	**1100**	**1170**	-	64	82	-	75	86.9	-	-
Dissolved Metals																								
Aluminum	**9.5**				0.5	IG/L	0.1	OG	0.0093	0.004	0.004	0.0094	0.0103	0.0268	0.0243	0.018	0.0187	0.0079	0.0041	< 0.0030	0.531	0.006	0.006	0.0062
Antimony	**0.006**		0.09		2	FW	0.006		0.0038	0.0004	0.0004	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.0002	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.002	<0.0002	< 0.00050	< 0.00050
Arsenic	**0.01**		0.05		0.005	FW	0.01		0.00039	0.0005	0.0007	0.0001	0.0001	0.00015	0.0002	0.0001	0.0001	0.00104	0.0001	0.0001	0.0004	0.0001	0.00024	0.00046
									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barium	**1**		10		2.9	FW	1		**2.6**	**2.34**	**2.3**	0.175	0.322	0.681	0.636	0.623	0.117	**2.62**	**11.8**	**11.5**	**11.4**	**10.4**	**3.98**	0.428
Beryllium	**0.008**		0.0015		0.0053	FW			<0.0001	0.00001	<0.00001	< 0.00010	< 0.00010	< 0.00010	<0.0001	0.00003	< 0.00010	< 0.00010	< 0.00010	< 0.00010	<0.0004	<0.00001	< 0.00010	< 0.00010
Bismuth									<0.001	<0.00005	<0.00005	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.00005	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.004	<0.00005	< 0.0010	< 0.0010
Boron	**5**		12		0.5	IG	5		0.128	0.1	0.092	0.066	0.111	0.126	0.151	0.138	0.064	0.103	0.16	0.189	<0.2	0.138	0.107	0.12
Cadmium	**0.005**		0.0005 - 0.004	H	0.000017	FW	0.005		0.000017	<0.00001	<0.00001	0.000012	< 0.000010	0.000071	0.000026	0.00002	0.000032	< 0.000010	< 0.000010	< 0.000010	<0.00004	<0.00001	0.000119	< 0.000010
Calcium									711	660	688	35.8	220	390	398	370	52.1	131	110	102	110	109	194	121
Chromium	**0.05VI/6III**	V	0.01VI/0.09III	V	0.0089	FW	0.05^{VI}	V	<0.001	<0.0005	<0.0005	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.0005	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.004	<0.0005	< 0.0010	< 0.0010
Cobalt	**0.001**		0.04		1	L			<0.0005	0.00012	0.00012	< 0.00050	0.00051	< 0.00050	<0.0005	**0.00106**	**0.00101**	**0.00435**	< 0.00050	< 0.00050	*<0.002*	<0.00005	**0.006**	< 0.00050
Copper	**1.5**		0.02	H	0.2	IG	1	AO	0.0008	<0.0002	<0.0002	0.0003	< 0.00020	< 0.00020	<0.0002	<0.0002	0.0025	0.00027	< 0.00020	< 0.00020	<0.0008	<0.0002	0.00304	0.00034
Iron	**6.5**				0.3	FW	0.3	AO	33.4	34.7	34.2	0.05	49.6	60.9	59.5	58.5	0.212	5.39	3.71	3.77	4.23	4.87	0.065	1.14
Lead	**0.01**		0.04	H	0.1	L	0.01		**0.0929**	0.00374	0.00377	< 0.00020	< 0.00020	< 0.00020	0.00024	<0.00005	< 0.00020	< 0.00020	< 0.00020	< 0.00020	<0.0008	<0.00005	< 0.00020	0.00023
Lithium	**0.008**								**0.142**	**0.15**	**0.147**	**0.0498**	**0.125**	**0.25**	**0.228**	**0.235**	**0.059**	**0.0702**	**0.0892**	**0.0833**	**0.07**	**0.0755**	**0.0643**	**0.0737**
Magnesium									246	249	245	11.5	83	130	126	120	22.7	37.6	36	35.6	34.5	33.7	58.2	34.5
Manganese	**1.5**				0.2	IG	0.05	AO	1.41	1.4	1.39	0.0411	8.64	21.7	21.7	20.8	1.32	0.281	0.623	0.665	0.592	0.546	0.741	0.228
Mercury	**0.001**		0.00025		0.000026	FW	0.001		<0.00001	<0.00001	<0.00001	< 0.000010	< 0.000010	< 0.000010	<0.00001	<0.00001	< 0.000010	< 0.000010	< 0.000010	< 0.000010	<0.00001	<0.00001	< 0.000010	< 0.000010
Molybdenum	**0.25**		10		0.073	FW			<0.001	0.00006	0.00006	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.00005	< 0.0010	0.0011	< 0.0010	< 0.0010	<0.004	<0.00005	< 0.0010	< 0.0010
Nickel	**0.08**		0.25	H	0.2	IG			<0.001	0.0003	0.0002	0.0022	0.0021	< 0.0010	<0.001	0.0016	0.0273	0.0164	< 0.0010	< 0.0010	<0.004	<0.0002	0.0154	0.0012
Phosphorus									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium									6.7	6.89	6.94	1.16	2.6	3.24	3.34	3.22	1.06	2.56	2.1	2.09	2.13	1.99	2.68	3.2
Selenium	**0.01**		0.02		0.001	FW	0.01		<0.0001	<0.0005	<0.0005	< 0.00010	< 0.00010	< 0.00010	<0.0001	<0.0005	< 0.00010	0.00038	< 0.00010	< 0.00010	<0.0004	0.0008	0.00014	< 0.00010
Silicon									8.3	6.17	6.11	7.99	9.65	9.56	11	8.1	6.25	4.93	6.17	5.65	6.04	5.04	5.67	5.64
Silver	**0.02**		0.0005	H	0.0001	FW			<0.00002	<0.00002	<0.00002	< 0.000020	< 0.000020	< 0.000020	<0.00002	<0.00002	< 0.000020	< 0.000020	< 0.000020	< 0.000020	<0.00008	<0.00002	< 0.000020	< 0.000020
Sodium	**200**						200	AO	**467**	**452**	**460**	13.5	28.4	23.6	23	21.9	8.84	27.7	15.9	16.5	16.9	16.2	154	69.7
Strontium	**2.5**								2.04	**2.69**	**2.57**	0.147	0.803	2.23	2.02	**2.58**	0.201	0.668	0.802	0.825	0.776	0.937	0.911	0.461
Sulphur									4.1	11.3	11	< 3.0	< 3.0	< 3.0	<3	6.13	4.2	4.3	< 3.0	< 3.0	<12	1.77	5.6	< 3.0
Tellurium									-			-	-	-	-		-	-	-	-	-		-	-
Thallium			0.003		0.0008	FW			0.000038	0.00001	<0.00001	< 0.000050	< 0.000050	< 0.000050	<0.00001	<0.00001	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00004	<0.00001	< 0.000050	< 0.000050
Thorium-232									-			-	-	-	-		-	-	-	-	-		-	-
Tin	**2.5**								<0.005	0.00006	0.00006	< 0.0050	< 0.0050	< 0.0050	<0.005	<0.00005	< 0.0050	< 0.0050	< 0.0050	< 0.0050	<0.02	<0.00005	< 0.0050	< 0.0050
Titanium			1		0.1	FW			<0.005	0.0052	0.006	< 0.0050	< 0.0050	< 0.0050	<0.005	0.0028	< 0.0050	< 0.0050	< 0.0050	< 0.0050	<0.02	0.0022	< 0.0050	< 0.0050
Uranium	**0.02**		0.085		0.01	IG	0.02		<0.0001	0.00001	0.00001	< 0.00010	< 0.00010	< 0.00010	<0.0001	<0.00001	0.0008	0.00056	< 0.00010	< 0.00010	<0.0004	<0.00001	0.0009	< 0.00010
Vanadium	**0.02**				0.1	IG/L			<0.005	<0.0005	<0.0005	< 0.0050	< 0.0050	< 0.0050	<0.005	<0.0005	< 0.0050	< 0.0050	< 0.0050	< 0.0050	<0.02	<0.0005	< 0.0050	< 0.0050
Zinc	**3**		0.075 - 2.4	H	0.03	FW	5	AO	0.009	<0.002	<0.002	0.0174	< 0.0050	< 0.0050	<0.005	0.003	0.0119	< 0.0050	0.0108	0.0091	<0.02	0.006	0.0071	< 0.0050
Zirconium									<0.0005	<0.0001	<0.0001	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.0001	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.002	<0.0001	< 0.00050	< 0.00050
Cesium									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rhenium									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rubidium									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten	**0.003**								-	-	-	-	-		-	-		-			-	-	-	-

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.
Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

H = Hardness-dependant; V= Standard is valence dependent. VI refers to chromium [VI] and III refers to chromium [III]
Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied
AO = Aesthetic Objective; OG = Operational Guideline
Site falls under Schedule 2 G2 activity; CSR iron and manganese standards do not

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate.
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient

Table 18
Results of Groundwater Analyses - Dissolved Metals
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	Notes	BC CSR Standards for Aquatic Life (Freshwater) (Stage 10)	Notes	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19A-10MW-07	K19A-10MW-09	K19A-10MW-10	K19A-10MW-10	K19A-10MW-10	K19A-10MW10	K19-10MW-10	K19-10MW-10	K19A-10MW-19	K19A-10MW-20	K19A-10MW-20	K19A-10MW-21	K19A-10MW-21	K19A-10MW-22	K19A-10MW-24
Sample Control Number									K19A-10MW-07	K19A-10MW-09	DUP-02	K19A-10MW-10	K19A-10MW-10	03375-04	03816-05	03816-06	K19A-10MW-19	K19A-10MW-20	06689-02	K19A-10MW-21	06689-03	K19A-10MW-22	06689-04
Laboratory Report Number									B646703	B646703	B086989	B086989	B646703	B709734	17N242036	17N242036	B648667	B650178	B709775	B650178	B709775	B650178	B709775
Date Sampled									7-Jun-16	7-Jun-16	13-Sep-10	13-Sep-10	8-Jun-16	4-Feb-17	21-Jul-17	21-Jul-17	13-Jun-16	16-Jun-16	5-Feb-17	16-Jun-16	5-Feb-17	16-Jun-16	6-Feb-17
QA/QC											FD	FDA			N	FD							FDA
APEC									1c		1c	1c	1c	1c	1c	1c							
Field Parameters																							
Dissolved Oxygen									0.02	0.01	-	-	1.03	2.37	13.35	13.35	0.62	0.74	3.74	1.22	3.16	1.24	4.64
Conductivity (µS/cm)									637	2228	-	-	230.1	506.2	199	199	988	558.8	1250	622.5	1121	1997	1837
Oxidation Reduction Potential (mV)									-44	-31.7	-	-	38.3	-15.9	47.3	47.3	14.3	36.9	-6.3	8.6	32.9	25.9	48.5
pH (pH units)									6.72	6.72	-	-	6.18	6.55	6.4	6.4	6.41	6.56	7	6.27	6.81	6.26	6.62
Temperature (°C)									8.5	8.2	-	-	7.1	1.8	7.2	7.2	7.6	4.6	1.8	4.2	3	5.1	2.5
Physical Tests																							
Hardness (as CaCO3)									248	395	461	494	420	341	148	149	410	236	301	304	338	505	688
Salinity			15000						25.3	-	-	-	-	16.9			-	-	39.3	-	25.7	36.9	43.9
Anions and Nutrients																							
Chloride	**250**		1500		120		250	AO	17	-	-	-	-	50	-	-	-	-	120	-	16	250	**480**
Dissolved Metals																							
Aluminum	**9.5**				0.5	IG/L	0.1	OG	0.0038	0.0058	0.006	0.0049	0.54	0.0457	0.183	0.159	0.0064	0.0068	0.0042	0.0076	0.006	0.0088	0.0106
Antimony	**0.006**		0.09		2	FW	0.006		< 0.00050	< 0.00050	<0.0005	<0.0005	< 0.00050	<0.0005	<0.0002	<0.0002	< 0.00050	< 0.00050	<0.0005	< 0.00050	<0.0005	< 0.00050	<0.0005
Arsenic	**0.01**		0.05		0.005	FW	0.01		0.0001	0.00034	0.00022	0.00018	0.00118	0.00183	0.0007	0.0005	0.0001	0.0001	0.0001	0.00019	0.00052	0.0001	0.00012
									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barium	**1**		10		2.9	FW	1		0.136	0.446	**4.69**	**4.86**	0.58	**1.79**	0.652	0.664	**1.1**	0.137	0.175	0.173	0.266	0.334	**1.89**
Beryllium	**0.008**		0.0015		0.0053	FW			< 0.00010	< 0.00010	<0.0001	<0.0001	< 0.00010	<0.0001	0.00003	0.00002	< 0.00010	< 0.00010	<0.0001	< 0.00010	<0.0001	< 0.00010	<0.0001
Bismuth									< 0.0010	< 0.0010	<0.001	<0.001	< 0.0010	<0.001	<0.00005	<0.00005	< 0.0010	< 0.0010	<0.001	< 0.0010	<0.001	< 0.0010	<0.001
Boron	**5**		12		0.5	IG	5		0.08	0.121	0.092	0.088	< 0.05	0.054	0.041	0.044	0.178	0.233	0.266	0.18	0.195	0.217	0.168
Cadmium	**0.005**		0.0005 - 0.004	H	0.000017	FW	0.005		< 0.000010	0.000011	0.000068	0.000074	0.00008	<0.00001	0.00008	0.00007	< 0.000010	< 0.000010	0.000032	0.000019	0.000061	0.000042	0.000226
Calcium									91.6	233	119	128	39.3	89.6	39	39.4	112	66.1	82	81	88	117	191
Chromium	**0.05VI/6III**	V	0.01VI/0.09III	V	0.0089	FW	0.05^{VI}	V	< 0.0010	< 0.0010	<0.001	<0.001	< 0.0010	<0.001	<0.0005	<0.0005	< 0.0010	< 0.0010	<0.001	< 0.0010	<0.001	< 0.0010	<0.001
Cobalt	**0.001**		0.04		1	L			< 0.00050	< 0.00050	**0.00321**	**0.00328**	**0.0122**	**0.00924**	**0.0041**	**0.00424**	< 0.00050	< 0.00050	<0.0005	< 0.00050	<0.0005	< 0.00050	**0.00109**
Copper	**1.5**		0.02	H	0.2	IG	1	AO	0.00023	< 0.00020	0.00048	0.00027	0.00787	0.00036	0.0032	0.0032	< 0.00020	< 0.00020	<0.0002	< 0.00020	<0.0002	< 0.00020	<0.0002
Iron	**6.5**				0.3	FW	0.3	AO	2.58	4.7	4.5	4.8	1.47	10.9	1.11	1.07	6.09	3.03	3.42	6.92	7.25	5.33	14.2
Lead	**0.01**		0.04	H	0.1	L	0.01		< 0.00020	0.00032	<0.0002	<0.0002	0.0027	<0.0002	0.0003	0.00032	< 0.00020	< 0.00020	<0.0002	< 0.00020	<0.0002	< 0.00020	<0.0002
Lithium	**0.008**								**0.0449**	**0.09**	**0.0627**	**0.065**	**0.0102**	**0.0329**	**0.0176**	**0.0176**	**0.101**	**0.165**	**0.185**	**0.121**	**0.12**	**0.135**	**0.13**
Magnesium									31.5	74.3	40	42.2	11.8	28.5	12.2	12.2	31.9	17.1	23.5	24.6	28.7	51.5	51.5
Manganese	**1.5**				0.2	IG	0.05	AO	0.219	0.332	0.874	0.908	0.746	1.24	0.343	0.343	1.96	1.01	1.27	1.57	1.87	1.99	5.66
Mercury	**0.001**		0.00025		0.000026	FW	0.001		< 0.000010	< 0.000010	<0.00002	<0.00002	< 0.000010	<0.00001	<0.00001	<0.00001	< 0.000010	< 0.000010	<0.00001	< 0.000010	<0.00001	< 0.000010	<0.00001
Molybdenum	**0.25**		10		0.073	FW			< 0.0010	< 0.0010	<0.001	<0.001	< 0.0010	<0.001	0.00024	0.00026	< 0.0010	< 0.0010	<0.001	< 0.0010	<0.001	< 0.0010	<0.001
Nickel	**0.08**		0.25	H	0.2	IG			< 0.0010	0.0014	0.0098	0.0096	0.0111	0.0125	0.0084	0.0083	< 0.0010	< 0.0010	<0.001	< 0.0010	<0.001	< 0.0010	0.0018
Phosphorus									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium									1.53	3.54	1.65	1.73	4.66	3.79	2.63	2.63	2.09	2.14	2.67	1.91	2.25	2.58	3.42
Selenium	**0.01**		0.02		0.001	FW	0.01		< 0.00010	< 0.00010	0.00012	0.00011	0.00017	0.00012	<0.0005	<0.0005	< 0.00010	< 0.00010	<0.0001	< 0.00010	<0.0001	< 0.00010	<0.0001
Silicon									6.42	6.52	6.19	6.56	4.22	5.87	3.81	3.81	9.3	7.21	7.34	9.02	8.75	8.57	9.33
Silver	**0.02**		0.0005	H	0.0001	FW			< 0.000020	< 0.000020	<0.00002	<0.00002	0.000023	<0.00002	<0.00002	<0.00002	< 0.000020	< 0.000020	<0.00002	< 0.000020	<0.00002	< 0.000020	<0.00002
Sodium	**200**						200	AO	9.93	127	8.43	8.74	3.92	6.66	3.5	3.45	12.9	13.5	15.5	12.3	14.3	14.5	17.3
Strontium	**2.5**								0.256	0.687	0.372	0.385	0.125	0.289	0.121	0.116	1.11	0.468	0.613	0.519	0.666	1.34	1.43
Sulphur									10.7	5.9	<3	<3	< 3.0	<3	1.98	1.95	< 3.0	< 3.0	4.2	< 3.0	5.2	< 3.0	<3
Tellurium									-	-	-	-	-	-			-	-	-	-	-	-	-
Thallium			0.003		0.0008	FW			< 0.000050	< 0.000050	<0.00005	<0.00005	< 0.000050	<0.00001	0.00001	<0.00001	< 0.000050	< 0.000050	<0.00001	< 0.000050	0.000012	< 0.000050	0.000016
Thorium-232									-	-	-	-	-	-			-	-	-	-	-	-	-
Tin	**2.5**								< 0.0050	< 0.0050	<0.005	<0.005	< 0.0050	<0.005	<0.00005	<0.00005	< 0.0050	< 0.0050	<0.005	< 0.0050	<0.005	< 0.0050	<0.005
Titanium			1		0.1	FW			< 0.0050	< 0.0050	<0.005	<0.005	0.0077	<0.005	0.0067	0.0054	< 0.0050	< 0.0050	<0.005	< 0.0050	<0.005	< 0.0050	<0.005
Uranium	**0.02**		0.085		0.01	IG	0.02		< 0.00010	< 0.00010	0.00033	0.00037	0.00035	0.00014	0.00019	0.00018	< 0.00010	< 0.00010	<0.0001	< 0.00010	<0.0001	< 0.00010	0.00012
Vanadium	**0.02**				0.1	IG/L			< 0.0050	< 0.0050	<0.005	<0.005	< 0.0050	<0.005	0.0011	0.0011	< 0.0050	< 0.0050	<0.005	< 0.0050	<0.005	< 0.0050	<0.005
Zinc	**3**		0.075 - 2.4	H	0.03	FW	5	AO	< 0.0050	< 0.0050	0.0169	0.0129	0.0169	0.0148	0.01	0.011	< 0.0050	< 0.0050	<0.005	< 0.0050	<0.005	< 0.0050	<0.005
Zirconium									< 0.00050	< 0.00050	<0.0005	<0.0005	0.00107	0.00066	0.001	0.001	< 0.00050	< 0.00050	<0.0005	< 0.00050	<0.0005	< 0.00050	<0.0005
Cesium									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rhenium									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rubidium									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten	**0.003**								-	-	-	-	-	-	-	-	-		-		-		-

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.
Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

H = Hardness-dependant; V= Standard is valence dependent. VI refers to chromium [VI] and III refers to chromium [III]
Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied
AO = Aesthetic Objective; OG = Operational Guideline
Site falls under Schedule 2 G2 activity; CSR iron and manganese standards do not
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate.
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 18
Results of Groundwater Analyses - Dissolved Metals
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	Notes	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Notes	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19A-10MW-24	K19-10MW-24	K19A-10MW-25	K19A-10MW-26	K19A-10MW-26	K19A-10MW-27	K19A-10MW-28	K19A-10MW-28	K19A-10MW-28	K19B-09MW-02	K19B-09MW-02	K19B-09MW-03	K19B-09MW-04	K19B-09MW-05	K19B-09MW-06
Sample Control Number									06689-05	03816-04	K19A-10MW-25	K19A-10MW-26	K19A-10MW-26	K19A-10MW-27	K19A-10MW-27	MWB	06690-03	K19B-09MW-02	MWF	K19B-09MW-03	K19B-09MW-04	K19B-09MW-05	K19B-09MW-06
Laboratory Report Number									B709775	17N242036	B648291	B086989	B648291	B648291	B646703	B646703	B710365	B650178	B650178	B650178	B650178	B650178	B650178
Date Sampled									6-Feb-17	21-Jul-17	10-Jun-16	13-Sep-10	11-Jun-16	10-Jun-16	9-Jun-16	9-Jun-16	8-Feb-17	19-Jun-16	19-Jun-16	19-Jun-16	19-Jun-16	19-Jun-16	19-Jun-16
QA/QC									FD	N					FDA	FD		FDA	FD				
APEC																							
Field Parameters																							
Dissolved Oxygen									4.64	9.06	1.16	-	5.40	0.96	0.92	0.92	4.12	0.42	0.42	0.46	0.49	7.50	-
Conductivity (µS/cm)									1837	1459	1043	-	206.6	812	2117	2117	2143	467.4	467.4	512.0	463.6	154.9	-
Oxidation Reduction Potential (mV)									48.5	-17.7	-23.6	-	35.1	-43.1	154.3	154.3	-45	-39.6	-39.6	-81.9	-42.4	10.4	-
pH (pH units)									6.62	6.29	6.61	-	6.27	6.75	4.99	4.99	7.25	6.97	6.97	7.29	7.03	6.79	-
Temperature (°C)									2.5	7.2	7.3	-	7.9	6.8	6.3	6.3	3.2	9.4	9.4	7.2	9.9	5.8	-
Physical Tests																							
Hardness (as CaCO3)									700	574	486	68.6	79.9	355	739	707	569	170	171	118	121	93.7	171
Salinity			15000						46.7		25.1	-	-	-	27.4	26.9	26.3	-	-	-	-	-	-
Anions and Nutrients																							
Chloride	250		1500		120		250	AO	**480**	**414**	140	-	-	-	150	160	140	-	-	-	-	-	-
Dissolved Metals																							
Aluminum	9.5				0.5	IG/L	0.1	OG	0.0105	0.002	0.0084	0.0994	0.0619	0.0071	6.37	6.34	0.0953	0.0051	0.0054	0.0046	0.0036	0.0177	0.0031
Antimony	0.006		0.09		2	FW	0.006		<0.0005	<0.0002	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Arsenic	0.01		0.05		0.005	FW	0.01		0.00012	0.0001	0.0027	0.00076	0.00044	0.00094	0.00561	0.00567	0.00781	0.0001	0.0001	0.002	0.0001	0.00012	0.00075
									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barium	1		10		2.9	FW	1		**1.95**	**1.32**	0.855	0.157	0.0811	**6.7**	0.0193	0.0183	0.0418	0.617	0.635	0.81	**1.08**	0.115	0.0989
Beryllium	0.008		0.0015		0.0053	FW			<0.0001	0.00002	< 0.00010	<0.0001	< 0.00010	< 0.00010	0.00136	0.00127	<0.0001	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010
Bismuth									<0.001	<0.00005	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Boron	5		12		0.5	IG	5		0.137	0.132	0.052	<0.05	< 0.05	0.101	0.103	0.101	0.101	0.246	0.245	0.291	0.19	< 0.05	0.151
Cadmium	0.005		0.0005 - 0.004	H	0.000017	FW	0.005		0.000182	0.00002	< 0.000010	0.000136	0.000237	< 0.000010	0.000463	0.000474	0.000055	< 0.000010	< 0.000010	< 0.000010	< 0.000010	0.000019	0.00002
Calcium									191	162	120	16.7	19.1	91.6	212	204	150	41.4	41.2	23.2	29.7	29.2	42.1
Chromium	0.05VI/6III	V	0.01VI/0.09III	V	0.0089	FW	0.05[VI]	V	<0.001	<0.0005	< 0.0010	<0.001	< 0.0010	< 0.0010	0.0017	0.0016	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Cobalt	0.001		0.04		1	L			0.00084	0.00049	**0.00103**	**0.00381**	**0.00176**	**0.00142**	**0.0484**	**0.0494**	**0.00725**	< 0.00050	< 0.00050	**0.00101**	< 0.00050	< 0.00050	0.00074
Copper	1.5		0.02	H	0.2	IG	1	AO	<0.0002	<0.0002	< 0.00020	0.00424	0.0114	< 0.00020	0.00168	0.00154	0.00047	0.0002	< 0.00020	< 0.00020	< 0.00020	0.00122	< 0.00020
Iron	6.5				0.3	FW	0.3	AO	14.5	17.6	15.9	1.65	0.0752	5.75	147	143	60.6	1.63	1.64	2.92	0.896	0.0211	1.05
Lead	0.01		0.04	H	0.1	L	0.01		<0.0002	<0.00005	< 0.00020	<0.0002	0.0002	< 0.00020	0.00191	0.00178	<0.0002	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020
Lithium	0.008								**0.128**	**0.134**	**0.0569**	**0.0159**	**0.0146**	**0.0813**	**0.116**	**0.123**	**0.0693**	**0.151**	**0.166**	**0.153**	**0.11**	0.0063	**0.0792**
Magnesium									54.3	41.2	45.1	6.52	7.82	30.7	50.8	47.9	47.2	16.2	16.5	14.6	11.2	5.02	15.9
Manganese	1.5				0.2	IG	0.05	AO	5.45	4.74	0.686	0.253	0.155	1.63	1.73	1.68	1.93	0.363	0.364	0.375	0.26	0.0076	0.233
Mercury	0.001		0.00025		0.000026	FW	0.001		<0.00001	<0.00001	< 0.000010	<0.00002	< 0.000010	< 0.000010	< 0.000010	< 0.000010	<0.00001	< 0.000010	< 0.000010	< 0.000010	< 0.000010	< 0.000010	< 0.000010
Molybdenum	0.25		10		0.073	FW			<0.001	<0.00005	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Nickel	0.08		0.25	H	0.2	IG			0.0014	0.0009	0.0029	0.013	0.0123	0.0022	**0.164**	**0.167**	0.029	< 0.0010	< 0.0010	0.001	< 0.0010	0.002	0.0011
Phosphorus									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium									3.16	2.64	1.11	0.696	0.811	1.62	1.68	1.66	1.81	1.8	1.82	1.86	1.57	0.445	1.16
Selenium	0.01		0.02		0.001	FW	0.01		<0.0001	<0.0005	0.00018	0.00014	0.00014	< 0.00010	0.00015	0.00014	0.00014	< 0.00010	< 0.00010	< 0.00010	< 0.00010	0.00013	< 0.00010
Silicon									9.19	7.43	6.04	5.17	4.41	6.64	17.4	16.5	11.2	4.17	4.17	4.47	4.26	2.98	4.34
Silver	0.02		0.0005	H	0.0001	FW			<0.00002	<0.00002	< 0.000020	0.000064	< 0.000020	< 0.000020	< 0.000020	< 0.000020	<0.00002	< 0.000020	< 0.000020	< 0.000020	< 0.000020	< 0.000020	< 0.000020
Sodium	200						200	AO	18.4	14.7	9.89	9.32	10.7	16	10.8	10.6	10.4	63	60.2	95	80.9	3.69	27.9
Strontium	2.5								1.44	1.46	0.437	0.0577	0.0554	0.461	0.35	0.359	0.284	0.445	0.438	0.551	0.383	0.0801	0.205
Sulphur									<3	2.63	3.8	10.4	8.9	< 3.0	277	257	103	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	3.9
Tellurium									-		-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium			0.003		0.0008	FW			0.000013	<0.00001	< 0.000050	<0.000005	< 0.000050	< 0.000050	0.000358	0.000358	0.000071	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050
Thorium-232									-		-	-	-	-	-	-	-	-	-	-	-	-	-
Tin	2.5								<0.005	<0.00005	< 0.0050	<0.005	< 0.0050	< 0.0050	< 0.0050	< 0.0050	<0.005	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Titanium			1		0.1	FW			<0.005	0.0018	< 0.0050	<0.005	< 0.0050	< 0.0050	< 0.0050	< 0.0050	<0.005	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Uranium	0.02		0.085		0.01	IG	0.02		<0.0001	0.00001	0.00224	0.00014	< 0.00010	< 0.00010	0.00102	0.00096	0.0019	< 0.00010	< 0.00010	< 0.00010	< 0.00010	0.00012	0.00012
Vanadium	0.02				0.1	IG/L			<0.005	<0.0005	< 0.0050	<0.005	< 0.0050	< 0.0050	< 0.0050	< 0.0050	<0.005	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Zinc	3		0.075 - 2.4	H	0.03	FW	5	AO	<0.005	0.002	0.0051	0.0123	0.0091	0.0079	0.255	0.247	0.0134	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.005	0.0052
Zirconium									<0.0005	<0.0001	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Cesium									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rhenium									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rubidium									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten	0.003								-	-	-	-	-	-	-	-	-						

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.
Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

H = Hardness-dependant; V= Standard is valence dependent. VI refers to chromium [VI] and III refers to chromium [III]
Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied
AO = Aesthetic Objective; OG = Operational Guideline
Site falls under Schedule 2 G2 activity; CSR iron and manganese standards do not

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate.
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient

Table 18
Results of Groundwater Analyses - Dissolved Metals
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	Notes	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Notes	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19B-09MW-07	K19B-09MW-07	K19B-10MW-12	K19B-10MW-13	K19B-10MW-14	K19B-10MW-15	K19B-10MW-15	K19B-10MW-15	K19B-10MW-16	K19B-10MW-18	K19-MW16-01D	K19-MW16-01D	K19-MW16-01D	K19-MW16-01D	K19-MW16-03S
Sample Control Number									K19B-09MW-07	K19B-09MW-07	K19B-10MW-12	K19B-10MW-13	K19B-10MW-14	K19B-10MW-15	MWC	03797-01	K19B-10MW-16	K19B-10MW-18	K19-MW16-01D	K19-MW16-01D	06690-06	3809-03	K19-MW16-03S
Laboratory Report Number									B083804	B646703	B650178	B650178	B650178	B646703	B646703	17N243826	B646703	B646703	B619935	B650178	B710365	17N238668	B650178
Date Sampled									9-Sep-10	9-Jun-16	19-Jun-16	19-Jun-16	19-Jun-16	9-Jun-16	9-Jun-16	26-Jul-17	9-Jun-16	9-Jun-16	11-Mar-16	17-Jun-16	8-Feb-17	15-Jul-17	17-Jun-16
QA/QC														FDA	FD	N						N	
APEC														3a, 13, 15	3a, 13, 15	3a, 13, 15			1c (d-g)	1c (d-g)	1c (d-g)	1c (d-g)	1b
Field Parameters																							
Dissolved Oxygen									-	0.93	1.65	0.42	0.54	0.55	0.55	0.36	0.62	0.62	0.75	0.89	1.63	3.46	1.24
Conductivity (µS/cm)									-	449.9	642.5	505.1	469.0	452.8	452.8	415.1	475.0	451.9	256.3	692	1001	1094	2645
Oxidation Reduction Potential (mV)									-	-10.9	-166.4	-39.3	-29.2	-19.5	-19.5	-49.9	83	-28.6	-9.9	-8.9	-28.5	-45.6	360
pH (pH units)									-	667	7.00	7.17	7.03	6.78	6.78	6.63	6.74	6.72	6.63	6.39	6.73	6.49	6.12
Temperature (°C)									-	8.0	3.0	7.2	8.3	8.1	8.1	6.3	6.5	7.0	3.0	8.1	3	6.7	6.7
Physical Tests																							
Hardness (as CaCO3)									181	-	95.4	46.9	91	-	184	159	163	167	278	280	287	294	1000
Salinity			15000						-	2.28	-	-	-	2.61	-		-	-	-	-	20.3		179
Anions and Nutrients																							
Chloride	**250**		1500		120		250	AO	-	1.4	-	-	-	1.6	-	1.97	-	-	-	-	53	22.3	**630**
Dissolved Metals																							
Aluminum	**9.5**				0.5	IG/L	0.1	OG	0.0292	0.0113	0.0048	0.0047	0.0047	0.0107	0.0064	<0.002	0.0057	0.0135	0.0132	0.009	0.0097	0.003	0.0201
Antimony	**0.006**		0.09		2	FW	0.006		<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0002	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.0002	0.00063
Arsenic	**0.01**		0.05		0.005	FW	0.01		0.00225	0.00311	0.0001	0.00054	0.0004	0.00186	0.00188	0.0025	0.0017	0.00155	0.00056	0.00053	0.00067	0.0032	0.00073
									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barium	**1**		10		2.9	FW	1		0.0768	0.0797	0.222	0.631	**1.92**	0.0871	0.0886	0.111	0.0909	0.413	**1.37**	**2.23**	**2.31**	**2.23**	0.315
Beryllium	**0.008**		0.0015		0.0053	FW			<0.0001	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	<0.00001	< 0.00010	< 0.00010	< 0.00010	< 0.00010	<0.0001	<0.00001	< 0.00010
Bismuth									<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.00005	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.00005	< 0.0010
Boron	**5**		12		0.5	IG	5		0.209	0.226	0.242	0.261	0.208	0.308	0.281	0.216	0.256	0.263	0.099	0.092	0.089	0.082	0.148
Cadmium	**0.005**		0.0005 - 0.004	H	0.000017	FW	0.005		0.00007	< 0.000010	0.000012	< 0.000010	< 0.000010	0.000019	0.000019	<0.00001	0.000039	< 0.000010	0.000076	< 0.000010	<0.00001	<0.00001	0.00139
Calcium									45.3	46.1	21	9.57	20	39.9	40.5	37.6	45	39.5	69.9	67.6	70.1	71.6	279
Chromium	**0.05VI/6III**	V	0.01VI/0.09III	V	0.0089	FW	0.05^{VI}	V	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.0005	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.0005	0.001
Cobalt	**0.001**		0.04		1	L			0.00096	< 0.00050	< 0.00050	**0.00106**	0.00069	< 0.00050	< 0.00050	<0.00005	< 0.00050	< 0.00050	**0.00654**	**0.00145**	<0.0005	0.00073	**0.0615**
Copper	**1.5**		0.02	H	0.2	IG	1	AO	0.00082	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	0.00034	<0.0002	< 0.00020	< 0.00020	< 0.00020	< 0.00020	0.00038	0.0003	0.00255
Iron	**6.5**				0.3	FW	0.3	AO	2.31	4.27	0.157	0.879	1.57	3.34	3.35	3.36	2.56	5.96	6.55	10.9	14.3	23.4	2.35
Lead	**0.01**		0.04	H	0.1	L	0.01		<0.0002	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	<0.00005	0.00062	< 0.00020	< 0.00020	< 0.00020	<0.0002	<0.00005	< 0.00020
Lithium	**0.008**								**0.107**	**0.104**	**0.132**	**0.161**	**0.119**	**0.13**	**0.134**	**0.135**	**0.128**	**0.115**	**0.0676**	**0.0699**	**0.056**	**0.0604**	**0.109**
Magnesium									16.5	16.7	10.4	5.58	9.95	15.5	16.1	15.9	16.9	15.2	25.1	27.1	27.2	27.9	74.9
Manganese	**1.5**				0.2	IG	0.05	AO	0.732	0.986	0.277	0.3	0.341	0.685	0.699	0.678	0.909	0.703	0.195	0.122	0.117	0.092	1.76
Mercury	**0.001**		0.00025		0.000026	FW	0.001		<0.00002	< 0.000010	< 0.000010	< 0.000010	< 0.000010	< 0.000010	< 0.000010	<0.00001	< 0.000010	< 0.000010	0.000012	< 0.000010	<0.00001	<0.00001	< 0.000010
Molybdenum	**0.25**		10		0.073	FW			<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	0.00044	< 0.0010	< 0.0010	0.0013	< 0.0010	<0.001	0.00204	0.003
Nickel	**0.08**		0.25	H	0.2	IG			0.0018	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.0002	< 0.0010	< 0.0010	0.0119	0.0036	0.0023	0.0027	**0.135**
Phosphorus									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium									1.29	1.17	1.48	1.32	1.56	1.25	1.27	1.26	1.33	1.34	2.1	1.71	1.95	1.93	6.33
Selenium	**0.01**		0.02		0.001	FW	0.01		<0.0001	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	<0.0005	< 0.00010	< 0.00010	0.00071	< 0.00010	<0.0001	0.0005	**0.0152**
Silicon									5.17	5.97	4.07	4.09	4.08	4.9	5.04	3.61	5.37	5.48	6.35	6.77	7.25	5.12	6.98
Silver	**0.02**		0.0005	H	0.0001	FW			<0.00002	< 0.000020	< 0.000020	< 0.000020	< 0.000020	< 0.000020	< 0.000020	<0.00002	< 0.000020	< 0.000020	< 0.000020	< 0.000020	<0.00002	<0.00002	0.00014
Sodium	**200**						200	AO	24.9	25.4	101	134	98.4	36.1	35.5	43.3	36	35.8	7.8	7.97	7.99	6.81	70.4
Strontium	**2.5**								0.302	0.313	0.314	0.242	0.419	0.356	0.34	0.509	0.366	0.345	0.291	0.304	0.294	0.374	0.978
Sulphur									6.6	4.3	< 3.0	< 3.0	< 3.0	3.8	4.3	4.13	5.9	3	5	< 3.0	<3	1.59	54.4
Tellurium									-	-	-	-	-	-	-		-	-	-	-	-		-
Thallium			0.003		0.0008	FW			<0.00005	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00001	<0.00001	< 0.000050
Thorium-232									-	-	-	-	-	-	-		-	-	-	-	-		-
Tin	**2.5**								<0.005	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	<0.00005	< 0.0050	< 0.0050	< 0.0050	< 0.0050	<0.005	<0.00005	< 0.0050
Titanium			1		0.1	FW			<0.005	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.0012	< 0.0050	< 0.0050	< 0.0050	< 0.0050	<0.005	0.003	< 0.0050
Uranium	**0.02**		0.085		0.01	IG	0.02		0.00013	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	0.00001	< 0.00010	< 0.00010	0.00047	0.00012	<0.0001	0.00008	0.0153
Vanadium	**0.02**				0.1	IG/L			<0.005	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	<0.0005	< 0.0050	< 0.0050	< 0.0050	< 0.0050	<0.005	<0.0005	< 0.0050
Zinc	**3**		0.075 - 2.4	H	0.03	FW	5	AO	0.0115	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.007	< 0.0050	< 0.0050	0.0076	0.0054	<0.005	0.005	0.0654
Zirconium									<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0001	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.0001	< 0.00050
Cesium									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rhenium									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rubidium									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten	**0.003**								-	-				-	-	-	-	-	-		-	-	

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.
Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.
B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)
Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.
H = Hardness-dependant; V= Standard is valence dependent. VI refers to chromium [VI] and III refers to chromium [III]
Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied
AO = Aesthetic Objective; OG = Operational Guideline
Site falls under Schedule 2 G2 activity; CSR iron and manganese standards do not
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate.
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 18
Results of Groundwater Analyses - Dissolved Metals
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	Notes	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Notes	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19-MW16-03D	K19-MW16-03D	K19-MW16-03D	K19-MW16-03D	K19-MW16-04	K19-MW16-04	K19-MW16-05	K19-MW16-05	K19-MW16-06	K19-MW16-06	K19-MW16-07S	K19-MW16-07S	K19-MW16-07D	K19-MW16-07D	K19-MW16-07D	K19-MW16-07D
Sample Control Number									K19-MW16-03D	K19-MW16-03D	03375-03	3808-05	K19-MW16-04	K19-MW16-04	K19-MW16-05	03816-02	K19-MW16-06	K19-MW16-06	K19-MW16-07S	03797-07	K19-MW16-07D	K19-MW16-07D	03815-03	03815-04
Laboratory Report Number									B620736	B650178	B709734	17N238668	B620736	B650178	B650178	17N242036	B620736	B648291	B650178	17N243826	B620736	B650178	17N242036	17N242036
Date Sampled									15-Mar-16	17-Jun-16	4-Feb-17	14-Jul-17	15-Mar-16	16-Jun-16	18-Jun-16	21-Jul-17	14-Mar-16	10-Jun-16	19-Jun-16	26-Jul-17	14-Mar-16	18-Jun-16	20-Jul-17	20-Jul-17
QA/QC												N				N				N			N	FD
APEC									1b	1b	1b	1b			1c	1c			backgrnd	backgrnd	backgrnd	backgrnd	backgrnd	backgrnd
Field Parameters																								
Dissolved Oxygen									2.02	1.36	2.46	2.54	4.87	1.12	1.01	1.12	1.88	0.83	2.65	6.86	0.40	0.45	0.28	0.28
Conductivity (µS/cm)									117.5	1081	935	1204	1161	1011	1960	961	784.3	517.1	1007	661	904	813	672.5	672.5
Oxidation Reduction Potential (mV)									-0.7	12.6	-30	-75.1	-3.8	-17.6	-83.1	-25.4	9.4	-2.2	26.9	27.3	-47.6	-128.0	-49.7	-49.7
pH (pH units)									6.59	6.53	6.79	6.77	6.72	6.53	7.43	6.4	6.73	6.65	6.62	6.79	7.86	7.58	7.41	7.41
Temperature (°C)									14.5	6.9	3.8	6.8	3.0	4.7	7.4	7.3	4.2	10.1	9.7	13.1	3.8	7.9	5.8	5.8
Physical Tests																								
Hardness (as CaCO3)									501	469	467	439	491	521	1020	458	365	182	380	380	40.4	21.8	19	18.9
Salinity			15000						-	-	54.2		-	-	-		-	-	-		-	-		
Anions and Nutrients																								
Chloride	**250**		1500		120		250	AO	-	-	100	106	-	-	-	-	-	-	-	2.18	-	-	0.45	0.45
Dissolved Metals																								
Aluminum	**9.5**				0.5	IG/L	0.1	OG	0.0135	0.0051	0.004	<0.002	0.0127	0.0071	0.0835	0.189	0.0143	0.0072	0.0109	0.008	0.0125	0.0036	<0.002	<0.002
Antimony	**0.006**		0.09		2	FW	0.006		< 0.00050	< 0.00050	<0.0005	<0.0002	< 0.00050	< 0.00050	0.00057	<0.0002	0.00065	< 0.00050	< 0.00050	0.0002	0.00151	< 0.00050	<0.0002	<0.0002
Arsenic	**0.01**		0.05		0.005	FW	0.01		0.00053	0.00013	0.00013	0.0001	0.00113	0.00023	0.00047	0.0056	0.00122	0.00051	0.00091	0.0004	0.00113	0.00024	0.0001	0.0002
									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barium	**1**		10		2.9	FW	1		**12.6**	**12.3**	**11.4**	**10.3**	**1.08**	**2.01**	0.0425	0.0852	**4.04**	**3.67**	0.0511	0.0461	0.317	0.195	0.196	0.194
Beryllium	**0.008**		0.0015		0.0053	FW			< 0.00010	< 0.00010	<0.0001	<0.00001	< 0.00010	< 0.00010	< 0.00010	0.00013	< 0.00010	< 0.00010	< 0.00010	<0.00001	< 0.00010	< 0.00010	<0.00001	<0.00001
Bismuth									< 0.0010	< 0.0010	<0.001	<0.00005	< 0.0010	< 0.0010	< 0.0010	<0.00005	< 0.0010	< 0.0010	< 0.0010	<0.00005	< 0.0010	< 0.0010	<0.00005	<0.00005
Boron	**5**		12		0.5	IG	5		0.149	0.158	0.164	0.126	0.072	0.07	0.131	0.097	0.105	0.109	0.14	0.119	0.328	0.493	0.527	0.536
Cadmium	**0.005**		0.0005 - 0.004	H	0.000017	FW	0.005		0.000048	< 0.000010	<0.00001	<0.00001	0.000096	0.000042	0.000588	0.00004	0.000069	< 0.000010	0.000192	0.00013	< 0.000010	< 0.000010	<0.00001	<0.00001
Calcium									133	124	126	118	131	138	269	119	97.7	66.3	101	97.4	6.78	3.73	3.1	3.06
Chromium	**0.05VI/6III**	V	0.01VI/0.09III	V	0.0089	FW	0.05[VI]	V	< 0.0010	< 0.0010	<0.001	<0.0005	< 0.0010	< 0.0010	< 0.0010	<0.0005	< 0.0010	< 0.0010	< 0.0010	<0.0005	< 0.0010	< 0.0010	<0.0005	<0.0005
Cobalt	**0.001**		0.04		1	L			**0.00177**	< 0.00050	<0.0005	<0.00005	**0.00389**	0.00097	**0.122**	0.00074	**0.00372**	< 0.00050	**0.00622**	**0.00535**	< 0.00050	< 0.00050	<0.00005	<0.00005
Copper	**1.5**		0.02	H	0.2	IG	1	AO	< 0.00020	< 0.00020	<0.0002	<0.0002	0.00051	< 0.00020	0.00242	<0.0002	0.00038	0.0023	0.001	0.0003	0.00038	< 0.00020	<0.0002	<0.0002
Iron	**6.5**				0.3	FW	0.3	AO	4.46	4.77	4.27	4.98	5.5	9.76	19.2	47.7	0.423	0.887	0.0229	0.064	0.0067	0.0931	0.107	0.105
Lead	**0.01**		0.04	H	0.1	L	0.01		< 0.00020	< 0.00020	<0.0002	<0.00005	< 0.00020	< 0.00020	< 0.00020	<0.00005	< 0.00020	< 0.00020	< 0.00020	<0.00005	< 0.00020	< 0.00020	<0.00005	<0.00005
Lithium	**0.008**								**0.0886**	**0.0866**	**0.0854**	**0.0762**	**0.0616**	**0.0592**	**0.114**	**0.0843**	**0.0595**	**0.0435**	**0.0814**	**0.0738**	**0.209**	**0.198**	**0.184**	**0.191**
Magnesium									41.2	38.5	36.9	35	39.8	43.1	84.2	39	29.5	19.9	31.3	33.1	5.7	3.04	2.74	2.74
Manganese	**1.5**				0.2	IG	0.05	AO	0.695	0.618	0.587	0.493	0.91	0.784	3.35	1.18	1.11	0.856	0.597	0.667	0.0391	0.0329	0.033	0.033
Mercury	**0.001**		0.00025		0.000026	FW	0.001		< 0.000010	< 0.000010	<0.00001	0.00001	< 0.000010	< 0.000010	< 0.000010	<0.00001	< 0.000010	< 0.000010	< 0.000010	<0.00001	< 0.000010	< 0.000010	<0.00001	<0.00001
Molybdenum	**0.25**		10		0.073	FW			< 0.0010	< 0.0010	<0.001	<0.00005	0.0011	< 0.0010	0.0011	0.00065	0.0011	< 0.0010	0.001	0.00092	0.0066	< 0.0010	<0.00005	<0.00005
Nickel	**0.08**		0.25	H	0.2	IG			0.0033	< 0.0010	<0.001	<0.0002	0.0084	0.0027	**0.266**	0.0067	0.0083	< 0.0010	0.0165	0.0109	< 0.0010	< 0.0010	<0.0002	<0.0002
Phosphorus									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium									2.51	2.18	2.28	2.09	2.25	1.42	3.41	1.95	2.06	1.15	3.26	2.59	1.27	0.849	0.768	0.751
Selenium	**0.01**		0.02		0.001	FW	0.01		0.00022	< 0.00010	<0.0001	0.0006	0.00062	0.00028	0.00065	<0.0005	0.00044	< 0.00010	0.00067	0.0014	0.0008	< 0.00010	<0.0005	<0.0005
Silicon									5.68	6.24	7.29	4.95	5.64	6.7	10.5	8.65	5.97	7.14	5.75	3.87	1.91	3.78	3.25	3.29
Silver	**0.02**		0.0005	H	0.0001	FW			< 0.000020	< 0.000020	<0.00002	<0.00002	< 0.000020	< 0.000020	0.00224	<0.00002	< 0.000020	< 0.000020	< 0.000020	<0.00002	< 0.000020	< 0.000020	<0.00002	<0.00002
Sodium	**200**						200	AO	18.7	18	21.3	20.8	42.6	10.6	25.4	19.1	19.6	9.25	15.3	16.3	**220**	179	173	173
Strontium	**2.5**								0.99	0.862	0.947	0.939	0.493	0.478	0.486	0.32	0.436	0.265	0.29	0.389	0.194	0.103	0.0917	0.0958
Sulphur									< 3.0	< 3.0	<3	2.99	10.7	< 3.0	352	102	4.8	< 3.0	35.7	47.5	< 3.0	< 3.0	<0.5	<0.5
Tellurium									-	-	-		-	-	-		-	-	-		-	-		
Thallium			0.003		0.0008	FW			< 0.000050	< 0.000050	<0.00001	<0.00001	< 0.000050	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	<0.00001	<0.00001
Thorium-232									-	-	-		-	-	-		-	-	-		-	-		
Tin	**2.5**								< 0.0050	< 0.0050	<0.005	<0.00005	< 0.0050	< 0.0050	< 0.0050	<0.00005	< 0.0050	< 0.0050	< 0.0050	<0.00005	< 0.0050	< 0.0050	<0.00005	<0.00005
Titanium			1		0.1	FW			< 0.0050	< 0.0050	<0.005	0.0023	< 0.0050	< 0.0050	< 0.0050	0.0016	< 0.0050	< 0.0050	< 0.0050	0.0009	< 0.0050	< 0.0050	0.0014	0.0014
Uranium	**0.02**		0.085		0.01	IG	0.02		0.00017	< 0.00010	<0.0001	<0.00001	0.00405	0.00111	0.00116	0.00082	0.00106	< 0.00010	0.00308	0.00183	0.00076	0.00021	<0.00001	<0.00001
Vanadium	**0.02**				0.1	IG/L			< 0.0050	< 0.0050	<0.005	<0.0005	< 0.0050	< 0.0050	< 0.0050	<0.0005	< 0.0050	< 0.0050	< 0.0050	0.0005	< 0.0050	< 0.0050	<0.0005	<0.0005
Zinc	**3**		0.075 - 2.4	H	0.03	FW	5	AO	0.0127	0.0132	0.0072	0.006	< 0.0050	< 0.0050	1.09	0.101	0.0084	0.0065	0.0073	0.002	< 0.0050	< 0.0050	<0.002	<0.002
Zirconium									< 0.00050	< 0.00050	<0.0005	<0.0001	< 0.00050	< 0.00050	< 0.00050	<0.0001	< 0.00050	< 0.00050	< 0.00050	0.0002	< 0.00050	< 0.00050	<0.0001	<0.0001
Cesium									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rhenium									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rubidium									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten	**0.003**								-		-	-	-			-	-	-		-	-	-	-	-

Notes:

All parameter units in milligrams per litre (mg/L), unless otherwise noted.

Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

H = Hardness-dependant; V= Standard is valence dependent. VI refers to chromium [VI] and III refers to chromium [III]

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied

AO = Aesthetic Objective; OG = Operational Guideline

Site falls under Schedule 2 G2 activity; CSR iron and manganese standards do not	**2.5** Exceeds CSR DW standard
QA/QC = Quality Assurance/Quality Control	1 Exceeds CSR AW-F standard
FDA = Field Duplicate Available; FD = Field Duplicate.	0.1 Exceeds FIGQ AL standard
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed	200 Exceeds CDWQ standard

Italics - indicates that the detection limit exceeds one or more criteria.

APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient

Table 18
Results of Groundwater Analyses - Dissolved Metals
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	Notes	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Notes	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19-MW16-08	K19-MW16-08	K19-MW16-08	K19-MW16-08	K19-MW16-09	K19-MW16-09	K19-MW16-10S	K19-MW16-10S	K19-MW16-10S	K19-MW16-10D	K19-MW16-10D	K19-MW16-10D	K19-MW16-11	K19-MW16-11
Sample Control Number									K19-MW16-08	K19-MW16-08-DUP	K19-MW16-08	MWD	K19-MW16-09	06689-01	K19-MW16-10S	K19-MW16-10S	3808-02	K19-MW16-10D	K19-MW16-10D	3808-01	K19-MW16-11	K19-MW16-11
Laboratory Report Number									B620736	B620736	B650178	B650178	B650178	B709775	B621590	B650178	17N238668	B620736	B650178	17N238668	B621590	B650178
Date Sampled									15-Mar-16	15-Mar-16	16-Jun-16	16-Jun-16	18-Jun-16	5-Feb-17	18-Mar-16	17-Jun-16	13-Jul-17	15-Mar-16	17-Jun-16	13-Jul-17	16-Mar-16	19-Jun-16
QA/QC									FDA	FD	FDA	FD					N			N		
APEC															2b (d-g)	2b (d-g)	2b (d-g)	2b (d-g)	2b (d-g)	2b (d-g)		
Field Parameters																						
Dissolved Oxygen									0.88	0.88	1.08	1.08	5.74	2.84	5.00	1.54	7.05	0.52	0.95	1.42	0.68	0.68
Conductivity (µS/cm)									631.5	631.5	527.9	527.9	3777	2740	332.5	1417	405.7	545.3	573.6	658.8	470.0	399.7
Oxidation Reduction Potential (mV)									20.0	20.0	23.5	23.5	-75.9	15.4	40	1.2	-12.9	22.2	-7.3	-15.2	13.8	-28.4
pH (pH units)									6.65	6.65	6.43	6.43	6.69	6.84	6.55	6.41	6.69	6.91	6.70	7.07	6.67	659
Temperature (°C)									4.7	4.7	4.8	4.8	10.0	2.3	4.8	6.7	4.9	4.0	5.1	5.2	4.0	9.9
Physical Tests																						
Hardness (as CaCO3)									303	295	255	257	1220	591	166	298	179	239	243	250	195	192
Salinity			15000						-	-	-	-	144	37.2	-	-		-	-		-	2.14
Anions and Nutrients																						
Chloride	**250**		1500		120		250	AO	-	-	-	-	87	23	-	-	40.7	-	-	18.9	-	1.3
Dissolved Metals																						
Aluminum	**9.5**				0.5	IG/L	0.1	OG	0.0129	0.0119	0.0056	0.0051	0.14	0.0483	0.0718	0.103	0.003	0.0164	0.008	<0.002	0.0143	0.0082
Antimony	**0.006**		0.09		2	FW	0.006		< 0.00050	< 0.00050	< 0.00050	< 0.00050	0.00066	<0.0005	< 0.00050	< 0.00050	0.0005	< 0.00050	< 0.00050	<0.0002	< 0.00050	< 0.00050
Arsenic	**0.01**		0.05		0.005	FW	0.01		0.00098	0.00091	0.00035	0.00033	0.00275	0.00499	0.00204	0.00367	0.0062	0.0009	0.00082	0.0005	0.00543	0.00285
									0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barium	**1**		10		2.9	FW	1		0.0639	0.0603	0.0617	0.0606	0.0533	0.0363	0.178	0.0707	0.0825	**6.92**	**9.71**	**11.2**	0.0986	0.0805
Beryllium	**0.008**		0.0015		0.0053	FW			< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	<0.0001	< 0.00010	< 0.00010	<0.00001	< 0.00010	< 0.00010	<0.00001	< 0.00010	< 0.00010
Bismuth									< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.00005	< 0.0010	< 0.0010	<0.00005	< 0.0010	< 0.0010
Boron	**5**		12		0.5	IG	5		0.191	0.19	0.218	0.229	0.224	0.293	0.111	0.112	0.082	0.3	0.236	0.26	0.209	0.195
Cadmium	**0.005**		0.0005 - 0.004	H	0.000017	FW	0.005		0.000037	0.000042	0.000018	0.0000016	0.000558	0.000015	0.000219	0.00045	0.00003	0.000057	0.000014	<0.00001	0.000033	< 0.000010
Calcium									76.3	73.4	64.3	64.1	355	168	43.5	77	44.3	51.9	51.8	53.6	48.6	47.9
Chromium	**0.05VI/6III**	V	0.01VI/0.09III	V	0.0089	FW	0.05[VI]	V	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.0005	< 0.0010	< 0.0010	<0.0005	< 0.0010	< 0.0010
Cobalt	**0.001**		0.04		1	L			**0.00152**	**0.00156**	< 0.00050	< 0.00050	**0.0234**	**0.0143**	**0.0107**	**0.0114**	**0.00127**	**0.00396**	**0.00168**	0.00015	**0.00118**	< 0.00050
Copper	**1.5**		0.02	H	0.2	IG	1	AO	< 0.00020	< 0.00020	0.00026	< 0.00020	0.00168	0.00053	0.00101	0.00238	0.0004	0.0003	< 0.00020	0.0002	< 0.00020	< 0.00020
Iron	**6.5**				0.3	FW	0.3	AO	2.27	2.18	2.59	2.61	3.35	9.62	2.75	12.6	18.1	0.474	1.26	0.744	2.91	3.98
Lead	**0.01**		0.04	H	0.1	L	0.01		< 0.00020	< 0.00020	< 0.00020	< 0.00020	0.0004	<0.0002	< 0.00020	0.00056	<0.00005	< 0.00020	< 0.00020	<0.00005	< 0.00020	< 0.00020
Lithium	**0.008**								**0.119**	**0.115**	**0.113**	**0.111**	**0.23**	**0.21**	**0.0762**	**0.088**	**0.0752**	**0.191**	**0.176**	**0.213**	**0.104**	**0.106**
Magnesium									27.3	27.2	22.9	23.5	81.4	41.7	13.9	25.7	16.5	26.5	27.7	28.2	18	17.5
Manganese	**1.5**				0.2	IG	0.05	AO	1.39	1.37	1.15	1.16	5.16	2.69	0.928	2.41	1.64	0.57	0.773	0.676	1.05	1.1
Mercury	**0.001**		0.00025		0.000026	FW	0.001		< 0.000010	< 0.000010	< 0.000010	< 0.000010	< 0.000010	<0.00001	< 0.000010	< 0.000010	<0.00001	< 0.000010	< 0.000010	<0.00001	< 0.000010	< 0.000010
Molybdenum	**0.25**		10		0.073	FW			< 0.0010	< 0.0010	< 0.0010	< 0.0010	0.0025	0.0014	0.0015	0.0018	0.0016	< 0.0010	< 0.0010	0.00006	< 0.0010	< 0.0010
Nickel	**0.08**		0.25	H	0.2	IG			0.0035	0.0034	< 0.0010	< 0.0010	0.0427	0.0283	0.024	0.0216	0.0061	0.0068	0.0032	0.0003	0.0021	< 0.0010
Phosphorus									-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium									2.18	2.16	1.85	1.95	6.53	4.53	2.99	2.51	1.4	2.62	1.8	1.89	1.61	1.21
Selenium	**0.01**		0.02		0.001	FW	0.01		0.00034	0.00019	< 0.00010	< 0.00010	0.0033	0.00036	0.00124	0.00042	<0.0005	0.0004	< 0.00010	0.001	< 0.00010	< 0.00010
Silicon									6.32	6.25	7.86	7.67	6.63	7.74	7.49	7.15	5.61	3.11	3.9	2.39	5.75	5.76
Silver	**0.02**		0.0005	H	0.0001	FW			< 0.000020	< 0.000020	< 0.000020	< 0.000020	0.000051	<0.00002	< 0.000020	0.000181	<0.00002	< 0.000020	< 0.000020	<0.00002	< 0.000020	< 0.000020
Sodium	**200**						200	AO	12.4	12.6	10.8	11.1	**345**	**248**	9.32	159	26.1	19.7	16.8	19.3	29.7	26
Strontium	**2.5**								0.676	0.672	0.562	0.56	1.57	0.9	0.179	0.266	0.157	1.01	1.08	1.36	0.371	0.365
Sulphur									8.7	8.4	6.4	6.1	496	161	7.8	145	9.92	< 3.0	< 3.0	0.63	6.4	4.1
Tellurium									-	-	-	-	-	-	-	-		-	-		-	-
Thallium			0.003		0.0008	FW			< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050
Thorium-232									-	-	-	-	-	-	-	-		-	-		-	-
Tin	**2.5**								< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	<0.005	< 0.0050	< 0.0050	0.00011	< 0.0050	< 0.0050	<0.00005	< 0.0050	< 0.0050
Titanium			1		0.1	FW			< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	<0.005	< 0.0050	< 0.0050	0.0023	< 0.0050	< 0.0050	0.0021	< 0.0050	< 0.0050
Uranium	**0.02**		0.085		0.01	IG	0.02		0.00029	0.00026	< 0.00010	< 0.00010	**0.0298**	0.0174	0.0004	0.00309	0.00118	0.00126	0.00018	0.00003	0.00018	< 0.00010
Vanadium	**0.02**				0.1	IG/L			< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	<0.005	< 0.0050	< 0.0050	0.0005	< 0.0050	< 0.0050	<0.0005	< 0.0050	< 0.0050
Zinc	**3**		0.075 - 2.4	H	0.03	FW	5	AO	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.0324	0.0126	0.01	0.0126	0.003	0.0082	0.0106	0.007	< 0.0050	< 0.0050
Zirconium									< 0.00050	< 0.00050	< 0.00050	< 0.00050	0.0011	0.00168	< 0.00050	0.0005	0.0001	< 0.00050	< 0.00050	<0.0001	< 0.00050	< 0.00050
Cesium									-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum									-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rhenium									-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rubidium									-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten	**0.003**								-	-				-	-		-	-		-	-	

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.
Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.
B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)
Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.
H = Hardness-dependant; V= Standard is valence dependent. VI refers to chromium [VI] and III refers to chromium [III]
Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied
AO = Aesthetic Objective; OG = Operational Guideline
Site falls under Schedule 2 G2 activity; CSR iron and manganese standards do not

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate.
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient

Table 18
Results of Groundwater Analyses - Dissolved Metals
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	Notes	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Notes	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19-MW16-12S	K19-MW16-12S	K19-MW16-12S	K19-MW16-12D	K19-MW16-12D	K19-MW16-12D	K19-MW16-13	K19-MW16-13	K19-MW16-13	K19-MW16-14	K19-MW16-14	K19-MW16-14
Sample Control Number									K19-MW16-12S	K19-MW16-12S	3808-04	K19-MW16-12D	K19-MW16-12D	3808-03	K19-MW16-13	K19-MW16-13-DUP	K19-MW16-13	K19-MW16-14	K19-MW16-14	06690-07
Laboratory Report Number									B621590	B650178	17N238668	B621590	B650178	17N238668	B621590	B621590	B646703	B621590	B650178	B710365
Date Sampled									18-Mar-16	17-Jun-16	13-Jul-17	16-Mar-16	17-Jun-16	13-Jul-17	17-Mar-16	17-Mar-16	8-Jun-16	17-Mar-16	16-Jun-16	9-Feb-17
QA/QC											N			N	FDA	FD				
APEC									K19B (d-g)	K19B (d-g)	K19B (d-g)	K19B (d-g)	K19B (d-g)	K19B (d-g)				1b	1b	1b
Field Parameters																				
Dissolved Oxygen									5.22	6.32	2.63	0.55	1.05	2.12	0.91	0.91	0.88	2.01	1.15	1.85
Conductivity (µS/cm)									299.8	366.0	314.4	309.3	361.0	333.2	811.8	811.8	697.9	848	915	1470
Oxidation Reduction Potential (mV)									33.9	16.9	-14.8	-19.2	-21.4	-22.4	1.8	1.8	-23.5	20.3	-4.7	8.6
pH (pH units)									6.99	6.66	6.61	6.47	6.38	6.61	6.58	6.58	6.52	6.45	6.39	6.67
Temperature (°C)									4.1	6.7	5.6	3.4	5.6	5.8	4.1	4.1	6.4	4.1	5.0	4.1
Physical Tests																				
Hardness (as CaCO3)									114	111	120	122	126	120	441	434	161	397	432	401
Salinity			15000						-	-		-	-		-	-	-	-	-	33.5
Anions and Nutrients																				
Chloride	**250**		1500		120		250	AO	-	-	2.51	-	-	2.26	-	-	-	-	-	110
Dissolved Metals																				
Aluminum	**9.5**				0.5	IG/L	0.1	OG	0.0661	0.0263	0.005	0.0694	0.0067	<0.002	0.0631	0.0639	0.0058	0.0621	0.0084	0.027
Antimony	**0.006**		0.09		2	FW	0.006		< 0.00050	< 0.00050	<0.0002	< 0.00050	< 0.00050	<0.0002	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.002
Arsenic	**0.01**		0.05		0.005	FW	0.01		**0.0112**	0.00279	0.0021	0.0047	0.00251	0.0014	0.00044	0.00046	0.0001	0.00127	0.0004	0.00058
									1	0	0	0	0	0	0	0	0	0	0	0
Barium	**1**		10		2.9	FW	1		0.161	0.097	0.241	0.289	0.301	0.295	**4.37**	**4.54**	**3.71**	**9.39**	**10.2**	**8.89**
Beryllium	**0.008**		0.0015		0.0053	FW			< 0.00010	< 0.00010	<0.00001	< 0.00010	< 0.00010	<0.00001	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	<0.0004
Bismuth									< 0.0010	< 0.0010	<0.00005	< 0.0010	< 0.0010	<0.00005	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.004
Boron	**5**		12		0.5	IG	5		0.109	0.11	0.104	0.115	0.109	0.117	0.115	0.117	0.111	0.162	0.141	<0.2
Cadmium	**0.005**		0.0005 - 0.004	H	0.000017	FW	0.005		0.000094	0.000104	<0.00001	0.000017	< 0.000010	<0.00001	0.000017	0.000017	< 0.000010	0.000097	0.000054	0.000096
Calcium									28.9	26.9	29.7	30.1	30.9	29	117	115	105	103	115	106
Chromium	**0.05VI/6III**	V	0.01VI/0.09III	V	0.0089	FW	0.05^{VI}	V	< 0.0010	< 0.0010	<0.0005	< 0.0010	< 0.0010	<0.0005	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.004
Cobalt	**0.001**		0.04		1	L			**0.00599**	**0.00435**	**0.00281**	**0.00183**	**0.00123**	**0.00106**	< 0.00050	< 0.00050	< 0.00050	**0.00253**	**0.00175**	*<0.002*
Copper	**1.5**		0.02	H	0.2	IG	1	AO	0.00046	< 0.00020	0.0004	< 0.00020	< 0.00020	<0.0002	< 0.00020	< 0.00020	0.00024	0.00021	< 0.00020	0.00089
Iron	**6.5**				0.3	FW	0.3	AO	4.17	4.01	7.76	12.2	14	13.9	4.44	4.53	4.1	6.22	6.89	7.2
Lead	**0.01**		0.04	H	0.1	L	0.01		< 0.00020	< 0.00020	<0.00005	< 0.00020	< 0.00020	<0.00005	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	<0.0008
Lithium	**0.008**								**0.0667**	**0.064**	**0.0634**	**0.0658**	**0.073**	**0.0703**	**0.0666**	**0.0701**	**0.0597**	**0.0813**	**0.076**	**0.071**
Magnesium									10.2	10.6	11.2	11.4	11.9	11.6	36.1	35.5	32.2	34.1	35.3	33.3
Manganese	**1.5**				0.2	IG	0.05	AO	0.653	0.759	0.692	0.543	0.568	0.524	0.55	0.546	0.514	0.742	0.729	0.623
Mercury	**0.001**		0.00025		0.000026	FW	0.001		< 0.000010	< 0.000010	<0.00001	< 0.000010	< 0.000010	<0.00001	< 0.000010	< 0.000010	< 0.000010	< 0.000010	< 0.000010	<0.00001
Molybdenum	**0.25**		10		0.073	FW			< 0.0010	< 0.0010	0.00031	< 0.0010	< 0.0010	0.00024	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.004
Nickel	**0.08**		0.25	H	0.2	IG			0.0116	0.0089	0.0058	0.0041	0.0028	0.0022	< 0.0010	< 0.0010	< 0.0010	0.0059	0.0044	<0.004
Phosphorus									-	-	-	-	-	-	-	-	-	-	-	-
Potassium									1.47	1.11	1.3	1.19	0.967	0.946	1.55	1.52	1.4	2.3	2.09	2.06
Selenium	**0.01**		0.02		0.001	FW	0.01		0.00031	< 0.00010	0.0007	0.00013	< 0.00010	<0.0005	0.00015	< 0.00010	< 0.00010	0.0003	0.00019	<0.0004
Silicon									6.99	6.34	4.7	6.76	6.34	4.86	7.26	7.16	6.89	6.82	7.3	7.55
Silver	**0.02**		0.0005	H	0.0001	FW			< 0.000020	< 0.000020	<0.00002	< 0.000020	< 0.000020	<0.00002	< 0.000020	< 0.000020	< 0.000020	< 0.000020	< 0.000020	<0.00008
Sodium	**200**						200	AO	11.1	21.5	16.7	12.7	15.1	16.1	9.45	9.55	10.3	13.8	13.3	13.2
Strontium	**2.5**								0.134	0.128	0.154	0.18	0.176	0.15	0.38	0.374	0.333	0.635	0.659	0.603
Sulphur									5.9	3.8	2.05	3.3	< 3.0	2.24	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	<12
Tellurium									-	-		-	-		-	-	-	-	-	-
Thallium			0.003		0.0008	FW			< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00004
Thorium-232									-	-		-	-		-	-	-	-	-	-
Tin	**2.5**								< 0.0050	< 0.0050	<0.00005	< 0.0050	< 0.0050	<0.00005	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	<0.02
Titanium			1		0.1	FW			< 0.0050	< 0.0050	0.003	< 0.0050	< 0.0050	0.0038	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	<0.02
Uranium	**0.02**		0.085		0.01	IG	0.02		0.00011	0.00227	0.00049	0.00024	< 0.00010	0.00001	< 0.00010	< 0.00010	< 0.00010	0.00018	0.00018	<0.0004
Vanadium	**0.02**				0.1	IG/L			< 0.0050	< 0.0050	<0.0005	< 0.0050	< 0.0050	<0.0005	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	<0.02
Zinc	**3**		0.075 - 2.4	H	0.03	FW	5	AO	0.0101	0.0078	0.004	0.0069	< 0.0050	<0.002	0.0061	0.0065	< 0.0050	0.0122	0.0127	0.02
Zirconium									< 0.00050	< 0.00050	<0.0001	< 0.00050	< 0.00050	<0.0001	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.002
Cesium									-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum									-	-	-	-	-	-	-	-	-	-	-	-
Rhenium									-	-	-	-	-	-	-	-	-	-	-	-
Rubidium									-	-	-	-	-	-	-	-	-	-	-	-
Tungsten	**0.003**								-		-	-		-	-	-	-	-		-

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.
Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

H = Hardness-dependant; V= Standard is valence dependent. VI refers to chromium [VI] and III refers to chromium [III]
Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied
AO = Aesthetic Objective; OG = Operational Guideline
Site falls under Schedule 2 G2 activity; CSR iron and manganese standards do not

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate.
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient

Table 18
Results of Groundwater Analyses - Dissolved Metals
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	Notes	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Notes	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19-MW16-14	K19-MW16-15	K19-MW16-15	K19-MW17-01S	K19-MW17-01D	K19-MW17-01D	K19-MW17-02	K19-MW17-02	K19-MW17-04	K19-MW17-05	K19-MW17-05	K19-MW17-06	K19-MW17-06	K19-MW17-07	K19-MW17-07	K19-MW17-10
Sample Control Number									3809-01	K19-MW16-15	K19-MW16-15	03844-04	03375-06	3809-02	03375-05	3809-04	03765-02	03375-07	03798-01	06689-06	03815-05	06690-01	03815-02	03765-01
Laboratory Report Number									17N238668	B621590	B648667	17N243343	B709734	17N238668	B709734	17N238668	17N243343	B709734	17N243826	B709775	17N242036	B710365	17N242036	17N243343
Date Sampled									15-Jul-17	17-Mar-16	13-Jun-16	23-Jul-17	5-Feb-17	15-Jul-17	5-Feb-17	15-Jul-17	25-Jul-17	5-Feb-17	27-Jul-17	6-Feb-17	20-Jul-17	7-Feb-17	20-Jul-17	25-Jul-17
QA/QC									N			N		N		N	N		N		N		N	N
APEC									1b			1b	1b	1b	1b	1b		7b, 23a	7b, 23a	7a, 23a	7a, 23a	2b, 20	2b, 20	7b, 23a
Field Parameters																								
Dissolved Oxygen									3.14	4.36	1.08	644	5.33	3.34	2.83	3.67	-	5.01	4.28	0.84	8.39	7.25	6.98	4.01
Conductivity (µS/cm)									1660	826	769	2863	829	1372	798.3	1281	-	3753	3489	1598	1354	1015	42.1	2742
Oxidation Reduction Potential (mV)									-19.4	59.1	74.2	-86.4	-2.2	-19	-31.6	-35.1	-	62.2	19.6	-1.5	-23	27.6	38.4	48.3
pH (pH units)									6.35	6.25	6.08	6.48	6.54	6.35	6.74	6.42	-	6.07	5.75	6.99	6.99	6.75	6.31	5.81
Temperature (°C)									7.1	5.1	6.8	6.8	4.4	9.8	1.5	5.8	-	1.4	7	3.5	5	3.7	9.8	6.9
Physical Tests																								
Hardness (as CaCO3)									409	424	248	504	449	346	381	352	280	1610	1420	515	534	382	357	1330
Salinity			15000							-	9.75		34		47.1			64.7		122		20.4		
Anions and Nutrients																								
Chloride	**250**		1500		120		250	AO	103	-	5.9	-	68	-	76	-	-	**1200**	**1190**	210	-	12	-	**1050**
Dissolved Metals																								
Aluminum	**9.5**				0.5	IG/L	0.1	OG	0.007	0.0801	0.0342	0.013	0.0099	0.004	0.0067	0.003	0.011	0.0361	0.046	<0.03	0.054	0.0054	0.003	0.035
Antimony	**0.006**		0.09		2	FW	0.006		<0.0002	< 0.00050	< 0.00050	0.0004	<0.0005	<0.0002	<0.0005	<0.0002	0.0005	<0.0005	<0.0002	<0.005	<0.0002	<0.0005	<0.0002	<0.0002
Arsenic	**0.01**		0.05		0.005	FW	0.01		0.0005	0.00062	0.00092	**0.012**	0.0002	0.0007	0.00043	0.0009	0.0005	0.0001	0.0004	0.001	0.0004	0.00017	0.0002	0.0004
									0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Barium	**1**		10		2.9	FW	1		**5.2**	0.135	0.0947	0.96	**6.32**	**5.74**	**6.18**	**5.19**	0.0518	**1.18**	0.805	**13**	**12.5**	0.149	0.109	**3.63**
Beryllium	**0.008**		0.0015		0.0053	FW			<0.00001	< 0.00010	< 0.00010	0.00001	<0.0001	<0.00001	<0.0001	0.00005	0.00006	0.00017	0.00012	<0.001	0.00002	<0.0001	0.00005	0.00013
Bismuth									<0.00005	< 0.0010	< 0.0010	<0.00005	<0.001	<0.00005	<0.001	<0.00005	<0.00005	<0.001	<0.00005	<0.01	<0.00005	<0.001	<0.00005	<0.00005
Boron	**5**		12		0.5	IG	5		0.129	0.31	0.31	0.027	0.176	0.119	0.143	0.148	0.253	0.149	0.113	<0.5	0.289	0.337	0.307	0.133
Cadmium	**0.005**		0.0005 - 0.004	H	0.000017	FW	0.005		<0.00001	0.000199	0.00005	<0.00001	0.00007	<0.00001	<0.00001	0.00001	<0.00001	0.00002	<0.00001	*<0.0001*	0.00002	0.000021	0.00003	0.00019
Calcium									108	127	126	120	124	90.6	99.5	93.1	65.5	451	378	133	134	101	95.2	366
Chromium	**0.05VI/6III**	V	0.01VI/0.09III	V	0.0089	FW	0.05[VI]	V	<0.0005	< 0.0010	< 0.0010	0.0007	<0.001	<0.0005	<0.001	<0.0005	<0.0005	<0.001	<0.0005	*<0.01*	<0.0005	<0.001	<0.0005	<0.0005
Cobalt	**0.001**		0.04		1	L			0.00098	**0.00825**	**0.00313**	**0.00114**	**0.00411**	0.00026	**0.00134**	**0.00235**	**0.00318**	**0.00236**	0.00028	*<0.005*	0.00037	**0.00169**	**0.00151**	**0.0102**
Copper	**1.5**		0.02	H	0.2	IG	1	AO	0.0004	0.00029	< 0.00020	0.0004	0.00077	0.0003	<0.0002	0.0002	0.001	<0.0002	<0.0002	0.0034	0.0004	0.00038	0.0004	0.0007
Iron	**6.5**				0.3	FW	0.3	AO	10.7	3.18	6.1	146	1.28	8.66	11	12.3	0.024	44.7	55.2	1.72	1.26	0.969	0.87	16.4
Lead	**0.01**		0.04	H	0.1	L	0.01		<0.00005	< 0.00020	< 0.00020	0.00005	<0.0002	<0.00005	<0.0002	<0.00005	<0.00005	<0.0002	<0.00005	<0.002	0.00015	<0.0002	<0.00005	0.00007
Lithium	**0.008**								**0.0784**	**0.169**	**0.18**	**0.0125**	**0.0855**	**0.0718**	**0.086**	**0.0785**	**0.173**	**0.224**	**0.193**	**0.144**	**0.167**	**0.126**	**0.164**	**0.216**
Magnesium									33.9	25.8	25.3	49.6	33.9	29.1	32.1	29	28.2	117	115	44.5	48.5	31.7	28.9	102
Manganese	**1.5**				0.2	IG	0.05	AO	0.708	1.07	1.16	1.93	0.602	0.28	0.344	0.431	0.576	18.1	17.2	1.6	1.61	1.19	1.18	14.7
Mercury	**0.001**		0.00025		0.000026	FW	0.001		<0.00001	< 0.000010	< 0.000010	0.00004	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Molybdenum	**0.25**		10		0.073	FW			0.00008	< 0.0010	< 0.0010	0.00135	<0.001	0.00017	<0.001	0.0003	0.00317	<0.001	<0.00005	<0.01	0.00013	<0.001	0.00014	0.00116
Nickel	**0.08**		0.25	H	0.2	IG			0.0039	0.0136	0.007	0.0022	0.0071	0.0005	0.0013	0.0006	0.0103	0.0018	0.0004	<0.01	0.0006	0.0019	0.0014	0.0185
Phosphorus									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium									1.87	3.21	2.34	1.59	6.21	1.64	3.1	3.05	4.98	5.45	4.07	4.62	2.82	4.18	2.47	6.76
Selenium	**0.01**		0.02		0.001	FW	0.01		0.0007	0.0003	< 0.00010	0.0023	0.00024	0.0007	<0.0001	0.0006	**0.0116**	<0.0001	<0.0005	<0.001	<0.0005	<0.0001	<0.0005	<0.0005
Silicon									5.54	9.9	10.8	4.44	9.98	5.46	8.23	6.5	5.08	11.5	7.83	6.2	4.49	9.17	6.86	8.1
Silver	**0.02**		0.0005	H	0.0001	FW			<0.00002	< 0.000020	< 0.000020	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	*<0.0002*	<0.00002	<0.00002	<0.00002	<0.00002
Sodium	**200**						200	AO	13.3	24.7	24	23.4	13.4	13	18.5	18.1	17.9	25.5	25.8	48.1	38.2	16.9	15.6	41
Strontium	**2.5**								0.625	0.631	0.585	0.838	0.56	0.498	0.49	0.467	0.686	2.4	2.25	1.33	1.83	0.732	0.96	2.0
Sulphur									5.15	10.1	12.8	10.9	<3	1.17	<3	2.06	33.9	<3	6.03	<30	1.86	8.3	8.63	5.1
Tellurium										-	-		-		-			-		-		-		
Thallium			0.003		0.0008	FW			<0.00001	< 0.000050	< 0.000050	<0.00001	0.000013	<0.00001	<0.00001	<0.00001	0.00002	<0.00001	<0.00001	<0.0001	<0.00001	0.000014	<0.00001	0.00001
Thorium-232										-	-		-		-			-		-		-		
Tin	**2.5**								<0.00005	< 0.0050	< 0.0050	0.00009	<0.005	<0.00005	<0.005	0.00013	0.00045	<0.005	0.00006	<0.05	0.00021	<0.005	0.00028	0.00012
Titanium			1		0.1	FW			0.0027	< 0.0050	< 0.0050	0.0028	<0.005	0.0027	<0.005	0.0028	0.0012	<0.005	0.002	<0.05	0.0033	<0.005	0.0021	0.0019
Uranium	**0.02**		0.085		0.01	IG	0.02		0.00008	0.0011	0.00041	0.00155	0.00217	0.00007	0.00065	0.00111	0.00429	0.00021	0.0001	0.0014	0.00033	0.00214	0.00036	0.00067
Vanadium	**0.02**				0.1	IG/L			<0.0005	< 0.0050	< 0.0050	0.0028	<0.005	<0.0005	<0.005	<0.0005	0.0009	<0.005	<0.0005	*<0.05*	<0.0005	<0.005	<0.0005	<0.0005
Zinc	**3**		0.075 - 2.4	H	0.03	FW	5	AO	0.011	0.0102	0.0079	0.002	0.0094	0.004	0.0095	0.003	0.003	0.0104	<0.002	*<0.05*	0.012	<0.005	0.006	0.024
Zirconium									<0.0001	< 0.00050	< 0.00050	0.0025	<0.0005	<0.0001	<0.0005	0.0001	0.0001	<0.0005	<0.0001	<0.005	0.0002	<0.0005	<0.0001	<0.0001
Cesium									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rhenium									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rubidium									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten	**0.003**								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.
Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.
B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)
Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.
H = Hardness-dependant; V= Standard is valence dependent. VI refers to chromium [VI] and III refers to chromium [III]
Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied
AO = Aesthetic Objective; OG = Operational Guideline
Site falls under Schedule 2 G2 activity; CSR iron and manganese standards do not
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate.
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 18
Results of Groundwater Analyses - Dissolved Metals
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	Notes	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Notes	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19-MW17-11	K19-MW17-11	K19-MW17-12	K19-MW17-12	K19-MW17-13	K19-MW17-13	K19-MW17-13	K19-MW17-17	K19-MW17-18	K19-MW17-19	K19-MW17-20	K19-MW17-21	K19-MW17-21	K19-MW17-22
Sample Control Number									06706-02	03830-01	06690-08	03815-01	06690-04	06690-05	03830-04	03797-02	03797-03	03765-03	03765-06	03765-04	03765-05	03762-04
Laboratory Report Number									B710365	17N240971	B710365	17N242036	B710365	B710365	17N240971	17N243826	17N243826	17N243343	17N243343	17N243343	17N243343	17N244304
Date Sampled									8-Feb-17	16-Jul-17	9-Feb-17	20-Jul-17	8-Feb-17	8-Feb-17	16-Jul-17	26-Jul-17	26-Jul-17	25-Jul-17	25-Jul-17	25-Jul-17	25-Jul-17	28-Jul-17
QA/QC										N		N	FDA	FD	N	N	N	N	N	N	FD	N
APEC									5, 24	5, 24	19	19	22	22	22	26	24	27	6	21	21	25
Field Parameters																						
Dissolved Oxygen									-	8.17	2.29	3.46	2.11	2.11	5.91	6.45	7.26	3.64	2.97	0.65	0.65	4.59
Conductivity (µS/cm)									-	404.5	1644	769	762.8	762.8	507.1	516.2	443.6	566.1	446.3	367.6	367.6	520.1
Oxidation Reduction Potential (mV)									-	-19.8	3.8	13.3	6	6	-14.9	14.6	3.4	4.5	35.9	-15.5	-15.5	-36.5
pH (pH units)									-	6.8	7.43	6.85	7.1	7.1	6.79	7.35	6.73	6.98	6.58	7.08	7.08	7.35
Temperature (°C)									-	4.5	2.4	12.3	3.9	3.9	5.7	8.1	8.1	9.6	7.7	8.8	8.8	8.7
Physical Tests																						
Hardness (as CaCO3)									206	192	353	330	209	210	217	277	230	284	263	176	175	242
Salinity			15000						1.14		2.84		28.3	28.8								
Anions and Nutrients																						
Chloride	**250**		1500		120		250	AO	0.69	-	1.7	-	27	25	-	0.89	0.47	46.7	<5	1.98	1.95	13.7
Dissolved Metals																						
Aluminum	**9.5**				0.5	IG/L	0.1	OG	0.0033	0.003	0.0061	<0.002	<0.003	<0.003	<0.002	<0.002	<0.002	<0.002	0.004	<0.002	<0.002	0.005
Antimony	**0.006**		0.09		2	FW	0.006		<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	0.0018	<0.0002	0.0003	<0.0002	<0.0002	<0.0002	<0.0002
Arsenic	**0.01**		0.05		0.005	FW	0.01		0.00027	0.0002	0.00014	0.0004	0.00011	0.00012	0.0002	0.0011	0.0002	0.0002	0.0001	0.0002	0.0002	0.0001
									0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barium	**1**		10		2.9	FW	1		0.231	0.137	0.037	0.0285	0.211	0.214	0.22	**3.1**	0.187	0.129	0.0925	0.141	0.135	0.0925
Beryllium	**0.008**		0.0015		0.0053	FW			<0.0001	0.00002	<0.0001	<0.00001	<0.0001	<0.0001	0.00001	<0.00001	0.00004	<0.00001	0.00002	<0.00001	<0.00001	0.00001
Bismuth									<0.001	<0.00005	<0.001	<0.00005	<0.001	<0.001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Boron	**5**		12		0.5	IG	5		0.126	0.108	0.699	0.722	0.266	0.249	0.253	0.208	0.116	0.095	0.095	0.273	0.243	0.258
Cadmium	**0.005**		0.0005 - 0.004	H	0.000017	FW	0.005		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00001	0.00001	<0.00001	0.00006	<0.00001	<0.00001	<0.00001
Calcium									55.4	51.2	64.5	61.2	52.1	52.8	54.2	73.6	61.7	76.4	69.4	38.6	38.6	57.5
Chromium	**0.05VI/6III**	V	0.01VI/0.09III	V	0.0089	FW	0.05[VI]	V	<0.001	<0.0005	<0.001	<0.0005	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	**0.001**		0.04		1	L			**0.00106**	<0.00005	<0.0005	0.00021	<0.0005	<0.0005	0.00029	**0.00198**	0.00075	0.00079	0.00031	0.00024	0.00024	0.00026
Copper	**1.5**		0.02	H	0.2	IG	1	AO	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	0.0003	0.0012	0.0002	0.0004	<0.0002	<0.0002	<0.0002
Iron	**6.5**				0.3	FW	0.3	AO	0.932	2.24	0.0945	0.114	0.926	0.856	0.848	0.01	0.772	0.735	<0.01	0.707	0.709	0.745
Lead	**0.01**		0.04	H	0.1	L	0.01		0.0002	<0.00005	<0.0002	<0.00005	<0.0002	<0.0002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Lithium	**0.008**								**0.0745**	**0.0748**	**0.267**	**0.311**	**0.131**	**0.111**	**0.132**	**0.115**	**0.0709**	**0.0581**	**0.0641**	**0.112**	**0.117**	**0.109**
Magnesium									16.4	15.6	46.5	43	19.2	19	19.8	22.6	18.5	22.6	21.9	19.3	19.1	24
Manganese	**1.5**				0.2	IG	0.05	AO	0.356	0.296	0.15	0.172	0.746	0.766	0.799	0.354	0.689	0.157	0.042	0.606	0.606	0.782
Mercury	**0.001**		0.00025		0.000026	FW	0.001		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Molybdenum	**0.25**		10		0.073	FW			<0.001	0.00024	<0.001	0.00037	<0.001	<0.001	<0.00005	0.00829	0.00264	0.00068	0.00007	0.00023	0.00019	0.00029
Nickel	**0.08**		0.25	H	0.2	IG			0.0039	<0.0002	<0.001	0.0004	<0.001	<0.001	<0.0002	0.0055	0.001	0.003	0.0033	0.0004	0.0004	0.0004
Phosphorus									-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium									2.13	1.41	2.84	2.35	2.26	2.2	1.98	5	2.01	2.59	1.61	2.35	2.32	2.22
Selenium	**0.01**		0.02		0.001	FW	0.01		<0.0001	<0.0005	<0.0001	<0.0005	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Silicon									7.04	5.1	4.18	3.26	7.68	8.05	5.83	4.08	5.43	5	5.63	5.63	5.61	5.89
Silver	**0.02**		0.0005	H	0.0001	FW			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Sodium	**200**						200	AO	9.55	9.68	105	113	11.1	11.3	11.7	15	22	17.3	9.39	10.6	10.4	12.3
Strontium	**2.5**								0.195	0.22	1.32	1.71	0.543	0.527	0.691	0.588	0.349	0.37	0.288	0.756	0.748	0.741
Sulphur									5.6	4.97	26	27.7	<3	<3	2.31	1.66	3.44	10.1	8.11	3.92	3.92	8.15
Tellurium									-		-		-	-								
Thallium			0.003		0.0008	FW			<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00001	<0.00001	<0.00001	<0.00001
Thorium-232									-		-		-	-								
Tin	**2.5**								<0.005	0.00006	<0.005	0.00018	<0.005	<0.005	0.0001	0.00015	0.00005	0.00011	<0.00005	0.00015	0.00014	0.00009
Titanium			1		0.1	FW			<0.005	0.0013	<0.005	0.0014	<0.005	<0.005	0.0013	0.001	0.0011	0.0011	0.0018	0.0011	0.0012	0.0015
Uranium	**0.02**		0.085		0.01	IG	0.02		0.00041	0.00002	0.00054	0.00011	0.0003	0.00031	0.00016	0.00285	0.00117	0.00117	0.00049	0.00043	0.00039	0.00024
Vanadium	**0.02**				0.1	IG/L			<0.005	<0.0005	<0.005	<0.0005	<0.005	<0.005	<0.0005	0.0008	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	**3**		0.075 - 2.4	H	0.03	FW	5	AO	<0.005	<0.002	<0.005	<0.002	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003
Zirconium									<0.0005	<0.0001	<0.0005	0.0002	<0.0005	<0.0005	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cesium									-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum									-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rhenium									-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rubidium									-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten	**0.003**								-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.
Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.
B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)
Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.
H = Hardness-dependant; V= Standard is valence dependent. VI refers to chromium [VI] and III refers to chromium [III]
Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied
AO = Aesthetic Objective; OG = Operational Guideline
Site falls under Schedule 2 G2 activity; CSR iron and manganese standards do not

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate.
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient

Table 18
Results of Groundwater Analyses - Dissolved Metals
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	Notes	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Notes	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19-MW17-23	K19-MW17-24	K19-MW17-24	K19-MW17-25	K19-MW17-26	K19-MW17-27	K19-MW17-28	K19-MW17-29D	K19-MW17-29S	K19-MW17-30	K19-MW17-31	K19-MW17-32	K19-MW17-33	K19-MW17-34	K19-MW17-35D	K19-MW17-35D	K19-MW17-35S
Sample Control Number									03762-03	03797-04	03797-05	03797-06	03763-04	03798-02	03798-03	03762-07	03763-05	03762-01	03762-02	03798-04	03762-05	03762-06	03763-01	03763-02	03763-06
Laboratory Report Number									17N244304	17N243826	17N243826	17N243826	17N244304	17N243826	17N243826	17N244304	17N244304	17N244304	17N244304	17N243826	17N244304	17N244304	17N244304	17N244304	17N244304
Date Sampled									28-Jul-17	26-Jul-17	26-Jul-17	26-Jul-17	30-Jul-17	27-Jul-17	27-Jul-17	28-Jul-17	30-Jul-17	28-Jul-17	29-Jul-17	27-Jul-17	28-Jul-17	28-Jul-17	29-Jul-17	29-Jul-17	30-Jul-17
QA/QC									N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	FD	N
APEC									18	17	17	16	19	20	4	1b	1b	12	11	1d	14	15	1b	1b	1b
Field Parameters																									
Dissolved Oxygen									3.33	2.17	2.17	5.29	-	1.71	1.55	1.3	-	2.95	3.63	6.12	3.16	2.32	0.59	0.59	-
Conductivity (µS/cm)									863	437	437	373.2	-	516.1	458.6	857	-	414.6	473.5	693.4	334.8	374.8	490.9	490.9	-
Oxidation Reduction Potential (mV)									-7.2	-33.2	-33.2	-4.3	-	-0.7	-14.6	-36.3	-	-23.4	-22.5	-8.8	-2.5	-12.4	-98.4	-98.4	-
pH (pH units)									7.78	6.96	6.96	6.77	-	6.56	6.17	6.51	-	6.91	7.19	7.11	6.4	6.56	6.58	6.58	-
Temperature (°C)									8.4	6.5	6.5	7.3	-	6.6	6.3	7.4	-	6.1	7.6	7.7	6.6	7.7	6.5	6.5	-
Physical Tests																									
Hardness (as CaCO3)									60.1	140	138	145	344	244	179	378	521	155	201	358	138	160	230	232	51.9
Salinity			15000																						
Anions and Nutrients																									
Chloride	**250**		1500		120		250	AO	0.61	0.45	0.47	0.48	12.3	18	43.8	84.9	122	8.82	0.25	1.35	0.33	0.66	1.84	1.83	3.16
Dissolved Metals																									
Aluminum	**9.5**				0.5	IG/L	0.1	OG	0.007	<0.002	<0.002	0.004	0.006	<0.002	0.004	0.008	0.028	0.004	0.005	<0.002	0.01	0.012	0.006	0.007	0.079
Antimony	**0.006**		0.09		2	FW	0.006		0.0003	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	0.0006	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Arsenic	**0.01**		0.05		0.005	FW	0.01		0.0003	0.0004	0.0004	0.002	0.0002	0.0002	0.0004	0.0003	0.0009	0.0002	0.0003	0.0002	0.0024	0.0046	0.0004	0.0006	0.0005
									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barium	**1**		10		2.9	FW	1		**1.22**	**2.04**	**1.93**	0.218	0.0859	0.0612	0.517	**8.02**	0.521	0.721	0.53	0.0989	0.115	0.115	0.998	0.994	0.0893
Beryllium	**0.008**		0.0015		0.0053	FW			<0.00001	0.00001	0.00001	0.00004	<0.00001	0.00002	0.00003	0.00002	0.00016	0.00001	0.00001	0.00001	0.00005	0.00002	0.00001	0.00002	0.00015
Bismuth									<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Boron	**5**		12		0.5	IG	5		0.904	0.128	0.121	0.165	0.246	0.126	0.071	0.197	0.108	0.187	0.132	0.105	0.11	0.161	0.055	0.058	0.028
Cadmium	**0.005**		0.0005 - 0.004	H	0.000017	FW	0.005		0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00008	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00003
Calcium									14.5	34.4	33.5	38.1	91.9	67.4	43.5	93	121	33.4	51.2	91.1	34.5	43	61.1	61.9	14.3
Chromium	**0.05VI/6III**	V	0.01VI/0.09III	V	0.0089	FW	0.05[VI]	V	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0059	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	**0.001**		0.04		1	L			0.00026	0.00041	0.00035	0.00081	**0.00108**	0.00035	0.00098	0.00046	**0.0173**	0.00021	0.00045	0.00059	**0.00172**	0.00025	0.00045	0.00046	**0.00312**
Copper	**1.5**		0.02	H	0.2	IG	1	AO	0.0002	<0.0002	<0.0002	<0.0002	0.0015	<0.0002	<0.0002	<0.0002	0.0045	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	0.0021
Iron	**6.5**				0.3	FW	0.3	AO	<0.01	0.72	0.738	1.87	0.383	1.86	18.6	9.59	1.61	1.32	0.225	1.28	1.93	4.01	24.1	24.4	0.128
Lead	**0.01**		0.04	H	0.1	L	0.01		0.0002	<0.00005	<0.00005	<0.00005	0.00011	<0.00005	<0.00005	<0.00005	0.00006	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00006
Lithium	**0.008**								**0.428**	**0.0847**	**0.0813**	**0.0944**	**0.118**	**0.0737**	**0.0628**	**0.0936**	**0.0522**	**0.083**	**0.0992**	**0.0633**	**0.075**	**0.096**	**0.042**	**0.0437**	0.0069
Magnesium									5.79	13.1	13.1	12.1	27.8	18.3	17	35.4	53.2	17.5	17.7	31.7	12.7	12.9	18.9	18.9	3.93
Manganese	**1.5**				0.2	IG	0.05	AO	0.048	0.301	0.296	0.456	0.673	0.792	0.658	0.643	1.75	0.268	0.364	0.151	0.262	0.768	0.233	0.233	0.32
Mercury	**0.001**		0.00025		0.000026	FW	0.001		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Molybdenum	**0.25**		10		0.073	FW			0.00208	0.00064	0.0005	0.00067	0.00078	0.00022	0.00029	0.00016	0.00433	0.00023	0.00352	0.00509	0.00036	0.00052	0.00043	0.0004	0.00049
Nickel	**0.08**		0.25	H	0.2	IG			0.001	0.0017	0.0014	0.0007	0.0022	<0.0002	0.0003	0.0013	0.019	0.0003	0.0012	0.0006	0.0025	0.0005	0.0007	0.0007	0.0114
Phosphorus									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium									2.23	2.32	2.38	1.78	6	2.1	1.52	2.22	13.5	2.38	3.09	3.29	1.58	1.24	1.48	1.46	2.1
Selenium	**0.01**		0.02		0.001	FW	0.01		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0008	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Silicon									2.98	3.69	3.53	3.89	6.11	5.26	5.86	5.77	6.06	5.01	3.72	4.47	5.43	4.23	4.37	4.4	4.3
Silver	**0.02**		0.0005	H	0.0001	FW			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Sodium	**200**						200	AO	178	62	64.1	37.5	21	20.1	8.97	25.5	77.5	28.3	26.2	13.9	14.9	18.9	9.3	9.18	8.99
Strontium	**2.5**								0.545	0.55	0.492	0.391	0.745	0.602	0.214	1.05	0.92	0.954	0.689	0.44	0.228	0.262	0.288	0.289	0.0502
Sulphur									1.86	0.612	0.566	1.96	16.5	12.2	1.37	1.88	11	0.838	1.36	12.3	4.33	4.3	6.01	6.2	5.95
Tellurium																									
Thallium			0.003		0.0008	FW			<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00003	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Thorium-232																									
Tin	**2.5**								0.00031	0.00013	0.00012	0.00008	0.00017	0.00016	0.00009	<0.00005	0.00073	0.0001	0.00016	0.00015	0.00012	0.00012	0.00008	0.00008	0.00046
Titanium			1		0.1	FW			0.0011	0.0008	0.0008	0.0011	0.0014	0.001	0.0019	0.0021	0.0019	0.0012	0.0009	0.0011	0.0016	0.0013	0.0028	0.0029	0.0018
Uranium	**0.02**		0.085		0.01	IG	0.02		0.00051	0.0004	0.00038	0.00044	0.00018	0.00037	0.00015	0.00036	0.00975	0.00025	0.00181	0.00357	0.00048	0.00045	0.00023	0.00022	0.00016
Vanadium	**0.02**				0.1	IG/L			0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0011	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0009
Zinc	**3**		0.075 - 2.4	H	0.03	FW	5	AO	0.003	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	0.004	0.014	<0.002	<0.002	<0.002	0.005	0.002	<0.002	<0.002	0.008
Zirconium									0.0003	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	0.0021	<0.0001	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0005
Cesium									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rhenium									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rubidium									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten	**0.003**								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.
Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

H = Hardness-dependant; V= Standard is valence dependent. VI refers to chromium [VI] and III refers to chromium [III]
Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied
AO = Aesthetic Objective; OG = Operational Guideline
Site falls under Schedule 2 G2 activity; CSR iron and manganese standards do not

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate.
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient

Table 18
Results of Groundwater Analyses - Dissolved Metals
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	Notes	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Notes	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19 DW WELL	K19 DW WELL	<19-Onsite Water Sr	Pink MTN Sa1	DRILL WATER
Sample Control Number									DUP-DW-K19	K19 DW WELL	<19-Onsite Water Sr	DRILL WATER/ PINKMTN/SA1	03605-01
Laboratory Report Number									B648667	B648667	B619935	B618204	17N244304
Date Sampled									15-Jun-16	15-Jun-16	11-Mar-16	8-Mar-16	27-Jul-17
QA/QC									FD	FDA			N
APEC													
Field Parameters													
Dissolved Oxygen									4.37	4.37	-	-	5.2
Conductivity (µS/cm)									36.9	36.9	-	-	601
Oxidation Reduction Potential (mV)									53.4	53.4	-	-	-3.7
pH (pH units)									6.39	6.39	-	-	7.87
Temperature (°C)									6.3	6.3	-	-	22.1
Physical Tests													
Hardness (as CaCO3)									14.8	14.2	82.3	333	278
Salinity			15000						1.43	1.43	-	-	
Anions and Nutrients													
Chloride	**250**		1500		120		250	AO	2.2	2.2	-	-	6.05
Dissolved Metals													
Aluminum	**9.5**				0.5	IG/L	0.1	OG	1.03	0.901	0.298	0.0417	0.01
Antimony	**0.006**		0.09		2	FW	0.006		< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0002
Arsenic	**0.01**		0.05		0.005	FW	0.01		0.00054	0.00052	0.00365	0.00097	0.0001
									0	0	0	0	0
Barium	**1**		10		2.9	FW	1		0.128	0.126	0.129	0.112	0.0977
Beryllium	**0.008**		0.0015		0.0053	FW			< 0.00010	< 0.00010	< 0.00010	< 0.00010	<0.00001
Bismuth									< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.00005
Boron	**5**		12		0.5	IG	5		< 0.05	< 0.05	< 0.05	0.063	0.025
Cadmium	**0.005**		0.0005 - 0.004	H	0.000017	FW	0.005		0.000067	0.000069	0.000023	0.000013	<0.00001
Calcium									4.08	3.91	22.2	103	79
Chromium	**0.05VI/6III**	V	0.01VI/0.09III	V	0.0089	FW	0.05[VI]	V	0.0014	0.0014	< 0.0010	< 0.0010	0.001
Cobalt	**0.001**		0.04		1	L			0.00073	0.00075	**0.00455**	< 0.00050	0.00007
Copper	**1.5**		0.02	H	0.2	IG	1	AO	0.0042	0.00408	0.00128	0.00144	<0.0002
Iron	**6.5**				0.3	FW	0.3	AO	1.6	1.57	8.79	0.0156	0.031
Lead	**0.01**		0.04	H	0.1	L	0.01		0.00057	0.00058	< 0.00020	0.00027	<0.00005
Lithium	**0.008**								< 0.0050	< 0.0050	< 0.0050	**0.0189**	**0.019**
Magnesium									1.12	1.08	6.54	18.8	19.6
Manganese	**1.5**				0.2	IG	0.05	AO	0.0533	0.0533	0.604	0.004	0.028
Mercury	**0.001**		0.00025		0.000026	FW	0.001		< 0.000010	< 0.000010	< 0.000010	< 0.000010	<0.00001
Molybdenum	**0.25**		10		0.073	FW			< 0.0010	< 0.0010	< 0.0010	< 0.0010	0.00098
Nickel	**0.08**		0.25	H	0.2	IG			0.006	0.006	0.0048	< 0.0010	0.0015
Phosphorus									-	-	-	-	-
Potassium									1.64	1.62	1.33	1.09	0.788
Selenium	**0.01**		0.02		0.001	FW	0.01		< 0.00010	< 0.00010	0.00018	0.00047	0.0009
Silicon									4	4.23	3.4	2.24	1.66
Silver	**0.02**		0.0005	H	0.0001	FW			< 0.000020	< 0.000020	< 0.000020	< 0.000020	<0.00002
Sodium	**200**						200	AO	0.564	0.562	5.71	13	17.6
Strontium	**2.5**								0.0164	0.016	0.0751	0.321	0.457
Sulphur									< 3.0	< 3.0	4.2	23.6	19.1
Tellurium									-	-	-	-	
Thallium			0.003		0.0008	FW			< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00001
Thorium-232									-	-	-	-	
Tin	**2.5**								< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.00005
Titanium			1		0.1	FW			0.0368	0.033	< 0.0050	< 0.0050	0.0005
Uranium	**0.02**		0.085		0.01	IG	0.02		0.00014	0.00013	0.00031	0.00066	0.00075
Vanadium	**0.02**				0.1	IG/L			< 0.0050	< 0.0050	< 0.0050	< 0.0050	<0.0005
Zinc	**3**		0.075 - 2.4	H	0.03	FW	5	AO	0.109	0.109	0.0062	< 0.0050	0.006
Zirconium									0.00232	0.00185	0.00116	< 0.00050	<0.0001
Cesium									-	-	-	-	-
Lanthanum									-	-	-	-	-
Rhenium									-	-	-	-	-
Rubidium									-	-	-	-	-
Tungsten	**0.003**								-	-	-	-	-

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.

Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

H = Hardness-dependant; V= Standard is valence dependent. VI refers to chromium [VI] and III refers to chromium [III]

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied

AO = Aesthetic Objective; OG = Operational Guideline

Site falls under Schedule 2 G2 activity; CSR iron and manganese standards do not

QA/QC = Quality Assurance/Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Italics - indicates that the detection limit exceeds one or more criteria.

APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 19
Results of Groundwater Analyses - Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19A-09MW-01	K19-09MW-01	K19A-09MW-01	K19A-09MW-01	K19A-09MW-02	K19A-09MW-02	K19A-09MW-02	K19A-09MW-02	K19A-09MW-02	K19A-09MW-03	K19A-09MW-03	K19A-09MW-03	K19-09MW-03	K19A-10MW-03
Sample Control Number							-	K19A-09MW-01	03375-01	03375-02	-	K19A-09MW-02	-	06706-05	03830-05	-	K19A-09MW-03	06706-04	03816-03	3808-06
Laboratory ID							101110157	B648291	B709734	B709734	101110157	B646703	101110157	B710365	17N240971	101110157	B646703	B710365	17N242036	17N238668
Date Sampled							7-Nov-09	10-Jun-16	4-Feb-17	4-Feb-17	7-Nov-09	8-Jun-16	7-Nov-09	9-Feb-17	16-Jul-17	7-Nov-09	9-Jun-16	9-Feb-17	21-Jul-17	14-Jul-17
QA/QC									FDA	FD	FD		FDA							
APEC/ AEC							1a	1a	1a	1a	1a	1a	1a	1a	1a	1a	1a	1a	1a	1b
Non-Halogenated Volatiles																				
Benzene	**0.005**	0.4	0.088	L	0.005		-	< 0.00040	<0.0004	<0.0004	-	< 0.00040	-	<0.0004	<0.0005	<0.0001	< 0.00040	<0.0004	<0.0005	<0.0005
Ethylbenzene	**0.14**	2	3.2	L	0.0016	AO	-	< 0.00040	<0.0004	<0.0004	-	< 0.00040	-	<0.0004	<0.0005	<0.0001	< 0.00040	<0.0004	<0.0005	<0.0005
Toluene	**0.06**	0.005	4.9	L	0.024	AO	-	< 0.00040	<0.0004	<0.0004	-	< 0.00040	-	<0.0004	<0.0005	<0.0001	< 0.00040	<0.0004	<0.0005	<0.0005
Xylenes	**0.09**	0.3	13	L	0.02	AO	-	< 0.00040	<0.0004	<0.0004	-	< 0.00040	-	<0.0004	<0.001	<0.0001	< 0.00040	<0.0004	<0.001	<0.001
ortho-Xylene							-	< 0.00040	<0.0004	<0.0004	-	< 0.00040	-	<0.0004	<0.0005	-	< 0.00040	<0.0004	<0.0005	<0.0005
meta- & para-Xylene							-	< 0.00040	<0.0004	<0.0004	-	< 0.00040	-	<0.0004	<0.0005	-	< 0.00040	<0.0004	<0.0005	<0.0005
Methyl t-butyl ether (MTBE)	**0.095**	34	6.1	I	0.015	AO	-	< 0.0040	<0.004	<0.004	-	< 0.0040	-	<0.004	<0.001	-	< 0.0040	<0.004	<0.001	<0.001
Styrene	**0.8**	0.72	0.072	FW			-	< 0.00050	<0.0005	<0.0005	-	< 0.00040	-	<0.0005	<0.0005	<0.0001	< 0.00050	<0.0005	<0.0005	<0.0005
Hydrocarbons																				
EPH (C10-C19)	**5**	5					0.31	< 0.20	<0.2	<0.2	<0.25	< 0.20	<0.25	<0.2	<0.1	<0.25	< 0.20	<0.2	-	<0.1
LEPH		0.5					0.31	< 0.20	<0.2	<0.2	<0.25	< 0.20	<0.25	<0.2	<0.1	-	< 0.20	<0.2	-	<0.1
EPH (C19-C32)							<0.25	< 0.20	<0.2	<0.2	<0.25	< 0.20	<0.25	<0.2	<0.1	<0.25	< 0.20	<0.2	-	<0.1
HEPH							<0.25	< 0.20	<0.2	<0.2	<0.25	< 0.20	<0.25	<0.2	<0.1	-	< 0.20	<0.2	-	<0.1
Volatile Hydrocarbons (VH6-10)	**15**	15					-	< 0.3	<0.3	<0.3	-	< 0.3	-	<0.3	<0.1	-	< 0.3	<0.3	<0.1	<0.1
VPH (C6-C10)		1.5					-	< 0.3	<0.3	<0.3	-	< 0.3	-	<0.3	<0.1	-	< 0.3	<0.3	<0.1	<0.1
F2			1.3												-				-	-
F3															-				-	-
F4															-				-	-
Polycyclic Aromatic Hydrocarbons																				
Acenaphthene	**0.25**	0.06	0.0058	FW			<0.0001	< 0.000050	<0.00005	<0.00005	<0.0001	< 0.000050	<0.0001	<0.00005	<0.00002	-	< 0.000050	<0.00005	0.00003	<0.00002
Acenaphthylene			0.046	FW			<0.0001	< 0.000050	<0.00005	<0.00005	<0.0001	< 0.000050	<0.0001	<0.00005	<0.00002	-	< 0.000050	<0.00005	<0.00002	<0.00002
Acridine		0.0005	0.00005	FW			<0.000005	< 0.000050	<0.00005	<0.00005	<0.000005	< 0.000050	<0.000005	<0.00005	<0.00005	-	< 0.000050	<0.00005	<0.00005	<0.00005
Anthracene	**1**	0.001	0.000012	FW			<0.000001	< 0.000010	<0.00001	<0.00001	<0.000001	< 0.000010	<0.000001	<0.00001	<0.00001	-	< 0.000010	<0.00001	<0.00001	<0.00001
Benz(a)anthracene	**0.00007**	0.001	0.000018	FW			<0.00001	< 0.000010	<0.00001	<0.00001	<0.00001	< 0.000010	<0.00001	<0.00001	<0.00001	-	< 0.000010	<0.00001	<0.00001	<0.00001
Benzo(a)pyrene	**0.00001**	0.0001	0.000017	FW	0.00001		<0.00001	< 0.0000090	<0.000009	<0.000009	<0.00001	< 0.0000090	<0.00001	<0.000005	<0.00001	-	< 0.0000090	<0.000005	<0.00001	<0.00001
Benzo(b)fluoranthene							<0.00001	-	-	-	<0.00001	-	<0.00001	-	<0.00001	-	-	-	<0.00001	<0.00001
Benzo(g,h,i)perylene			0.00021	FW			<0.00001	< 0.000050	<0.00005	<0.00005	<0.00001	< 0.000050	<0.00001	<0.00005	<0.00001	-	< 0.000050	<0.00005	<0.00001	<0.00001
Benzo(j)fluoranthene															<0.00001				<0.00001	<0.00001
Benzo(k)fluoranthene			0.00048	FW			<0.00001	< 0.000050	<0.00005	<0.00005	<0.00001	< 0.000050	<0.00001	<0.00005	<0.00001	-	< 0.000050	<0.00005	<0.00001	<0.00001
Chrysene	**0.007**	0.001	0.0014	FW			<0.00001	< 0.000050	<0.00005	<0.00005	<0.00001	< 0.000050	<0.00001	<0.00005	<0.00001	-	< 0.000050	<0.00005	<0.00001	<0.00001
Dibenz(a,h)anthracene	**0.00001**		0.00028	FW			*<0.00001*	*< 0.000050*	<0.000006	<0.000006	*<0.00001*	*< 0.000050*	*<0.00001*	<0.000003	<0.00001	-	*< 0.000050*	<0.000003	<0.00001	<0.00001
Fluoranthene	**0.15**	0.002	0.00048	FW			<0.00004	< 0.000020	<0.00002	<0.00002	<0.00004	< 0.000020	<0.00004	<0.00002	<0.00002	-	< 0.000020	<0.00002	<0.00002	<0.00002
Benzo(b,j) fluoranthene	**0.00007**		0.00004	FW			-	*< 0.000050*	*<0.00005*	*<0.00005*	-	*< 0.000050*	-	<0.00003	<0.00001	-	*< 0.000050*	<0.00003	<0.00001	<0.00001
Fluorene	**0.15**	0.12	0.003	FW			0.00012	< 0.000050	<0.00005	<0.00005	<0.000005	< 0.000050	<0.000005	<0.00005	<0.00002	-	< 0.000050	<0.00005	0.00003	<0.00002
Indeno(1,2,3-c,d)pyrene			0.00023	FW			<0.00001	< 0.000050	<0.00005	<0.00005	<0.00001	< 0.000050	<0.00001	<0.00005	<0.00001	-	< 0.000050	<0.00005	<0.00001	<0.00001
Naphthalene	**0.08**	0.01	0.0011	FW			<0.0003	< 0.00010	<0.0001	<0.0001	<0.0003	< 0.00010	<0.0003	<0.0001	<0.00005	-	< 0.00010	<0.0001	<0.00005	<0.00005
Phenanthrene		0.003	0.0004	FW			0.00007	< 0.000050	<0.00005	<0.00005	<0.000005	< 0.000050	<0.000005	<0.00005	<0.00004	-	< 0.000050	<0.00005	0.00012	<0.00004
Pyrene	**0.1**	0.0002	0.000025	FW			<0.00002	< 0.000020	<0.00002	<0.00002	<0.00002	< 0.000020	<0.00002	<0.00002	<0.00002	-	< 0.000020	<0.00002	<0.00002	<0.00002
Quinoline	**0.00005**	0.034	0.0034	FW			*<0.0005*	*< 0.00024*	<0.00004	<0.00004	*<0.0005*	*< 0.00024*	*<0.0005*	<0.00002	*<0.0001*	-	*< 0.00024*	<0.00002	*<0.0001*	*<0.0001*
2-methylnaphthalene	**0.015**		0.18				-	< 0.00010	<0.0001	<0.0001	-	< 0.00010	-	<0.0001	<0.00005	-	< 0.00010	<0.0001	<0.00005	<0.00005
1-Methylnaphthalene	**0.0055**		0.18				-	-	-	-	-	-	-	-	<0.00005	-	-	-	<0.00005	<0.00005
PAH, Low Molecular Weight							0.00019	< 0.00024	<0.0001	<0.0001	-	< 0.00024	-	<0.0001	-	-	< 0.00024	<0.0001	-	-
PAH, High Molecular Weight							-	< 0.000050	<0.00005	<0.00005	-	< 0.000050	-	<0.00005	-	-	< 0.000050	<0.00005	-	-
Total PAH							0.00019	< 0.00024	<0.0001	<0.0001	-	< 0.00024	-	<0.0001	-	-	< 0.00024	<0.0001	-	-

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.

Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied

AO = Aesthetic Objective; OG = Operational Guideline
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
PAHs = polycyclic aromatic hydrocarbons
EPH (C10-C19) = extractable petroleum hydrocarbons, carbon range 10-19; LEPH = light extractable petroleum hydrocarbons
EPH (C19-C32) = extractable petroleum hydrocarbons, carbon range 19-32; HEPH = heavy extractable petroleum hydrocarbons
VH (C6-C10) = volatile hydrocarbons, carbon range 6-10; VPH = volatile petroleum hydrocarbons

Table 19
Results of Groundwater Analyses - Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19A-09MW-04	K19A-09MW-04	K19A-09MW-05	K19A-09MW-05	K19A-09MW-05	K19A-09MW-06	K19A-09MW-06	K19A-09MW-06	K19A-09MW-06	K19A-09MW-06	K19A-09MW-07	K19A-09MW-07	K19A-09MW-08	K19A-09MW-09
Sample Control Number							-	K19A-09MW-04	-	K19A-09MW-05	MWA	-	K19A-09MW-06	06706-01	03830-02	03830-03	-	K19A-09MW-07	K19A-09MW-08	-
Laboratory ID							101110157	B646703	101110157	B646703	B646703	101110157	B646703	B710365	17N240971	17N240971	101110157	B648667	B648667	101110157
Date Sampled							5-Nov-09	7-Jun-16	5-Nov-09	7-Jun-16 FDA	7-Jun-16 FD	5-Nov-09	7-Jun-16	8-Feb-17	16-Jul-17 FDA	16-Jul-17 FD	5-Nov-09	13-Jun-16	13-Jun-16	5-Nov-09
QA/QC												1a	1a	1a	1a	1a				7b, 23a
APEC/ AEC																				
Non-Halogenated Volatiles																				
Benzene	**0.005**	0.4	0.088	L	0.005		-	< 0.00040	-	< 0.00040	< 0.00040	<0.0001	< 0.00040	<0.0004	<0.0005	<0.0005	-	< 0.00040	< 0.00040	-
Ethylbenzene	**0.14**	2	3.2	L	0.0016	AO	-	< 0.00040	-	< 0.00040	< 0.00040	<0.0001	< 0.00040	<0.0004	<0.0005	<0.0005	-	< 0.00040	< 0.00040	-
Toluene	**0.06**	0.005	4.9	L	0.024	AO	-	< 0.00040	-	< 0.00040	< 0.00040	<0.0001	< 0.00040	<0.0004	<0.0005	<0.0005	-	< 0.00040	< 0.00040	-
Xylenes	**0.09**	0.3	13	L	0.02	AO	-	< 0.00040	-	< 0.00040	< 0.00040	<0.0001	< 0.00040	<0.0004	<0.001	<0.001	-	< 0.00040	< 0.00040	-
ortho-Xylene							-	< 0.00040	-	< 0.00040	< 0.00040	-	< 0.00040	<0.0004	<0.0005	<0.0005	-	< 0.00040	< 0.00040	-
meta- & para-Xylene							-	< 0.00040	-	< 0.00040	< 0.00040	-	< 0.00040	<0.0004	<0.0005	<0.0005	-	< 0.00040	< 0.00040	-
Methyl t-butyl ether (MTBE)	**0.095**	34	6.1	I	0.015	AO	-	< 0.0040	-	< 0.0040	< 0.0040	-	< 0.0040	<0.004	<0.001	<0.001	-	< 0.0040	< 0.0040	-
Styrene	**0.8**	0.72	0.072	FW			-	< 0.00050	-	< 0.00050	< 0.00050	<0.0001	< 0.00050	<0.0005	<0.0005	<0.0005	-	< 0.00050	< 0.00050	-
Hydrocarbons																				
EPH (C10-C19)	**5**	5					<0.25	< 0.20	0.35	< 0.20	< 0.20	<0.25	< 0.20	<0.2	<0.1	<0.1	<0.25	< 0.20	< 0.20	<0.25
LEPH		0.5					-	< 0.20	0.35	< 0.20	< 0.20	<0.25	< 0.20	<0.2	<0.1	<0.1	<0.25	< 0.20	< 0.20	<0.25
EPH (C19-C32)							<0.25	< 0.20	<0.25	< 0.20	< 0.20	<0.25	< 0.20	<0.2	<0.1	<0.1	<0.25	< 0.20	< 0.20	<0.25
HEPH							-	< 0.20	<0.25	< 0.20	< 0.20	<0.25	< 0.20	<0.2	<0.1	<0.1	<0.25	< 0.20	< 0.20	<0.25
Volatile Hydrocarbons (VH6-10)	**15**	15					-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	<0.3	<0.1	<0.1	-	< 0.3	< 0.3	-
VPH (C6-C10)		1.5					-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	<0.3	<0.1	<0.1	-	< 0.3	< 0.3	-
F2			1.3												-	-				
F3															-	-				
F4															-	-				
Polycyclic Aromatic Hydrocarbons																				
Acenaphthene	**0.25**	0.06	0.0058	FW			-	< 0.000050	0.00016	< 0.000050	< 0.000050	<0.0001	< 0.000050	<0.00005	<0.00002	<0.00002	<0.0001	< 0.000050	< 0.000050	<0.0001
Acenaphthylene			0.046	FW			-	< 0.000050	<0.0001	< 0.000050	< 0.000050	<0.0001	< 0.000050	<0.00005	<0.00002	<0.00002	<0.0001	< 0.000050	< 0.000050	<0.0001
Acridine		0.0005	0.00005	FW			-	< 0.000050	<0.000005	< 0.000050	< 0.000050	<0.000005	< 0.000050	<0.00005	<0.00005	<0.00005	<0.000005	< 0.000050	< 0.000050	<0.000005
Anthracene	**1**	0.001	0.000012	FW			-	< 0.000010	<0.000001	< 0.000010	< 0.000010	<0.000001	< 0.000010	<0.00001	<0.00001	<0.00001	<0.000001	< 0.000010	< 0.000010	<0.000001
Benz(a)anthracene	**0.00007**	0.001	0.000018	FW			-	< 0.000010	<0.00001	< 0.000010	< 0.000010	<0.00001	< 0.000010	<0.00001	<0.00001	<0.00001	<0.00001	< 0.000010	< 0.000010	<0.00001
Benzo(a)pyrene	**0.00001**	0.0001	0.000017	FW	0.00001		-	< 0.0000090	<0.00001	< 0.0000090	< 0.0000090	<0.00001	< 0.0000090	<0.000005	<0.00001	<0.00001	<0.00001	< 0.0000090	< 0.0000090	<0.00001
Benzo(b)fluoranthene							-	-	<0.00001	-	-	<0.00001	-	-	<0.00001	<0.00001	<0.00001	-	-	<0.00001
Benzo(g,h,i)perylene			0.00021	FW			-	< 0.000050	<0.00001	< 0.000050	< 0.000050	<0.00001	< 0.000050	<0.00005	<0.00001	<0.00001	<0.00001	< 0.000050	< 0.000050	<0.00001
Benzo(j)fluoranthene															<0.00001	<0.00001				
Benzo(k)fluoranthene			0.00048	FW			-	< 0.000050	<0.00001	< 0.000050	< 0.000050	<0.00001	< 0.000050	<0.00005	<0.00001	<0.00001	<0.00001	< 0.000050	< 0.000050	<0.00001
Chrysene	**0.007**	0.001	0.0014	FW			-	< 0.000050	<0.00001	< 0.000050	< 0.000050	<0.00001	< 0.000050	<0.00005	<0.00001	<0.00001	<0.00001	< 0.000050	< 0.000050	<0.00001
Dibenz(a,h)anthracene	**0.00001**		0.00028	FW			-	*< 0.000050*	*<0.00001*	*< 0.000050*	*< 0.000050*	*<0.00001*	*< 0.000050*	<0.000003	<0.00001	<0.00001	*<0.00001*	*< 0.000050*	*< 0.000050*	*<0.00001*
Fluoranthene	**0.15**	0.002	0.00048	FW			-	< 0.0000020	<0.00004	< 0.0000020	< 0.0000020	<0.00004	< 0.0000020	<0.00002	<0.00002	<0.00002	<0.00004	< 0.0000020	< 0.0000020	<0.00004
Benzo(b,j) fluoranthene	**0.00007**		0.00004	FW			-	*< 0.000050*	-	*< 0.000050*	*< 0.000050*	-	*< 0.000050*	<0.00003	<0.00001	<0.00001	-	*< 0.000050*	*< 0.000050*	-
Fluorene	**0.15**	0.12	0.003	FW			-	< 0.000050	<0.000005	< 0.000050	< 0.000050	<0.000005	< 0.000050	<0.00005	<0.00002	<0.00002	<0.000005	< 0.000050	< 0.000050	<0.000005
Indeno(1,2,3-c,d)pyrene			0.00023	FW			-	< 0.000050	<0.00001	< 0.000050	< 0.000050	<0.00001	< 0.000050	<0.00005	<0.00001	<0.00001	<0.00001	< 0.000050	< 0.000050	<0.00001
Naphthalene	**0.08**	0.01	0.0011	FW			-	< 0.00010	<0.0003	< 0.00010	< 0.00010	<0.0003	< 0.00010	0.00012	<0.00005	<0.00005	<0.0003	< 0.00010	< 0.00010	<0.0003
Phenanthrene		0.003	0.0004	FW			-	< 0.000050	<0.000005	< 0.000050	< 0.000050	<0.000005	< 0.000050	<0.00005	<0.00004	<0.00004	<0.000005	< 0.000050	< 0.000050	0.00007
Pyrene	**0.1**	0.0002	0.000025	FW			-	< 0.000020	0.00002	< 0.000020	< 0.000020	<0.00002	< 0.000020	<0.00002	<0.00002	<0.00002	<0.00002	< 0.000020	< 0.000020	<0.00002
Quinoline	**0.00005**	0.034	0.0034	FW			-	*< 0.00024*	*<0.0005*	*< 0.00024*	*< 0.00024*	*<0.0005*	*< 0.00024*	<0.00002	*<0.0001*	*<0.0001*	*<0.0005*	*< 0.00024*	*< 0.00024*	*<0.0005*
2-methylnaphthalene	**0.015**		0.18				-	< 0.00010	-	< 0.00010	< 0.00010	-	< 0.00010	<0.0001	<0.00005	<0.00005	-	< 0.00010	< 0.00010	-
1-Methylnaphthalene	**0.0055**		0.18				-	-	-	-	-	-	-	-	<0.00005	<0.00005	-	-	-	-
PAH, Low Molecular Weight							-	< 0.00024	0.00016	< 0.00024	< 0.00024	-	< 0.00024	0.00012	-	-	-	< 0.00024	< 0.00024	0.00007
PAH, High Molecular Weight							-	< 0.000050	0.00002	< 0.000050	< 0.000050	-	< 0.000050	<0.00005	-	-	-	< 0.000050	< 0.000050	-
Total PAH							-	< 0.00024	0.00018	< 0.00024	< 0.00024	-	< 0.00024	0.00012	-	-	-	< 0.00024	< 0.00024	0.00007

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.

Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied

AO = Aesthetic Objective; OG = Operational Guideline
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
PAHs = polycyclic aromatic hydrocarbons
EPH (C10-C19) = extractable petroleum hydrocarbons, carbon range 10-19; LEPH = light extractable petroleum hydrocarbons
EPH (C19-C32) = extractable petroleum hydrocarbons, carbon range 19-32; HEPH = heavy extractable petroleum hydrocarbons
VH (C6-C10) = volatile hydrocarbons, carbon range 6-10; VPH = volatile petroleum hydrocarbons

Table 19
Results of Groundwater Analyses - Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19A-09MW-09	K19A-09MW-09	K19-09MW-09	K19A-09MW-10	K19-10MW-10	K19A-09MW-11	K19A-10MW-02	K19A-10MW-02	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	K19A-10MW-04
Sample Control Number							K19A-09MW-09	06706-03	03816-01	K19A-09MW-10	03816-05	-	K19A-10MW-02	K19A-10MW-02	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	SAMPLE E	06690-02	K19A-10MW-04
Laboratory ID							B650178	B710365	17N242036	B650178	17N242036	101110157	B085207	B648291	B078852	B085207	B650178	B650178	B710365	B086989
Date Sampled							16-Jun-16	8-Feb-17	21-Jul-17	16-Jun-16	21-Jul-17	7-Nov-09	12-Sep-10	10-Jun-16	26-Aug-10	12-Sep-10	16-Jun-16	16-Jun-16	7-Feb-17	13-Sep-10
QA/QC											FDA						FDA	FD		
APEC/ AEC							7b, 23a	7b, 23a	7b, 23a	1c	1c									
Non-Halogenated Volatiles																				
Benzene	**0.005**	0.4	0.088	L	0.005		< 0.00040	<0.0004	<0.0005	< 0.00040	0.0007	-	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	< 0.00040	<0.0004	<0.0005
Ethylbenzene	**0.14**	2	3.2	L	0.0016	AO	< 0.00040	<0.0004	<0.0005	< 0.00040	<0.0005	-	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	< 0.00040	<0.0004	<0.0005
Toluene	**0.06**	0.005	4.9	L	0.024	AO	< 0.00040	<0.0004	<0.0005	< 0.00040	<0.0005	-	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	< 0.00040	<0.0004	<0.0005
Xylenes	**0.09**	0.3	13	L	0.02	AO	< 0.00040	<0.0004	<0.001	< 0.00040	0.002	-	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	< 0.00040	<0.0004	<0.001
ortho-Xylene							< 0.00040	<0.0004	<0.0005	< 0.00040	0.0008	-	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	< 0.00040	<0.0004	<0.0005
meta- & para-Xylene							< 0.00040	<0.0004	<0.0005	< 0.00040	0.0012	-	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	< 0.00040	<0.0004	<0.001
Methyl t-butyl ether (MTBE)	**0.095**	34	6.1	I	0.015	AO	< 0.0040	<0.004	<0.001	< 0.0040	<0.001	-	<0.004	< 0.0040	<0.004	<0.004	< 0.0040	< 0.0040	<0.004	<0.004
Styrene	**0.8**	0.72	0.072	FW			< 0.00050	<0.0005	<0.0005	< 0.00050	<0.0005	-	<0.0004	< 0.00050	<0.0004	<0.0004	< 0.00050	< 0.00050	<0.0005	<0.0005
Hydrocarbons																				
EPH (C10-C19)	**5**	5					< 0.20	<0.2	-	< 0.20	-	0.45	<0.08	< 0.20	<0.08	<0.08	< 0.20	< 0.20	<0.2	0.37
LEPH		0.5					< 0.20	<0.2	-	< 0.20	-	0.44	<0.08	< 0.20	<0.08	<0.08	< 0.20	< 0.20	<0.2	0.37
EPH (C19-C32)							< 0.20	<0.2	-	< 0.20	-	<0.25	<0.08	< 0.20	<0.08	<0.08	< 0.20	< 0.20	<0.2	<0.08
HEPH							< 0.20	<0.2	-	< 0.20	-	<0.25	<0.08	< 0.20	<0.08	<0.08	< 0.20	< 0.20	<0.2	<0.08
Volatile Hydrocarbons (VH6-10)	**15**	15					< 0.3	<0.3	<0.1	< 0.3	<0.1	-	<0.3	< 0.3	<0.3	<0.3	< 0.3	< 0.3	<0.3	<0.3
VPH (C6-C10)		1.5					< 0.3	<0.3	<0.1	< 0.3	<0.1	-	<0.3	< 0.3	<0.3	<0.3	< 0.3	< 0.3	<0.3	<0.3
F2			1.3						-		<0.1									
F3									-		0.23									
F4									-		<0.1									
Polycyclic Aromatic Hydrocarbons																				
Acenaphthene	**0.25**	0.06	0.0058	FW			< 0.000050	<0.00005	<0.00002	< 0.000050	0.00002	<0.0001	<0.00001	< 0.000050	<0.00001	<0.00001	< 0.000050	< 0.000050	<0.00005	0.00021
Acenaphthylene			0.046	FW			< 0.000050	<0.00005	<0.00002	< 0.000050	<0.00002	<0.0001	<0.00001	< 0.000050	<0.00001	<0.00001	< 0.000050	< 0.000050	<0.00005	<0.00001
Acridine		0.0005	0.00005	FW			< 0.000050	<0.00005	<0.00005	< 0.000050	<0.00005	<0.000005	<0.00005	< 0.000050	<0.00005	<0.00005	< 0.000050	< 0.000050	<0.00005	<0.00005
Anthracene	**1**	0.001	0.000012	FW			< 0.000010	<0.00001	<0.00001	< 0.000010	<0.00001	0.00001	<0.00001	< 0.000010	<0.00001	<0.00001	< 0.000010	< 0.000010	<0.00001	<0.00001
Benz(a)anthracene	**0.00007**	0.001	0.000018	FW			< 0.000010	<0.00001	<0.00001	< 0.000010	<0.00001	<0.00001	<0.00001	< 0.000010	<0.00001	<0.00001	< 0.000010	< 0.000010	<0.00001	<0.00001
Benzo(a)pyrene	**0.00001**	0.0001	0.000017	FW	0.00001		< 0.0000090	<0.000005	<0.00001	< 0.0000090	<0.00001	<0.00001	<0.00001	< 0.0000090	<0.00001	<0.00001	< 0.0000090	< 0.0000090	<0.000009	<0.00001
Benzo(b)fluoranthene							-	-	<0.00001	-	<0.00001	<0.00001	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene			0.00021	FW			< 0.000050	<0.00005	<0.00001	< 0.000050	<0.00001	<0.00001	<0.00002	< 0.000050	<0.00002	<0.00002	< 0.000050	< 0.000050	<0.00005	<0.00002
Benzo(j)fluoranthene									<0.00001		<0.00001									
Benzo(k)fluoranthene			0.00048	FW			< 0.000050	<0.00005	<0.00001	< 0.000050	<0.00001	<0.00001	<0.00001	< 0.000050	<0.00001	<0.00001	< 0.000050	< 0.000050	<0.00005	<0.00001
Chrysene	**0.007**	0.001	0.0014	FW			< 0.000050	<0.00005	<0.00001	< 0.000050	<0.00001	<0.00001	0.000013	< 0.000050	<0.00001	<0.00001	< 0.000050	< 0.000050	<0.00005	<0.00001
Dibenz(a,h)anthracene	**0.00001**		0.00028	FW			*< 0.000050*	<0.000003	<0.00001	*< 0.000050*	<0.00001	*<0.00001*	*<0.00002*	*< 0.000050*	*<0.00002*	*<0.00002*	*< 0.000050*	*< 0.000050*	<0.000006	*<0.00002*
Fluoranthene	**0.15**	0.002	0.00048	FW			< 0.000020	<0.00002	<0.00002	< 0.000020	0.00003	<0.00004	<0.00001	< 0.000020	<0.00001	<0.00001	< 0.000020	< 0.000020	<0.00002	<0.00001
Benzo(b,j) fluoranthene	**0.00007**		0.00004	FW			*< 0.000050*	<0.00003	<0.00001	*< 0.000050*	<0.00001	-	<0.00001	*< 0.000050*	<0.00001	<0.00001	*< 0.000050*	*< 0.000050*	*<0.00005*	<0.00001
Fluorene	**0.15**	0.12	0.003	FW			< 0.000050	<0.00005	<0.00002	< 0.000050	0.00002	0.00051	0.000032	< 0.000050	<0.00001	<0.00001	< 0.000050	< 0.000050	<0.00005	0.00042
Indeno(1,2,3-c,d)pyrene			0.00023	FW			< 0.000050	<0.00005	<0.00001	< 0.000050	<0.00001	<0.00001	<0.00002	< 0.000050	<0.00002	<0.00002	< 0.000050	< 0.000050	<0.00005	<0.00002
Naphthalene	**0.08**	0.01	0.0011	FW			< 0.00010	<0.0001	<0.00005	< 0.00010	0.00065	0.0051	0.0001	< 0.00010	<0.00005	<0.00005	< 0.00010	< 0.00010	<0.0001	0.00053
Phenanthrene		0.003	0.0004	FW			< 0.000050	<0.00005	<0.00004	< 0.000050	0.00014	0.00014	0.00007	< 0.000050	0.000017	0.000012	< 0.000050	< 0.000050	<0.00005	0.00016
Pyrene	**0.1**	0.0002	0.000025	FW			< 0.000020	<0.00002	<0.00002	< 0.000020	<0.00002	<0.00002	<0.00002	< 0.000020	<0.00001	<0.00001	< 0.000020	< 0.000020	<0.00002	<0.00001
Quinoline	**0.00005**	0.034	0.0034	FW			*< 0.00024*	<0.00002	*<0.0001*	*< 0.00024*	*<0.0001*	*<0.0005*	<0.00005	*< 0.00024*	<0.00005	<0.00005	*< 0.00024*	*< 0.00024*	<0.00004	*<0.00005*
2-methylnaphthalene	**0.015**		0.18				< 0.00010	<0.0001	<0.00005	< 0.00010	0.00046	-	0.00022	< 0.00010	<0.00005	<0.00005	< 0.00010	< 0.00010	<0.0001	0.00018
1-Methylnaphthalene	**0.0055**		0.18				-	-	<0.00005	-	0.00042	-	-	-	-	-	-	-	-	-
PAH, Low Molecular Weight							< 0.00024	<0.0001	-	< 0.00024	-	0.00576	0.00042	< 0.00024	<0.00005	<0.00005	< 0.00024	< 0.00024	<0.0001	0.0015
PAH, High Molecular Weight							< 0.000050	<0.00005	-	< 0.000050	-	-	<0.00002	< 0.000050	<0.00002	<0.00002	< 0.000050	< 0.000050	<0.00005	<0.00002
Total PAH							< 0.00024	<0.0001	-	< 0.00024	-	0.00576	0.00043	< 0.00024	<0.00005	<0.00005	< 0.00024	< 0.00024	<0.0001	0.0015

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.

Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied

AO = Aesthetic Objective; OG = Operational Guideline
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
PAHs = polycyclic aromatic hydrocarbons
EPH (C10-C19) = extractable petroleum hydrocarbons, carbon range 10-19; LEPH = light extractable petroleum hydrocarbons
EPH (C19-C32) = extractable petroleum hydrocarbons, carbon range 19-32; HEPH = heavy extractable petroleum hydrocarbons
VH (C6-C10) = volatile hydrocarbons, carbon range 6-10; VPH = volatile petroleum hydrocarbons

Table 19
Results of Groundwater Analyses - Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19A-10MW-04	K19A-10MW-05	K19A-10MW-05	K19A-10MW-06	K19A-10MW-07	K19A-10MW-07	K19A-10MW-09	K19A-10MW-09	K19A-10MW-10	K19A-10MW-10	K19A-10MW10	K19-10MW-10	K19A-10MW-19
Sample Control Number							K19A-10MW-04	K19A-10MW-05	K19A-10MW-05	K19A-10MW-06	K19A-10MW-07	K19A-10MW-07	K19A-10MW-09	K19A-10MW-09	DUP-02	K19A-10MW-10	K19A-10MW-10	03375-04	03816-06	K19A-10MW-19
Laboratory ID							B648667	B085207	B646703	B086989	B085207	B646703	B086989	B646703	B086989	B086989	B646703	B709734	17N242036	B085207
Date Sampled							15-Jun-16	11-Sep-10	7-Jun-16	13-Sep-10	11-Sep-10	7-Jun-16	13-Sep-10	7-Jun-16	13-Sep-10	13-Sep-10	8-Jun-16	4-Feb-17	21-Jul-17	10-Sep-10
QA/QC															FD	FDA			FD	
APEC/ AEC															1c	1c	1c	1c	1c	
Non-Halogenated Volatiles																				
Benzene	**0.005**	0.4	0.088	L	0.005		< 0.00040	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	<0.0004	< 0.00040	<0.0017	0.0012	0.00072	0.0017	0.0008	<0.0004
Ethylbenzene	**0.14**	2	3.2	L	0.0016	AO	< 0.00040	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	<0.0004	< 0.00040	0.00068	0.00061	< 0.00040	<0.0004	<0.0005	<0.0004
Toluene	**0.06**	0.005	4.9	L	0.024	AO	< 0.00040	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	<0.0004	< 0.00040	0.00049	<0.0005	< 0.00040	<0.0004	<0.0005	<0.0004
Xylenes	**0.09**	0.3	13	L	0.02	AO	< 0.00040	<0.0004	< 0.00040	<0.0004	0.00052	< 0.00040	<0.0004	< 0.00040	0.016	0.0098	0.001	0.0043	0.002	<0.0004
ortho-Xylene							< 0.00040	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	<0.0004	< 0.00040	0.0054	0.003	0.00047	0.0014	0.0007	<0.0004
meta- & para-Xylene							< 0.00040	<0.0004	< 0.00040	<0.0004	0.00052	< 0.00040	<0.0004	< 0.00040	0.01	0.0068	0.00058	0.0029	0.0013	<0.0004
Methyl t-butyl ether (MTBE)	**0.095**	34	6.1	I	0.015	AO	< 0.0040	<0.004	< 0.0040	<0.004	<0.004	< 0.0040	<0.004	< 0.0040	<0.004	<0.004	< 0.0040	<0.004	<0.001	<0.004
Styrene	**0.8**	0.72	0.072	FW			< 0.00050	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	<0.0004	< 0.00040	<0.0004	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0004
Hydrocarbons																				
EPH (C10-C19)	**5**	5					< 0.20	<0.08	< 0.20	<0.08	<0.08	< 0.20	<0.08	< 0.20	0.09	0.43	2.7	<0.2	-	<0.08
LEPH		0.5					< 0.20	<0.08	< 0.20	<0.08	<0.08	< 0.20	<0.08	< 0.20	0.088	0.43	2.7	<0.2	-	<0.08
EPH (C19-C32)							< 0.20	<0.08	< 0.20	<0.08	<0.08	< 0.20	<0.08	< 0.20	<0.08	<0.08	3.7	<0.2	-	<0.08
HEPH							< 0.20	<0.08	< 0.20	<0.08	<0.08	< 0.20	<0.08	< 0.20	<0.08	<0.08	3.7	<0.2	-	<0.08
Volatile Hydrocarbons (VH6-10)	**15**	15					< 0.3	<0.3	< 0.3	<0.3	<0.3	< 0.3	<0.3	< 0.3	<0.3	<0.3	< 0.3	<0.3	<0.1	<0.3
VPH (C6-C10)		1.5					< 0.3	<0.3	< 0.3	<0.3	<0.3	< 0.3	<0.3	< 0.3	<0.3	<0.3	< 0.3	<0.3	<0.1	<0.3
F2			1.3																<0.1	
F3																			0.19	
F4																			<0.1	
Polycyclic Aromatic Hydrocarbons																				
Acenaphthene	**0.25**	0.06	0.0058	FW			< 0.000050	<0.00001	< 0.000050	<0.00001	<0.00001	< 0.000050	<0.00001	< 0.000050	0.000036	0.000035	< 0.000050	<0.00005	0.00002	<0.00001
Acenaphthylene			0.046	FW			< 0.000050	<0.00001	< 0.000050	<0.00001	<0.00001	< 0.000050	<0.00001	< 0.000050	<0.00003	<0.00003	< 0.000050	<0.00005	<0.00002	<0.00001
Acridine		0.0005	0.00005	FW			< 0.000050	<0.00005	< 0.000050	<0.00005	<0.00005	< 0.000050	<0.00005	< 0.000050	<0.00005	<0.00005	< 0.000050	<0.00005	<0.00005	<0.00005
Anthracene	**1**	0.001	0.000012	FW			< 0.000010	<0.00001	< 0.000010	<0.00001	<0.00001	< 0.000010	<0.00001	< 0.000010	<0.00001	<0.00001	< 0.000010	<0.00001	<0.00001	<0.00001
Benz(a)anthracene	**0.00007**	0.001	0.000018	FW			< 0.000010	<0.00001	< 0.000010	<0.00001	<0.00001	< 0.000010	<0.00001	< 0.000010	<0.00001	<0.00001	< 0.000010	<0.00001	<0.00001	<0.00001
Benzo(a)pyrene	**0.00001**	0.0001	0.000017	FW	0.00001		< 0.0000090	<0.00001	< 0.0000090	<0.00001	<0.00001	< 0.0000090	<0.00001	< 0.0000090	<0.00001	<0.00001	< 0.0000090	<0.000009	<0.00001	<0.00001
Benzo(b)fluoranthene							-	-	-	-	-	-	-	-	-	-	-	-	<0.00001	-
Benzo(g,h,i)perylene			0.00021	FW			< 0.000050	<0.00002	< 0.000050	<0.00002	<0.00002	< 0.000050	<0.00002	< 0.000050	<0.00002	<0.00002	< 0.000050	<0.00005	<0.00001	<0.00002
Benzo(j)fluoranthene																			<0.00001	
Benzo(k)fluoranthene			0.00048	FW			< 0.000050	<0.00001	< 0.000050	<0.00001	<0.00001	< 0.000050	<0.00001	< 0.000050	<0.00001	<0.00001	< 0.000050	<0.00005	<0.00001	<0.00001
Chrysene	**0.007**	0.001	0.0014	FW			< 0.000050	<0.00001	< 0.000050	<0.00001	<0.00001	< 0.000050	<0.00001	< 0.000050	<0.00001	<0.00001	< 0.000050	<0.00005	<0.00001	0.000016
Dibenz(a,h)anthracene	**0.00001**		0.00028	FW			*< 0.000050*	*<0.00002*	*< 0.000050*	*<0.00002*	*<0.00002*	*< 0.000050*	*<0.00002*	*< 0.000050*	*<0.00002*	*<0.00002*	*< 0.000050*	<0.000006	<0.00001	*<0.00002*
Fluoranthene	**0.15**	0.002	0.00048	FW			< 0.000020	<0.00001	< 0.000020	<0.00001	<0.00001	< 0.000020	<0.00001	< 0.000020	<0.00001	<0.00001	< 0.000020	<0.00002	0.00002	<0.00001
Benzo(b,j) fluoranthene	**0.00007**		0.00004	FW			*< 0.000050*	<0.00001	*< 0.000050*	<0.00001	<0.00001	*< 0.000050*	<0.00001	*< 0.000050*	<0.00001	<0.00001	*< 0.000050*	*<0.00005*	<0.00001	<0.00001
Fluorene	**0.15**	0.12	0.003	FW			< 0.000050	0.000011	< 0.000050	<0.00001	<0.00001	< 0.000050	<0.00001	< 0.000050	0.0001	0.00011	< 0.000050	<0.00005	<0.00002	0.000061
Indeno(1,2,3-c,d)pyrene			0.00023	FW			< 0.000050	<0.00002	< 0.000050	<0.00002	<0.00002	< 0.000050	<0.00002	< 0.000050	<0.00002	<0.00002	< 0.000050	<0.00005	<0.00001	<0.00002
Naphthalene	**0.08**	0.01	0.0011	FW			< 0.00010	<0.00005	< 0.00010	<0.00005	0.000052	< 0.00010	<0.00005	< 0.00010	0.0021	0.0022	0.0004	0.0017	0.00072	0.0004
Phenanthrene		0.003	0.0004	FW			< 0.000050	0.000026	< 0.000050	<0.00001	0.000015	< 0.000050	<0.00001	< 0.000050	0.000061	0.00007	< 0.000050	<0.00005	0.00009	0.00014
Pyrene	**0.1**	0.0002	0.000025	FW			< 0.000020	<0.00001	< 0.000020	<0.00001	<0.00001	< 0.000020	<0.00001	< 0.000020	<0.00001	<0.00001	< 0.000020	<0.00002	<0.00002	<0.00002
Quinoline	**0.00005**	0.034	0.0034	FW			*< 0.00024*	*<0.00005*	*< 0.00024*	<0.00005	<0.00005	*< 0.00024*	<0.00005	*< 0.00024*	*<0.00009*	*<0.0001*	*< 0.00024*	<0.00004	<0.0001	<0.00005
2-methylnaphthalene	**0.015**		0.18				< 0.00010	0.000074	< 0.00010	<0.00005	0.000067	< 0.00010	<0.00005	< 0.00010	0.0037	0.0039	0.00015	0.0019	0.00049	0.00056
1-Methylnaphthalene	**0.0055**		0.18				-	-	-	-	-	-	-	-	-	-	-	-	0.00046	-
PAH, Low Molecular Weight							< 0.00024	0.00011	< 0.00024	<0.00005	0.00013	< 0.00024	<0.00005	< 0.00024	0.006	0.0063	0.00054	0.0036	-	0.0012
PAH, High Molecular Weight							< 0.000050	<0.00002	< 0.000050	<0.00002	<0.00002	< 0.000050	<0.00002	< 0.000050	<0.00002	<0.00002	< 0.000050	<0.00005	-	<0.00002
Total PAH							< 0.00024	0.00011	< 0.00024	<0.00005	0.00013	< 0.00024	<0.00005	< 0.00024	0.006	0.0063	0.00054	0.0036	-	0.0012

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.

Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied

AO = Aesthetic Objective; OG = Operational Guideline
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
PAHs = polycyclic aromatic hydrocarbons
EPH (C10-C19) = extractable petroleum hydrocarbons, carbon range 10-19; LEPH = light extractable petroleum hydrocarbons
EPH (C19-C32) = extractable petroleum hydrocarbons, carbon range 19-32; HEPH = heavy extractable petroleum hydrocarbons
VH (C6-C10) = volatile hydrocarbons, carbon range 6-10; VPH = volatile petroleum hydrocarbons

Table 19
Results of Groundwater Analyses - Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19A-10MW-19	K19A-10MW-20	K19A-10MW-20	K19A-10MW-20	K19A-10MW-21	K19A-10MW-21	K19A-10MW-21	K19A-10MW-22	K19A-10MW-22	K19A-10MW-24	K19A-10MW-24	K19A-10MW-24
Sample Control Number							K19A-10MW-19	K19A-10MW-20	K19A-10MW-20	06689-02	K19A-10MW-21	K19A-10MW-21	06689-03	K19A-10MW-22	K19A-10MW22	K19A-10MW-24	06689-04	06689-05
Laboratory ID							B648667	B085207	B650178	B709775	B085207	B650178	B709775	B085207	B650178	B091490	B709775	B709775
Date Sampled							13-Jun-16	11-Sep-10	16-Jun-16	5-Feb-17	10-Sep-10	16-Jun-16	5-Feb-17	12-Sep-10	16-Jun-16	17-Sep-10	6-Feb-17 FDA	6-Feb-17 FD
QA/QC																		
APEC/ AEC																		
Non-Halogenated Volatiles																		
Benzene	**0.005**	0.4	0.088	L	0.005		< 0.00040	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	<0.0004	<0.0004	<0.0004
Ethylbenzene	**0.14**	2	3.2	L	0.0016	AO	< 0.00040	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	<0.0004	<0.0004	<0.0004
Toluene	**0.06**	0.005	4.9	L	0.024	AO	< 0.00040	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	<0.0004	<0.0004	<0.0004
Xylenes	**0.09**	0.3	13	L	0.02	AO	< 0.00040	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	<0.0004	<0.0004	<0.0004
ortho-Xylene							< 0.00040	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	-	<0.0004	<0.0004
meta- & para-Xylene							< 0.00040	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	-	<0.0004	<0.0004
Methyl t-butyl ether (MTBE)	**0.095**	34	6.1	I	0.015	AO	< 0.0040	<0.004	< 0.0040	<0.004	<0.004	< 0.0040	<0.004	<0.004	< 0.0040	-	<0.004	<0.004
Styrene	**0.8**	0.72	0.072	FW			< 0.00050	<0.0004	< 0.00050	<0.0005	<0.0004	< 0.00050	<0.0005	<0.0004	< 0.00040	-	<0.0005	<0.0005
Hydrocarbons																		
EPH (C10-C19)	**5**	5					< 0.20	<0.08	< 0.20	<0.2	0.09	< 0.20	0.49	<0.08	< 0.20	<0.08	<0.2	<0.2
LEPH		0.5					< 0.20	<0.08	< 0.20	<0.2	0.089	< 0.20	0.49	<0.08	< 0.20	<0.08	<0.2	<0.2
EPH (C19-C32)							< 0.20	<0.08	< 0.20	<0.2	<0.08	< 0.20	<0.2	<0.08	< 0.20	<0.08	<0.2	<0.2
HEPH							< 0.20	<0.08	< 0.20	<0.2	<0.08	< 0.20	<0.2	<0.08	< 0.20	<0.08	<0.2	<0.2
Volatile Hydrocarbons (VH6-10)	**15**	15					< 0.3	<0.3	< 0.3	<0.3	<0.3	< 0.3	<0.3	<0.3	< 0.3	-	<0.3	<0.3
VPH (C6-C10)		1.5					< 0.3	<0.3	< 0.3	<0.3	<0.3	< 0.3	<0.3	<0.3	< 0.3	-	<0.3	<0.3
F2			1.3															
F3																		
F4																		
Polycyclic Aromatic Hydrocarbons																		
Acenaphthene	**0.25**	0.06	0.0058	FW			< 0.000050	<0.00001	< 0.000050	<0.00005	0.000015	< 0.000050	<0.00005	<0.00001	< 0.000050	<0.00001	<0.00005	<0.00005
Acenaphthylene			0.046	FW			< 0.000050	<0.00001	< 0.000050	<0.00005	<0.00002	< 0.000050	<0.00005	<0.00001	< 0.000050	<0.00001	<0.00005	<0.00005
Acridine		0.0005	0.00005	FW			< 0.000050	<0.00005	< 0.000050	<0.00005	<0.00005	< 0.000050	<0.00005	<0.00005	< 0.000050	<0.00005	<0.00005	<0.00005
Anthracene	**1**	0.001	0.000012	FW			< 0.000010	<0.00001	< 0.000010	<0.00001	<0.00001	< 0.000010	<0.00001	<0.00001	< 0.000010	<0.00001	<0.00001	<0.00001
Benz(a)anthracene	**0.00007**	0.001	0.000018	FW			< 0.000010	<0.00001	< 0.000010	<0.00001	<0.00001	< 0.000010	<0.00001	<0.00001	< 0.000010	<0.00001	<0.00001	<0.00001
Benzo(a)pyrene	**0.00001**	0.0001	0.000017	FW	0.00001		< 0.0000090	<0.00001	< 0.0000090	<0.000009	<0.00001	< 0.0000090	<0.000009	<0.00001	< 0.0000090	<0.00001	<0.000009	<0.000009
Benzo(b)fluoranthene							-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene			0.00021	FW			< 0.000050	<0.00002	< 0.000050	<0.00005	<0.00002	< 0.000050	<0.00005	<0.00002	< 0.000050	<0.00002	<0.00005	<0.00005
Benzo(j)fluoranthene																		
Benzo(k)fluoranthene			0.00048	FW			< 0.000050	<0.00001	< 0.000050	<0.00005	<0.00001	< 0.000050	<0.00005	<0.00001	< 0.000050	<0.00001	<0.00005	<0.00005
Chrysene	**0.007**	0.001	0.0014	FW			< 0.000050	<0.00001	< 0.000050	<0.00005	0.000017	< 0.000050	<0.00005	<0.00001	< 0.000050	<0.00001	<0.00005	<0.00005
Dibenz(a,h)anthracene	**0.00001**		0.00028	FW			*< 0.000050*	*<0.00002*	*< 0.000050*	<0.000006	*<0.00002*	*< 0.000050*	<0.000006	*<0.00002*	*< 0.000050*	*<0.00002*	<0.000006	<0.000006
Fluoranthene	**0.15**	0.002	0.00048	FW			< 0.000020	<0.00001	< 0.000020	<0.00002	<0.00001	< 0.000020	<0.00002	<0.00001	< 0.000020	<0.00001	<0.00002	<0.00002
Benzo(b,j) fluoranthene	**0.00007**		0.00004	FW			*< 0.000050*	<0.00001	*< 0.000050*	*<0.00005*	<0.00001	*< 0.000050*	*<0.00005*	<0.00001	*< 0.000050*	<0.00001	*<0.00005*	*<0.00005*
Fluorene	**0.15**	0.12	0.003	FW			< 0.000050	0.000014	< 0.000050	<0.00005	0.000064	< 0.000050	<0.00005	<0.00001	< 0.000050	<0.00001	<0.00005	<0.00005
Indeno(1,2,3-c,d)pyrene			0.00023	FW			< 0.000050	<0.00002	< 0.000050	<0.00005	<0.00002	< 0.000050	<0.00005	<0.00002	< 0.000050	<0.00002	<0.00005	<0.00005
Naphthalene	**0.08**	0.01	0.0011	FW			< 0.00010	0.00014	< 0.00010	<0.0001	0.00037	< 0.00010	<0.0001	0.000087	< 0.00010	0.00005	<0.0001	<0.0001
Phenanthrene		0.003	0.0004	FW			< 0.000050	0.000015	< 0.000050	<0.00005	0.00011	< 0.000050	<0.00005	0.000016	< 0.000050	0.000015	<0.00005	<0.00005
Pyrene	**0.1**	0.0002	0.000025	FW			< 0.000020	<0.00001	< 0.000020	<0.00002	<0.00002	< 0.000020	<0.00002	<0.00001	< 0.000020	<0.00001	<0.00002	<0.00002
Quinoline	**0.00005**	0.034	0.0034	FW			*< 0.00024*	<0.00005	*< 0.00024*	<0.00004	<0.00005	*< 0.00024*	<0.00004	<0.00005	*< 0.00024*	<0.00005	<0.00004	<0.00004
2-methylnaphthalene	**0.015**		0.18				< 0.00010	0.00011	< 0.00010	<0.0001	0.00051	< 0.00010	<0.0001	0.000068	< 0.00010	0.000054	<0.0001	<0.0001
1-Methylnaphthalene	**0.0055**		0.18				-	-	-	-	-	-	-	-	-	-	-	-
PAH, Low Molecular Weight							< 0.00024	0.00028	< 0.00024	<0.0001	0.0011	< 0.00024	<0.0001	0.00017	< 0.00024	0.00012	<0.0001	<0.0001
PAH, High Molecular Weight							< 0.000050	<0.00002	< 0.000050	<0.00005	<0.00002	< 0.000050	<0.00005	<0.00002	< 0.000050	<0.00002	<0.00005	<0.00005
Total PAH							< 0.00024	0.00028	< 0.00024	<0.0001	0.0011	< 0.00024	<0.0001	0.00017	< 0.00024	0.00012	<0.0001	<0.0001

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Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied

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K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19-10MW-24	K19A-10MW-25	K19A-10MW-25	K19A-10MW-25	K19A-10MW-26	K19A-10MW-26	K19A-10MW-27	K19A-10MW-27	K19A-10MW-28	K19A-10MW-28	K19A-10MW-28	K19A-10MW-28	K19A-10MW-29	K19A-10MW-29	K19B-09MW-01	K19B-09MW-01
Sample Control Number							03816-04	DUP-03	K19A-10MW-25	K19A-10MW-25	K19A-10MW-26	K19A-10MW-26	K19A-10MW-27	K19A-10MW-27	K19A-10MW-28	K19A-10MW-28	MWB	06690-03	K19A-10MW-29	K19A-10MW-29	-	K19B-09MW-01
Laboratory ID							17N242036	B086989	B086989	B648291	B086989	B648291	B091490	B648291	B086989	B646703	B646703	B710365	B646703	B648291	101105151	B083804
Date Sampled							21-Jul-17	13-Sep-10	13-Sep-10	10-Jun-16	13-Sep-10	11-Jun-16	17-Sep-10	10-Jun-16	13-Sep-10	9-Jun-16	9-Jun-16	8-Feb-17	9-Jun-16	10-Jun-16	4-Nov-09	9-Sep-10
QA/QC								FD	FDA							FDA	FD					
APEC/ AEC																						
Non-Halogenated Volatiles																						
Benzene	**0.005**	0.4	0.088	L	0.005		-	<0.00067	<0.0004	< 0.00040	**0.007**	0.0019	<0.0004	< 0.00040	<0.0004	0.0006	0.00069	0.00092	-	**0.006**	<0.0001	<0.0004
Ethylbenzene	**0.14**	2	3.2	L	0.0016	AO	-	<0.0004	<0.0004	< 0.00040	0.0099	0.0016	<0.0004	< 0.00040	<0.0004	< 0.00040	< 0.00040	<0.0004	-	0.00066	<0.0001	<0.0004
Toluene	**0.06**	0.005	4.9	L	0.024	AO	-	<0.0004	<0.0004	< 0.00040	0.0017	0.00055	<0.0004	< 0.00040	<0.0004	< 0.00040	< 0.00040	<0.0004	-	0.00077	<0.0001	<0.0004
Xylenes	**0.09**	0.3	13	L	0.02	AO	-	0.0047	0.0052	< 0.00040	0.0081	0.0015	<0.0004	< 0.00040	0.005	< 0.00040	0.0004	<0.0004	-	0.00057	0.001	<0.0004
ortho-Xylene							-	0.0015	0.0016	< 0.00040	<0.0005	< 0.00040	-	< 0.00040	0.0018	< 0.00040	< 0.00040	<0.0004	-	< 0.00040	-	<0.0004
meta- & para-Xylene							-	0.0032	0.0036	< 0.00040	0.0081	0.0015	-	< 0.00040	0.0033	< 0.00040	0.0004	<0.0004	-	0.00057	-	<0.0004
Methyl t-butyl ether (MTBE)	**0.095**	34	6.1	I	0.015	AO	-	<0.004	<0.004	< 0.0040	<0.004	< 0.0040	-	< 0.0040	<0.004	< 0.0040	< 0.0040	<0.004	-	< 0.0040	-	<0.004
Styrene	**0.8**	0.72	0.072	FW			-	<0.0004	<0.0004	< 0.00040	<0.0005	< 0.00050	-	< 0.00040	<0.0004	< 0.00040	< 0.00040	<0.0005	-	< 0.00050	<0.0001	<0.0004
Hydrocarbons																						
EPH (C10-C19)	**5**	5					-	0.13	0.08	< 0.20	0.21	< 0.20	<0.08	< 0.20	<0.08	0.44	0.42	<0.2	1.2	-	<0.25	<0.08
LEPH		0.5					-	0.13	<0.08	< 0.20	0.2	< 0.20	<0.08	< 0.20	<0.08	0.44	0.42	<0.2	1.2	-	-	<0.08
EPH (C19-C32)							-	<0.08	<0.08	< 0.20	<0.08	< 0.20	<0.08	< 0.20	<0.08	< 0.20	< 0.20	<0.2	< 0.20	-	<0.25	<0.08
HEPH							-	<0.08	<0.08	< 0.20	<0.08	< 0.20	<0.08	< 0.20	<0.08	< 0.20	< 0.20	<0.2	< 0.20	-	-	<0.08
Volatile Hydrocarbons (VH6-10)	**15**	15					<0.1	<0.3	<0.3	< 0.3	<0.3	< 0.3	-	< 0.3	<0.3	< 0.3	< 0.3	<0.3	-	0.51	-	<0.3
VPH (C6-C10)		1.5					<0.1	<0.3	<0.3	< 0.3	<0.3	< 0.3	-	< 0.3	<0.3	< 0.3	< 0.3	<0.3	< 0.3	-	-	<0.3
F2			1.3				-															
F3							-															
F4							-															
Polycyclic Aromatic Hydrocarbons																						
Acenaphthene	**0.25**	0.06	0.0058	FW			<0.00002	0.000024	0.000026	< 0.000050	0.000022	< 0.000050	<0.00001	< 0.000050	0.000017	< 0.000050	< 0.000050	<0.00005	< 0.000050	-	-	<0.00001
Acenaphthylene			0.046	FW			<0.00002	<0.00003	<0.00003	< 0.000050	<0.00002	< 0.000050	<0.00001	< 0.000050	<0.00001	< 0.000050	< 0.000050	<0.00005	< 0.000050	-	-	<0.00001
Acridine		0.0005	0.00005	FW			<0.00005	<0.00005	<0.00005	< 0.000050	<0.00005	< 0.000050	<0.00005	< 0.000050	<0.00005	< 0.000050	< 0.000050	<0.00005	< 0.000050	-	-	<0.00005
Anthracene	**1**	0.001	0.000012	FW			<0.00001	<0.00001	<0.00001	< 0.000010	<0.00001	< 0.000010	<0.00001	< 0.000010	<0.00001	< 0.000010	< 0.000010	<0.00001	< 0.000010	-	-	<0.00001
Benz(a)anthracene	**0.00007**	0.001	0.000018	FW			<0.00001	<0.00001	<0.00001	< 0.000010	<0.00001	< 0.000010	<0.00001	< 0.000010	<0.00001	< 0.000010	< 0.000010	<0.00001	< 0.000010	-	-	<0.00001
Benzo(a)pyrene	**0.00001**	0.0001	0.000017	FW	0.00001		<0.00001	<0.00001	<0.00001	< 0.0000090	<0.00001	< 0.0000090	<0.00001	< 0.0000090	<0.00001	< 0.0000090	< 0.0000090	<0.000005	< 0.0000090	-	-	<0.00001
Benzo(b)fluoranthene							<0.00001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene			0.00021	FW			<0.00001	<0.00002	<0.00002	< 0.000050	<0.00002	< 0.000050	<0.00002	< 0.000050	<0.00002	< 0.000050	< 0.000050	<0.00005	< 0.000050	-	-	<0.00002
Benzo(j)fluoranthene							<0.00001															
Benzo(k)fluoranthene			0.00048	FW			<0.00001	<0.00001	<0.00001	< 0.000050	<0.00001	< 0.000050	<0.00001	< 0.000050	<0.00001	< 0.000050	< 0.000050	<0.00005	< 0.000050	-	-	<0.00001
Chrysene	**0.007**	0.001	0.0014	FW			<0.00001	<0.00001	<0.00001	< 0.000050	<0.00001	< 0.000050	<0.00001	< 0.000050	0.000016	< 0.000050	< 0.000050	<0.00005	< 0.000050	-	-	<0.00001
Dibenz(a,h)anthracene	**0.00001**		0.00028	FW			<0.00001	*<0.00002*	*<0.00002*	*< 0.000050*	*<0.00002*	*< 0.000050*	*<0.00002*	*< 0.000050*	*<0.00002*	*< 0.000050*	*< 0.000050*	<0.000003	*< 0.000050*	-	-	*<0.00002*
Fluoranthene	**0.15**	0.002	0.00048	FW			<0.00002	<0.00001	<0.00001	< 0.000020	<0.00001	< 0.000020	<0.00001	< 0.000020	<0.00001	< 0.000020	< 0.000020	<0.00002	< 0.000020	-	-	<0.00001
Benzo(b,j) fluoranthene	**0.00007**		0.00004	FW			<0.00001	<0.00001	<0.00001	*< 0.000050*	<0.00001	*< 0.000050*	<0.00001	*< 0.000050*	<0.00001	*< 0.000050*	*< 0.000050*	<0.00003	*< 0.000050*	-	-	<0.00001
Fluorene	**0.15**	0.12	0.003	FW			<0.00002	0.0001	0.00012	0.000053	0.000077	< 0.000050	<0.00001	< 0.000050	0.000029	0.00016	0.00014	<0.00005	< 0.000050	-	-	<0.00001
Indeno(1,2,3-c,d)pyrene			0.00023	FW			<0.00001	<0.00002	<0.00002	< 0.000050	<0.00002	< 0.000050	<0.00002	< 0.000050	<0.00002	< 0.000050	< 0.000050	<0.00005	< 0.000050	-	-	<0.00002
Naphthalene	**0.08**	0.01	0.0011	FW			<0.00005	0.0013	0.0013	0.00042	0.0091	0.0009	<0.00005	< 0.00010	0.00043	0.0011	0.00098	0.00041	0.00015	-	-	<0.00005
Phenanthrene		0.003	0.0004	FW			<0.00004	0.000071	0.00007	< 0.000050	0.000034	< 0.000050	0.000013	< 0.000050	0.000059	0.000096	0.000088	<0.00005	< 0.000050	-	-	0.000013
Pyrene	**0.1**	0.0002	0.000025	FW			<0.00002	<0.00001	<0.00001	< 0.000020	<0.00001	< 0.000020	<0.00001	< 0.000020	0.000017	< 0.000020	< 0.000020	<0.00002	< 0.000020	-	-	<0.00001
Quinoline	**0.00005**	0.034	0.0034	FW			<0.0001	*<0.00009*	*<0.00009*	*< 0.00024*	*<0.0001*	*< 0.00024*	<0.00005	*< 0.00024*	<0.00005	*< 0.00024*	*< 0.00024*	<0.00002	*< 0.00024*	-	-	<0.00005
2-methylnaphthalene	**0.015**		0.18				<0.00005	0.0023	0.0026	0.00033	0.0039	0.00026	<0.00005	< 0.00010	0.00075	0.0075	0.0067	0.0002	< 0.00010	-	-	<0.00005
1-Methylnaphthalene	**0.0055**		0.18				<0.00005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, Low Molecular Weight							-	0.0038	0.0041	0.0008	0.013	0.0012	<0.00005	< 0.00024	0.0013	0.0089	0.0079	0.00061	< 0.00024	-	-	<0.00005
PAH, High Molecular Weight							-	<0.00002	<0.00002	< 0.000050	<0.00002	< 0.000050	<0.00002	< 0.000050	0.000033	< 0.000050	< 0.000050	<0.00005	< 0.000050	-	-	<0.00002
Total PAH							-	0.0038	0.0041	0.0008	0.013	0.0012	<0.00005	< 0.00024	0.0013	0.0089	0.0079	0.00061	< 0.00024	-	-	<0.00005

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.

Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied

AO = Aesthetic Objective; OG = Operational Guideline
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
PAHs = polycyclic aromatic hydrocarbons
EPH (C10-C19) = extractable petroleum hydrocarbons, carbon range 10-19; LEPH = light extractable petroleum hydrocarbons
EPH (C19-C32) = extractable petroleum hydrocarbons, carbon range 19-32; HEPH = heavy extractable petroleum hydrocarbons
VH (C6-C10) = volatile hydrocarbons, carbon range 6-10; VPH = volatile petroleum hydrocarbons

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 19
Results of Groundwater Analyses - Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19-09MW-02	K19-09MW-02	K19-09MW-02	K19-09MW-03	K19-09MW-03	K19-09MW-04	K19-09MW-04	K19-09MW-05	K19-09MW-05	K19-09MW-06	K19-09MW-06	K19-09MW-07	K19-09MW-07	K19-09MW-07
Sample Control Number							-	K19B-09MW-02	MWF	-	K19B-09MW-03	-	K19B-09MW-04	-	K19B-09MW-05	-	K19B-09MW-06	-	K19B-09MW-07	K19B-09MW-07
Laboratory ID							101105151	B650178	B650178	101105151	B650178	101105151	B650178	101105151	B650178	101105151	B650178	101105151	B083804	B646703
Date Sampled							4-Nov-09	19-Jun-16	19-Jun-16	4-Nov-09	19-Jun-16	4-Nov-09	19-Jun-16	4-Nov-09	19-Jun-16	4-Nov-09	19-Jun-16	4-Nov-09	9-Sep-10	9-Jun-16
QA/QC								FDA	FD											
APEC/ AEC																				
Non-Halogenated Volatiles																				
Benzene	**0.005**	0.4	0.088	L	0.005		<0.0001	< 0.00040	< 0.00040	<0.0001	< 0.00040	<0.0001	< 0.00040	<0.0001	< 0.00040	<0.0001	< 0.00040	<0.0001	<0.0005	< 0.00040
Ethylbenzene	**0.14**	2	3.2	L	0.0016	AO	<0.0001	< 0.00040	< 0.00040	<0.0001	< 0.00040	<0.0001	< 0.00040	<0.0001	< 0.00040	<0.0001	< 0.00040	<0.0001	<0.0005	< 0.00040
Toluene	**0.06**	0.005	4.9	L	0.024	AO	<0.0001	< 0.00040	< 0.00040	<0.0001	< 0.00040	<0.0001	< 0.00040	<0.0001	< 0.00040	<0.0001	< 0.00040	<0.0001	<0.0005	< 0.00040
Xylenes	**0.09**	0.3	13	L	0.02	AO	<0.0001	< 0.00040	< 0.00040	0.0005	< 0.00040	<0.0001	< 0.00040	<0.0001	< 0.00040	<0.0001	< 0.00040	<0.0001	<0.001	< 0.00040
ortho-Xylene							-	< 0.00040	< 0.00040	-	< 0.00040	-	< 0.00040	-	< 0.00040	-	< 0.00040	-	<0.0005	< 0.00040
meta- & para-Xylene							-	< 0.00040	< 0.00040	-	< 0.00040	-	< 0.00040	-	< 0.00040	-	< 0.00040	-	<0.001	< 0.00040
Methyl t-butyl ether (MTBE)	**0.095**	34	6.1	I	0.015	AO	-	< 0.0040	< 0.0040	-	< 0.0040	-	< 0.0040	-	< 0.0040	-	< 0.0040	-	<0.004	< 0.0040
Styrene	**0.8**	0.72	0.072	FW			<0.0001	< 0.00050	< 0.00040	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	<0.0005	< 0.00040
Hydrocarbons																				
EPH (C10-C19)	**5**	5					<0.25	< 0.20	< 0.20	<0.25	< 0.20	<0.25	< 0.20	<0.25	< 0.20	<0.25	< 0.20	<0.25	<0.08	< 0.20
LEPH		0.5					<0.25	< 0.20	< 0.20	<0.25	< 0.20	<0.25	< 0.20	-	< 0.20	-	< 0.20	-	<0.08	< 0.20
EPH (C19-C32)							<0.25	< 0.20	< 0.20	<0.25	< 0.20	<0.25	< 0.20	<0.25	< 0.20	<0.25	< 0.20	<0.25	<0.08	< 0.20
HEPH							<0.25	< 0.20	< 0.20	<0.25	< 0.20	<0.25	< 0.20	-	< 0.20	-	< 0.20	-	<0.08	< 0.20
Volatile Hydrocarbons (VH6-10)	**15**	15					-	< 0.3	< 0.3	-	< 0.3	-	< 0.3	-	< 0.3	-	< 0.3	-	<0.3	< 0.3
VPH (C6-C10)		1.5					-	< 0.3	< 0.3	-	< 0.3	-	< 0.3	-	< 0.3	-	< 0.3	-	<0.3	0.51
F2			1.3																	
F3																				
F4																				
Polycyclic Aromatic Hydrocarbons																				
Acenaphthene	**0.25**	0.06	0.0058	FW			<0.0001	< 0.000050	< 0.000050	<0.0001	0.000062	<0.0001	< 0.000050	-	< 0.000050	-	< 0.000050	-	<0.00001	< 0.000050
Acenaphthylene			0.046	FW			<0.0001	< 0.000050	< 0.000050	<0.0001	< 0.000050	<0.0001	< 0.000050	-	< 0.000050	-	< 0.000050	-	<0.00001	< 0.000050
Acridine		0.0005	0.00005	FW			<0.00005	< 0.000050	< 0.000050	<0.00005	< 0.000050	<0.00005	< 0.000050	-	< 0.000050	-	< 0.000050	-	<0.00005	< 0.000050
Anthracene	**1**	0.001	0.000012	FW			<0.00001	< 0.000010	< 0.000010	<0.00001	< 0.000010	<0.00001	< 0.000010	-	< 0.000010	-	< 0.000010	-	<0.00001	< 0.000010
Benz(a)anthracene	**0.00007**	0.001	0.000018	FW			<0.00001	< 0.000010	< 0.000010	<0.00001	< 0.000010	<0.00001	< 0.000010	-	< 0.000010	-	< 0.000010	-	<0.00001	< 0.000010
Benzo(a)pyrene	**0.00001**	0.0001	0.000017	FW	0.00001		<0.00001	< 0.0000090	< 0.0000090	<0.00001	< 0.0000090	<0.00001	< 0.0000090	-	< 0.0000090	-	< 0.0000090	-	<0.00001	< 0.0000090
Benzo(b)fluoranthene							<0.00001	-	-	<0.00001	-	<0.00001	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene			0.00021	FW			<0.00001	< 0.000050	< 0.000050	<0.00001	< 0.000050	<0.00001	< 0.000050	-	< 0.000050	-	< 0.000050	-	<0.00002	< 0.000050
Benzo(j)fluoranthene																				
Benzo(k)fluoranthene			0.00048	FW			<0.00001	< 0.000050	< 0.000050	<0.00001	< 0.000050	<0.00001	< 0.000050	-	< 0.000050	-	< 0.000050	-	<0.00001	< 0.000050
Chrysene	**0.007**	0.001	0.0014	FW			<0.00001	< 0.000050	< 0.000050	<0.00001	< 0.000050	<0.00001	< 0.000050	-	< 0.000050	-	< 0.000050	-	<0.00001	< 0.000050
Dibenz(a,h)anthracene	**0.00001**		0.00028	FW			*<0.00001*	*< 0.000050*	*< 0.000050*	*<0.00001*	*< 0.000050*	*<0.00001*	*< 0.000050*	-	*< 0.000050*	-	*< 0.000050*	-	*<0.00002*	*< 0.000050*
Fluoranthene	**0.15**	0.002	0.00048	FW			<0.00004	< 0.000020	< 0.000020	<0.00004	< 0.000020	<0.00004	< 0.000020	-	< 0.000020	-	0.000034	-	<0.00001	< 0.000020
Benzo(b,j) fluoranthene	**0.00007**		0.00004	FW			-	*< 0.000050*	*< 0.000050*	-	*< 0.000050*	-	*< 0.000050*	-	*< 0.000050*	-	*< 0.000050*	-	<0.00001	*< 0.000050*
Fluorene	**0.15**	0.12	0.003	FW			<0.00005	< 0.000050	< 0.000050	0.00007	0.000058	<0.00005	< 0.000050	-	< 0.000050	-	< 0.000050	-	0.000011	< 0.000050
Indeno(1,2,3-c,d)pyrene			0.00023	FW			<0.00001	< 0.000050	< 0.000050	<0.00001	< 0.000050	<0.00001	< 0.000050	-	< 0.000050	-	< 0.000050	-	<0.00002	< 0.000050
Naphthalene	**0.08**	0.01	0.0011	FW			<0.0003	< 0.00010	< 0.00010	<0.0003	< 0.00010	<0.0003	< 0.00010	-	< 0.00010	-	< 0.00010	-	0.000063	< 0.00010
Phenanthrene		0.003	0.0004	FW			<0.00005	< 0.000050	< 0.000050	0.00008	0.00011	<0.00005	< 0.000050	-	< 0.000050	-	0.000075	-	0.000042	< 0.000050
Pyrene	**0.1**	0.0002	0.000025	FW			<0.00002	< 0.000020	< 0.000020	<0.00002	< 0.000020	<0.00002	< 0.000020	-	< 0.000020	-	0.000027	-	<0.00001	< 0.000020
Quinoline	**0.00005**	0.034	0.0034	FW			*<0.0005*	*< 0.00024*	*< 0.00024*	*<0.0005*	*< 0.00024*	*<0.0005*	*< 0.00024*	-	*< 0.00024*	-	*< 0.00024*	-	*<0.00005*	*< 0.00024*
2-methylnaphthalene	**0.015**		0.18				-	< 0.00010	< 0.00010	-	< 0.00010	-	< 0.00010	-	< 0.00010	-	< 0.00010	-	0.00008	< 0.00010
1-Methylnaphthalene	**0.0055**		0.18				-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, Low Molecular Weight							-	< 0.00024	< 0.00024	0.00015	< 0.00024	-	< 0.00024	-	< 0.00024	-	< 0.00024	-	0.0002	< 0.00024
PAH, High Molecular Weight							-	< 0.000050	< 0.000050	-	< 0.000050	-	< 0.000050	-	< 0.000050	-	0.000061	-	<0.00002	< 0.000050
Total PAH							-	< 0.00024	< 0.00024	0.00015	< 0.00024	-	< 0.00024	-	< 0.00024	-	< 0.00024	-	0.0002	< 0.00024

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.

Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied

AO = Aesthetic Objective; OG = Operational Guideline
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
PAHs = polycyclic aromatic hydrocarbons
EPH (C10-C19) = extractable petroleum hydrocarbons, carbon range 10-19; LEPH = light extractable petroleum hydrocarbons
EPH (C19-C32) = extractable petroleum hydrocarbons, carbon range 19-32; HEPH = heavy extractable petroleum hydrocarbons
VH (C6-C10) = volatile hydrocarbons, carbon range 6-10; VPH = volatile petroleum hydrocarbons

Table 19
Results of Groundwater Analyses - Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19B-10MW-12	K19B-10MW-12	K19B-10MW-13	K19B-10MW-13	K19B-10MW-14	K19B-10MW-14	K19B-10MW-14	K19B-10MW-15	K19B-10MW-15	K19B-10MW-15	K19B-10MW-16	K19B-10MW-16	K19B-10MW-18	K19B-10MW-18	K19-MW16-01D
Sample Control Number							K19B-10MW-12	K19B-10MW-12	K19B-10MW-13	K19B-10MW-13	DUP-01	K19B-10MW-14	K19B-10MW-14	K19B-10MW-15	K19B-10MW-15	MWC	03797-01	K19B-10MW-16	K19B-10MW-16	K19B-10MW-18	K19B-10MW-18	K19-MW16-01D
Laboratory ID							B083804	B650178	B083804	B650178	B083804	B083804	B650178	B083804	B646703	B646703	17N243826	B083804	B646703	B083804	B646703	B619935
Date Sampled							9-Sep-10	19-Jun-16	9-Sep-10	19-Jun-16	9-Sep-10	9-Sep-10	19-Jun-16	9-Sep-10	9-Jun-16	9-Jun-16	26-Jul-17	9-Sep-10	9-Jun-16	9-Sep-10	9-Jun-16	11-Mar-16
QA/QC											FD	FDA			FDA	FD						
APEC/ AEC														3a, 13, 15	3a, 13, 15	3a, 13, 15	3a, 13, 15					1c (d-g)
Non-Halogenated Volatiles																						
Benzene	**0.005**	0.4	0.088	L	0.005		<0.0004	< 0.00040	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	<0.0004	< 0.00040	< 0.00040	<0.0005	<0.0004	< 0.00040	<0.0004	< 0.00040	< 0.00040
Ethylbenzene	**0.14**	2	3.2	L	0.0016	AO	<0.0004	< 0.00040	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	<0.0004	< 0.00040	< 0.00040	<0.0005	<0.0004	< 0.00040	<0.0004	< 0.00040	< 0.00040
Toluene	**0.06**	0.005	4.9	L	0.024	AO	<0.0004	< 0.00040	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	<0.0004	< 0.00040	< 0.00040	<0.0005	<0.0004	< 0.00040	<0.0004	< 0.00040	< 0.00040
Xylenes	**0.09**	0.3	13	L	0.02	AO	<0.0004	< 0.00040	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	<0.0004	< 0.00040	< 0.00040	<0.001	<0.0004	< 0.00040	<0.0004	< 0.00040	< 0.00040
ortho-Xylene							<0.0004	< 0.00040	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	<0.0004	< 0.00040	< 0.00040	<0.0005	<0.0004	< 0.00040	<0.0004	< 0.00040	< 0.00040
meta- & para-Xylene							<0.0004	< 0.00040	<0.0004	< 0.00040	<0.0004	<0.0004	< 0.00040	<0.0004	< 0.00040	< 0.00040	<0.0005	<0.0004	< 0.00040	<0.0004	< 0.00040	< 0.00040
Methyl t-butyl ether (MTBE)	**0.095**	34	6.1	I	0.015	AO	<0.004	< 0.0040	<0.004	< 0.0040	<0.004	<0.004	< 0.0040	<0.004	< 0.0040	< 0.0040	<0.001	<0.004	< 0.0040	<0.004	< 0.0040	< 0.0040
Styrene	**0.8**	0.72	0.072	FW			<0.0004	< 0.00050	<0.0004	< 0.00050	<0.0004	<0.0004	< 0.00050	<0.0004	< 0.00050	< 0.00050	<0.0005	<0.0004	< 0.00040	<0.0004	< 0.00050	< 0.00050
Hydrocarbons																						
EPH (C10-C19)	**5**	5					<0.08	< 0.20	<0.08	< 0.20	<0.08	<0.08	< 0.20	<0.08	< 0.20	< 0.20	<0.1	<0.08	< 0.20	<0.08	< 0.20	< 0.20
LEPH		0.5					<0.08	< 0.20	<0.08	< 0.20	<0.08	<0.08	< 0.20	<0.08	< 0.20	< 0.20	<0.1	<0.08	< 0.20	<0.08	< 0.20	< 0.20
EPH (C19-C32)							<0.08	< 0.20	<0.08	< 0.20	<0.08	<0.08	< 0.20	<0.08	< 0.20	< 0.20	<0.1	<0.08	< 0.20	<0.08	< 0.20	< 0.20
HEPH							<0.08	< 0.20	<0.08	< 0.20	<0.08	<0.08	< 0.20	<0.08	< 0.20	< 0.20	<0.1	<0.08	< 0.20	<0.08	< 0.20	< 0.20
Volatile Hydrocarbons (VH6-10)	**15**	15					<0.3	< 0.3	<0.3	< 0.3	<0.3	<0.3	< 0.3	<0.3	< 0.3	< 0.3	<0.1	<0.3	< 0.3	<0.3	< 0.3	< 0.3
VPH (C6-C10)		1.5					<0.3	< 0.3	<0.3	< 0.3	<0.3	<0.3	< 0.3	<0.3	< 0.3	< 0.3	<0.1	<0.3	< 0.3	<0.3	< 0.3	< 0.3
F2			1.3														-					
F3																	-					
F4																	-					
Polycyclic Aromatic Hydrocarbons																						
Acenaphthene	**0.25**	0.06	0.0058	FW			<0.00001	< 0.000050	<0.00001	< 0.000050	<0.00001	<0.00001	< 0.000050	<0.00001	< 0.000050	< 0.000050	<0.00002	<0.00001	< 0.000050	<0.00001	< 0.000050	< 0.000050
Acenaphthylene			0.046	FW			<0.00001	< 0.000050	<0.00001	< 0.000050	<0.00001	<0.00001	< 0.000050	<0.00001	< 0.000050	< 0.000050	<0.00002	<0.00001	< 0.000050	<0.00001	< 0.000050	< 0.000050
Acridine		0.0005	0.00005	FW			<0.00005	< 0.000050	<0.00005	< 0.000050	<0.00005	<0.00005	< 0.000050	<0.00005	< 0.000050	< 0.000050	<0.00005	<0.00005	< 0.000050	<0.00005	< 0.000050	< 0.000050
Anthracene	**1**	0.001	0.000012	FW			<0.00001	< 0.000010	<0.00001	< 0.000010	<0.00001	<0.00001	< 0.000010	<0.00001	< 0.000010	< 0.000010	<0.00001	<0.00001	< 0.000010	<0.00001	< 0.000010	< 0.000010
Benz(a)anthracene	**0.00007**	0.001	0.000018	FW			<0.00001	< 0.000010	<0.00001	< 0.000010	<0.00001	<0.00001	< 0.000010	<0.00001	< 0.000010	< 0.000010	<0.00001	<0.00001	< 0.000010	<0.00001	< 0.000010	< 0.000010
Benzo(a)pyrene	**0.00001**	0.0001	0.000017	FW	0.00001		<0.00001	< 0.0000090	<0.00001	< 0.0000090	<0.00001	<0.00001	< 0.0000090	<0.00001	< 0.0000090	< 0.0000090	<0.00001	<0.00001	< 0.0000090	<0.00001	< 0.0000090	< 0.0000090
Benzo(b)fluoranthene							-	-	-	-	-	-	-	-	-	-	<0.00001	-	-	-	-	-
Benzo(g,h,i)perylene			0.00021	FW			<0.00002	< 0.000050	<0.00002	< 0.000050	<0.00002	<0.00002	< 0.000050	<0.00002	< 0.000050	< 0.000050	<0.00001	<0.00002	< 0.000050	<0.00002	< 0.000050	< 0.000050
Benzo(j)fluoranthene																	<0.00001					
Benzo(k)fluoranthene			0.00048	FW			<0.00001	< 0.000050	<0.00001	< 0.000050	<0.00001	<0.00001	< 0.000050	<0.00001	< 0.000050	< 0.000050	<0.00001	<0.00001	< 0.000050	<0.00001	< 0.000050	< 0.000050
Chrysene	**0.007**	0.001	0.0014	FW			<0.00001	< 0.000050	<0.00001	< 0.000050	<0.00001	<0.00001	< 0.000050	<0.00001	< 0.000050	< 0.000050	<0.00001	<0.00001	< 0.000050	<0.00001	< 0.000050	< 0.000050
Dibenz(a,h)anthracene	**0.00001**		0.00028	FW			*<0.00002*	*< 0.000050*	*<0.00002*	*< 0.000050*	*<0.00002*	*<0.00002*	*< 0.000050*	*<0.00002*	*< 0.000050*	*< 0.000050*	<0.00001	*<0.00002*	*< 0.000050*	*<0.00002*	*< 0.000050*	*< 0.000050*
Fluoranthene	**0.15**	0.002	0.00048	FW			<0.00001	< 0.000020	<0.00001	< 0.000020	0.000018	<0.00001	< 0.000020	0.000014	< 0.000020	< 0.000020	<0.00002	0.00002	< 0.000020	0.000015	< 0.000020	< 0.000020
Benzo(b,j) fluoranthene	**0.00007**		0.00004	FW			<0.00001	*< 0.000050*	<0.00001	*< 0.000050*	<0.00001	<0.00001	*< 0.000050*	<0.00001	*< 0.000050*	*< 0.000050*	<0.00001	<0.00001	*< 0.000050*	<0.00001	*< 0.000050*	*< 0.000050*
Fluorene	**0.15**	0.12	0.003	FW			0.000012	< 0.000050	<0.00001	< 0.000050	0.000033	<0.00001	< 0.000050	0.000017	< 0.000050	< 0.000050	<0.00002	0.000028	< 0.000050	0.000031	< 0.000050	< 0.000050
Indeno(1,2,3-c,d)pyrene			0.00023	FW			<0.00002	< 0.000050	<0.00002	< 0.000050	<0.00002	<0.00002	< 0.000050	<0.00002	< 0.000050	< 0.000050	<0.00001	<0.00002	< 0.000050	<0.00002	< 0.000050	< 0.000050
Naphthalene	**0.08**	0.01	0.0011	FW			0.000066	< 0.00010	<0.00005	< 0.00010	0.00013	<0.00005	< 0.00010	0.000056	< 0.00010	< 0.00010	<0.00005	0.000092	< 0.00010	0.00015	< 0.00010	< 0.00010
Phenanthrene		0.003	0.0004	FW			0.000033	< 0.000050	<0.00001	< 0.000050	0.00015	0.000011	< 0.000050	0.000097	< 0.000050	< 0.000050	<0.00004	0.00015	< 0.000050	0.00014	< 0.000050	< 0.000050
Pyrene	**0.1**	0.0002	0.000025	FW			<0.00001	< 0.000020	<0.00001	< 0.000020	0.000032	<0.00001	< 0.000020	0.000023	< 0.000020	< 0.000020	<0.00002	0.000034	< 0.000020	0.000027	< 0.000020	< 0.000020
Quinoline	**0.00005**	0.034	0.0034	FW			<0.00005	*< 0.00024*	<0.00005	*< 0.00024*	<0.00005	<0.00005	*< 0.00024*	<0.00005	*< 0.00024*	*< 0.00024*	*<0.0001*	<0.00005	*< 0.00024*	<0.00005	*< 0.00024*	*< 0.00024*
2-methylnaphthalene	**0.015**		0.18				0.00009	< 0.00010	<0.00005	< 0.00010	0.00026	<0.00005	< 0.00010	0.00014	< 0.00010	< 0.00010	<0.00005	0.00026	< 0.00010	0.00027	< 0.00010	< 0.00010
1-Methylnaphthalene	**0.0055**		0.18				-	-	-	-	-	-	-	-	-	-	<0.00005	-	-	-	-	-
PAH, Low Molecular Weight							0.0002	< 0.00024	<0.00005	< 0.00024	0.00057	<0.00005	< 0.00024	0.00031	< 0.00024	< 0.00024	-	0.00053	< 0.00024	0.00058	< 0.00024	< 0.00024
PAH, High Molecular Weight							<0.00002	< 0.000050	<0.00002	< 0.000050	0.00005	<0.00002	< 0.000050	0.000037	< 0.000050	< 0.000050	-	0.000054	< 0.000050	0.000042	< 0.000050	< 0.000050
Total PAH							0.0002	< 0.00024	<0.00005	< 0.00024	0.00062	<0.00005	< 0.00024	0.00035	< 0.00024	< 0.00024	-	0.00059	< 0.00024	0.00062	< 0.00024	< 0.00024

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.

Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied

AO = Aesthetic Objective; OG = Operational Guideline
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
PAHs = polycyclic aromatic hydrocarbons
EPH (C10-C19) = extractable petroleum hydrocarbons, carbon range 10-19; LEPH = light extractable petroleum hydrocarbons
EPH (C19-C32) = extractable petroleum hydrocarbons, carbon range 19-32; HEPH = heavy extractable petroleum hydrocarbons
VH (C6-C10) = volatile hydrocarbons, carbon range 6-10; VPH = volatile petroleum hydrocarbons

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 19
Results of Groundwater Analyses - Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19-MW16-01D	K19-MW16-01D	K19-MW16-01D	K19-MW16-03S	K19-MW16-03D	K19-MW16-03D	K19-MW16-03D	K19-MW16-03D	K19-MW16-04	K19-MW16-04	K19-MW16-05	K19-MW16-05	K19-MW16-06	K19-MW16-06	K19-MW16-07S	K19-MW16-07S
Sample Control Number							K19-MW16-01D	06690-06	3809-03	K19-MW16-03S	K19-MW16-03D	K19-MW16-03D	03375-03	3808-05	K19-MW16-04	K19-MW16-04	K19-MW16-05	03816-02	K19-MW16-06	K19-MW16-06	K19-MW16-07S	03797-07
Laboratory ID							B650178	B710365	17N238668	B650178	B620736	B650178	B709734	17N238668	B620736	B650178	B650178	17N242036	B620736	B648291	B650178	17N243826
Date Sampled							17-Jun-16	8-Feb-17	15-Jul-17	17-Jun-16	15-Mar-16	17-Jun-16	4-Feb-17	14-Jul-17	15-Mar-16	16-Jun-16	18-Jun-16	21-Jul-17	14-Mar-16	10-Jun-16	19-Jun-16	26-Jul-17
QA/QC																						
APEC/ AEC							1c (d-g)	1c (d-g)	1c (d-g)	1b	1b	1b	1b	1b			1c	1c				backgrnd
Non-Halogenated Volatiles																						
Benzene	**0.005**	0.4	0.088	L	0.005		< 0.00040	<0.0004	0.0005	< 0.00040	< 0.00040	< 0.00040	<0.0004	<0.0005	**0.0083**	**0.0097**	< 0.00040	<0.0005	< 0.00040	0.00046	< 0.00040	<0.0005
Ethylbenzene	**0.14**	2	3.2	L	0.0016	AO	< 0.00040	<0.0004	<0.0005	< 0.00040	< 0.00040	< 0.00040	<0.0004	<0.0005	0.0052	0.0024	< 0.00040	<0.0005	< 0.00040	< 0.00040	< 0.00040	<0.0005
Toluene	**0.06**	0.005	4.9	L	0.024	AO	< 0.00040	<0.0004	<0.0005	< 0.00040	0.0021	< 0.00040	<0.0004	<0.0005	0.0028	0.0019	< 0.00040	<0.0005	< 0.00040	< 0.00040	< 0.00040	<0.0005
Xylenes	**0.09**	0.3	13	L	0.02	AO	< 0.00040	<0.0004	<0.001	< 0.00040	< 0.00040	< 0.00040	<0.0004	<0.001	0.034	0.015	< 0.00040	<0.001	< 0.00040	< 0.00040	< 0.00040	<0.001
ortho-Xylene							< 0.00040	<0.0004	<0.0005	< 0.00040	< 0.00040	< 0.00040	<0.0004	<0.0005	0.007	0.0041	< 0.00040	<0.0005	< 0.00040	< 0.00040	< 0.00040	<0.0005
meta- & para-Xylene							< 0.00040	<0.0004	<0.0005	< 0.00040	< 0.00040	< 0.00040	<0.0004	<0.0005	0.027	0.011	< 0.00040	<0.0005	< 0.00040	< 0.00040	< 0.00040	<0.0005
Methyl t-butyl ether (MTBE)	**0.095**	34	6.1	I	0.015	AO	< 0.0040	<0.004	<0.001	< 0.0040	< 0.0040	< 0.0040	<0.004	<0.001	< 0.0040	< 0.0040	< 0.0040	<0.001	< 0.0040	< 0.0040	< 0.0040	<0.001
Styrene	**0.8**	0.72	0.072	FW			< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00040	< 0.00050	<0.0005
Hydrocarbons																						
EPH (C10-C19)	**5**	5					< 0.20	<0.2	<0.1	< 0.20	< 0.20	< 0.20	<0.2	<0.1	0.66	0.58	< 0.20	-	< 0.20	< 0.20	< 0.20	<0.1
LEPH		0.5					< 0.20	<0.2	<0.1	< 0.20	< 0.20	< 0.20	<0.2	<0.1	0.64	0.57	< 0.20	-	< 0.20	< 0.20	< 0.20	<0.1
EPH (C19-C32)							< 0.20	<0.2	<0.1	< 0.20	< 0.20	< 0.20	<0.2	<0.1	< 0.20	< 0.20	< 0.20	-	< 0.20	< 0.20	< 0.20	<0.1
HEPH							< 0.20	<0.2	<0.1	< 0.20	< 0.20	< 0.20	<0.2	<0.1	< 0.20	< 0.20	< 0.20	-	< 0.20	< 0.20	< 0.20	<0.1
Volatile Hydrocarbons (VH6-10)	**15**	15					< 0.3	<0.3	<0.1	< 0.3	< 0.3	< 0.3	<0.3	<0.1	< 0.3	< 0.3	< 0.3	<0.1	< 0.3	< 0.3	< 0.3	<0.1
VPH (C6-C10)		1.5					< 0.3	<0.3	<0.1	< 0.3	< 0.3	< 0.3	<0.3	<0.1	< 0.3	< 0.3	< 0.3	<0.1	< 0.3	< 0.3	< 0.3	<0.1
F2			1.3						-					-				<0.1				-
F3									-					-				<0.1				-
F4									-					-				<0.1				-
Polycyclic Aromatic Hydrocarbons																						
Acenaphthene	**0.25**	0.06	0.0058	FW			< 0.000050	<0.00005	<0.00002	< 0.000050	< 0.000050	< 0.000050	<0.00005	<0.00002	0.000092	0.00007	< 0.000050	<0.00002	< 0.000050	< 0.000050	< 0.000050	<0.00002
Acenaphthylene			0.046	FW			< 0.000050	<0.00005	<0.00002	< 0.000050	< 0.000050	< 0.000050	<0.00005	<0.00002	< 0.000050	< 0.000050	< 0.000050	<0.00002	< 0.000050	< 0.000050	< 0.000050	<0.00002
Acridine		0.0005	0.00005	FW			< 0.000050	<0.00005	<0.00005	< 0.000050	< 0.000050	< 0.000050	<0.00005	<0.00005	< 0.000050	< 0.000050	< 0.000050	<0.00005	< 0.000050	< 0.000050	< 0.000050	<0.00005
Anthracene	**1**	0.001	0.000012	FW			< 0.000010	<0.00001	<0.00001	< 0.000010	< 0.000010	< 0.000010	<0.00001	<0.00001	< 0.000010	< 0.000010	< 0.000010	<0.00001	< 0.000010	< 0.000010	< 0.000010	<0.00001
Benz(a)anthracene	**0.00007**	0.001	0.000018	FW			< 0.000010	<0.00001	<0.00001	< 0.000010	< 0.000010	< 0.000010	<0.00001	<0.00001	< 0.000010	< 0.000010	< 0.000010	<0.00001	< 0.000010	< 0.000010	< 0.000010	<0.00001
Benzo(a)pyrene	**0.00001**	0.0001	0.000017	FW	0.00001		< 0.0000090	<0.000005	<0.00001	< 0.0000090	< 0.0000090	< 0.0000090	<0.000009	<0.00001	< 0.0000090	< 0.0000090	< 0.0000090	<0.00001	< 0.0000090	< 0.0000090	< 0.0000090	<0.00001
Benzo(b)fluoranthene							-	-	<0.00001	-	-	-	-	<0.00001	-	-	-	<0.00001	-	-	-	<0.00001
Benzo(g,h,i)perylene			0.00021	FW			< 0.000050	<0.00005	<0.00001	< 0.000050	< 0.000050	< 0.000050	<0.00005	<0.00001	< 0.000050	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	< 0.000050	<0.00001
Benzo(j)fluoranthene									<0.00001					<0.00001				<0.00001				<0.00001
Benzo(k)fluoranthene			0.00048	FW			< 0.000050	<0.00005	<0.00001	< 0.000050	< 0.000050	< 0.000050	<0.00005	<0.00001	< 0.000050	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	< 0.000050	<0.00001
Chrysene	**0.007**	0.001	0.0014	FW			< 0.000050	<0.00005	<0.00001	< 0.000050	< 0.000050	< 0.000050	<0.00005	<0.00001	< 0.000050	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	< 0.000050	<0.00001
Dibenz(a,h)anthracene	**0.00001**		0.00028	FW			*< 0.000050*	<0.000003	<0.00001	*< 0.000050*	*< 0.000050*	*< 0.000050*	<0.000006	<0.00001	*< 0.000050*	*< 0.000050*	*< 0.000050*	<0.00001	*< 0.000050*	*< 0.000050*	*< 0.000050*	<0.00001
Fluoranthene	**0.15**	0.002	0.00048	FW			< 0.000020	<0.00002	<0.00002	< 0.000020	< 0.000020	< 0.000020	<0.00002	<0.00002	< 0.000020	< 0.000020	< 0.000020	<0.00002	< 0.000020	< 0.000020	< 0.000020	<0.00002
Benzo(b,j) fluoranthene	**0.00007**		0.00004	FW			*< 0.000050*	<0.00003	<0.00001	*< 0.000050*	*< 0.000050*	*< 0.000050*	*<0.00005*	<0.00001	*< 0.000050*	*< 0.000050*	*< 0.000050*	<0.00001	*< 0.000050*	*< 0.000050*	*< 0.000050*	<0.00001
Fluorene	**0.15**	0.12	0.003	FW			< 0.000050	<0.00005	<0.00002	< 0.000050	< 0.000050	< 0.000050	<0.00005	<0.00002	0.00034	0.00041	< 0.000050	<0.00002	< 0.000050	< 0.000050	< 0.000050	<0.00002
Indeno(1,2,3-c,d)pyrene			0.00023	FW			< 0.000050	<0.00005	<0.00001	< 0.000050	< 0.000050	< 0.000050	<0.00005	<0.00001	< 0.000050	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	< 0.000050	<0.00001
Naphthalene	**0.08**	0.01	0.0011	FW			< 0.00010	<0.0001	<0.00005	< 0.00010	< 0.00010	< 0.00010	<0.0001	<0.00005	0.016	0.0073	< 0.00010	<0.00005	< 0.00010	< 0.00010	< 0.00010	<0.00005
Phenanthrene		0.003	0.0004	FW			< 0.000050	<0.00005	<0.00004	< 0.000050	< 0.000050	< 0.000050	<0.00005	<0.00004	0.00014	0.00015	< 0.000050	<0.00004	< 0.000050	< 0.000050	< 0.000050	<0.00004
Pyrene	**0.1**	0.0002	0.000025	FW			< 0.000020	<0.00002	<0.00002	< 0.000020	< 0.000020	< 0.000020	<0.00002	<0.00002	< 0.000020	< 0.000020	< 0.000020	<0.00002	< 0.000020	< 0.000020	< 0.000020	<0.00002
Quinoline	**0.00005**	0.034	0.0034	FW			*< 0.00024*	<0.00002	*<0.0001*	*< 0.00024*	*< 0.00024*	*< 0.00024*	<0.00004	*<0.0001*	*< 0.00057*	0.00036	*< 0.00024*	*<0.0001*	*< 0.00024*	*< 0.00024*	*< 0.00024*	*<0.0001*
2-methylnaphthalene	**0.015**		0.18				< 0.00010	<0.0001	<0.00005	< 0.00010	< 0.00010	< 0.00010	<0.0001	<0.00005	**0.022**	**0.018**	< 0.00010	<0.00005	< 0.00010	< 0.00010	< 0.00010	<0.00005
1-Methylnaphthalene	**0.0055**		0.18				-	-	<0.00005	-	-	-	-	<0.00005	**-**	**-**	-	<0.00005	-	-	-	<0.00005
PAH, Low Molecular Weight							< 0.00024	<0.0001	-	< 0.00024	< 0.00024	< 0.00024	<0.0001	-	0.038	0.026	< 0.00024	-	< 0.00024	< 0.00024	< 0.00024	-
PAH, High Molecular Weight							< 0.000050	<0.00005	-	< 0.000050	< 0.000050	< 0.000050	<0.00005	-	< 0.000050	< 0.000050	< 0.000050	-	< 0.000050	< 0.000050	< 0.000050	-
Total PAH							< 0.00024	<0.0001	-	< 0.00024	< 0.00024	< 0.00024	<0.0001	-	0.038	0.026	< 0.00024	-	< 0.00024	< 0.00024	< 0.00024	-

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.

Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied

AO = Aesthetic Objective; OG = Operational Guideline
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
PAHs = polycyclic aromatic hydrocarbons
EPH (C10-C19) = extractable petroleum hydrocarbons, carbon range 10-19; LEPH = light extractable petroleum hydrocarbons
EPH (C19-C32) = extractable petroleum hydrocarbons, carbon range 19-32; HEPH = heavy extractable petroleum hydrocarbons
VH (C6-C10) = volatile hydrocarbons, carbon range 6-10; VPH = volatile petroleum hydrocarbons

Table 19
Results of Groundwater Analyses - Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19-MW16-07D	K19-MW16-07D	K19-MW16-07D	K19-MW16-07D	K19-MW16-08	K19-MW16-08	K19-MW16-08	K19-MW16-08	K19-MW16-09	K19-MW16-09	K19-MW16-10S	K19-MW16-10S	K19-MW16-10S	K19-MW16-10D	K19-MW16-10D	K19-MW16-10D
Sample Control Number							K19-MW16-07D	K19-MW16-07D	03815-03	03815-04	K19-MW16-08	K19-MW16-08-DUP	K19-MW16-08	MWD	K19-MW16-09	06689-01	K19-MW16-10S	K19-MW16-10S	3808-02	K19-MW16-10D	K19-MW16-10D	3808-01
Laboratory ID							B620736	B650178	17N242036	17N242036	B620736	B620736	B650178	B650178	B650178	B709775	B621590	B650178	17N238668	B620736	B650178	17N238668
Date Sampled							14-Mar-16	18-Jun-16	20-Jul-17	20-Jul-17	15-Mar-16	15-Mar-16	16-Jun-16	16-Jun-16	18-Jun-16	5-Feb-17	18-Mar-16	17-Jun-16	13-Jul-17	15-Mar-16	17-Jun-16	13-Jul-17
QA/QC									FDA	FD	FDA	FD	FDA	FD								
APEC/ AEC							backgrnd	backgrnd	backgrnd	backgrnd							2b (d-g)	2b (d-g)	2b (d-g)	2b (d-g)	2b (d-g)	2b (d-g)
Non-Halogenated Volatiles																						
Benzene	**0.005**	0.4	0.088	L	0.005		< 0.00040	< 0.00040	<0.0005	<0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.0004	< 0.00040	< 0.00040	<0.0005	< 0.00040	< 0.00040	<0.0005
Ethylbenzene	**0.14**	2	3.2	L	0.0016	AO	< 0.00040	< 0.00040	<0.0005	<0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.0004	< 0.00040	< 0.00040	<0.0005	< 0.00040	< 0.00040	<0.0005
Toluene	**0.06**	0.005	4.9	L	0.024	AO	< 0.00040	< 0.00040	<0.0005	<0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.0004	< 0.00040	< 0.00040	<0.0005	< 0.00040	< 0.00040	<0.0005
Xylenes	**0.09**	0.3	13	L	0.02	AO	< 0.00040	< 0.00040	<0.001	<0.001	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.0004	< 0.00040	< 0.00040	<0.001	< 0.00040	< 0.00040	<0.001
ortho-Xylene							< 0.00040	< 0.00040	<0.0005	<0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.0004	< 0.00040	< 0.00040	<0.0005	< 0.00040	< 0.00040	<0.0005
meta- & para-Xylene							< 0.00040	< 0.00040	<0.0005	<0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.0004	< 0.00040	< 0.00040	<0.0005	< 0.00040	< 0.00040	<0.0005
Methyl t-butyl ether (MTBE)	**0.095**	34	6.1	I	0.015	AO	< 0.0040	< 0.0040	<0.001	<0.001	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	<0.004	< 0.0040	< 0.0040	<0.001	< 0.0040	< 0.0040	<0.001
Styrene	**0.8**	0.72	0.072	FW			< 0.00050	< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005
Hydrocarbons																						
EPH (C10-C19)	**5**	5					< 0.20	< 0.20	<0.1	<0.1	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	<0.2	< 0.20	< 0.20	<0.1	< 0.20	< 0.20	<0.1
LEPH		0.5					< 0.20	< 0.20	<0.1	<0.1	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	<0.2	< 0.20	< 0.20	<0.1	< 0.20	< 0.20	<0.1
EPH (C19-C32)							< 0.20	< 0.20	<0.1	<0.1	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	<0.2	< 0.20	< 0.20	<0.1	< 0.20	< 0.20	<0.1
HEPH							< 0.20	< 0.20	<0.1	<0.1	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	<0.2	< 0.20	< 0.20	<0.1	< 0.20	< 0.20	<0.1
Volatile Hydrocarbons (VH6-10)	**15**	15					< 0.3	< 0.3	<0.1	<0.1	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	<0.3	< 0.3	< 0.3	<0.1	< 0.3	< 0.3	<0.1
VPH (C6-C10)		1.5					< 0.3	< 0.3	<0.1	<0.1	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	<0.3	< 0.3	< 0.3	<0.1	< 0.3	< 0.3	<0.1
F2			1.3						-	-									-			-
F3									-	-									-			-
F4									-	-									-			-
Polycyclic Aromatic Hydrocarbons																						
Acenaphthene	**0.25**	0.06	0.0058	FW			< 0.000050	< 0.000050	<0.00002	<0.00002	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00005	< 0.000050	< 0.000050	<0.00002	< 0.000050	< 0.000050	<0.00002
Acenaphthylene			0.046	FW			< 0.000050	< 0.000050	<0.00002	<0.00002	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00005	< 0.000050	< 0.000050	<0.00002	< 0.000050	< 0.000050	<0.00002
Acridine		0.0005	0.00005	FW			< 0.000050	< 0.000050	<0.00005	<0.00005	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00005	< 0.000050	< 0.000050	<0.00005	< 0.000050	< 0.000050	<0.00005
Anthracene	**1**	0.001	0.000012	FW			< 0.000010	< 0.000010	<0.00001	<0.00001	< 0.000010	< 0.000010	< 0.000010	< 0.000010	< 0.000010	<0.00001	< 0.000010	< 0.000010	<0.00001	< 0.000010	< 0.000010	<0.00001
Benz(a)anthracene	**0.00007**	0.001	0.000018	FW			< 0.000010	< 0.000010	<0.00001	<0.00001	< 0.000010	< 0.000010	< 0.000010	< 0.000010	< 0.000010	<0.00001	< 0.000010	< 0.000010	<0.00001	< 0.000010	< 0.000010	<0.00001
Benzo(a)pyrene	**0.00001**	0.0001	0.000017	FW	0.00001		< 0.0000090	< 0.0000090	<0.00001	<0.00001	< 0.0000090	< 0.0000090	< 0.0000090	< 0.0000090	< 0.0000090	<0.000009	< 0.0000090	< 0.0000090	<0.00001	< 0.0000090	< 0.0000090	<0.00001
Benzo(b)fluoranthene							-	-	<0.00001	<0.00001	-	-	-	-	-	-	-	-	<0.00001	-	-	<0.00001
Benzo(g,h,i)perylene			0.00021	FW			< 0.000050	< 0.000050	<0.00001	<0.00001	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00005	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	<0.00001
Benzo(j)fluoranthene									<0.00001	<0.00001									<0.00001			<0.00001
Benzo(k)fluoranthene			0.00048	FW			< 0.000050	< 0.000050	<0.00001	<0.00001	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00005	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	<0.00001
Chrysene	**0.007**	0.001	0.0014	FW			< 0.000050	< 0.000050	<0.00001	<0.00001	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00005	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	<0.00001
Dibenz(a,h)anthracene	**0.00001**		0.00028	FW			*< 0.000050*	*< 0.000050*	<0.00001	<0.00001	*< 0.000050*	*< 0.000050*	*< 0.000050*	*< 0.000050*	*< 0.000050*	<0.000006	*< 0.000050*	*< 0.000050*	<0.00001	*< 0.000050*	*< 0.000050*	<0.00001
Fluoranthene	**0.15**	0.002	0.00048	FW			< 0.000020	< 0.000020	<0.00002	<0.00002	< 0.000020	< 0.000020	< 0.000020	< 0.000020	< 0.000020	<0.00002	< 0.000020	< 0.000020	<0.00002	< 0.000020	< 0.000020	<0.00002
Benzo(b,j) fluoranthene	**0.00007**		0.00004	FW			*< 0.000050*	*< 0.000050*	<0.00001	<0.00001	*< 0.000050*	*< 0.000050*	*< 0.000050*	*< 0.000050*	*< 0.000050*	*<0.00005*	*< 0.000050*	*< 0.000050*	<0.00001	*< 0.000050*	*< 0.000050*	<0.00001
Fluorene	**0.15**	0.12	0.003	FW			< 0.000050	< 0.000050	<0.00002	<0.00002	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00005	< 0.000050	< 0.000050	<0.00002	< 0.000050	< 0.000050	<0.00002
Indeno(1,2,3-c,d)pyrene			0.00023	FW			< 0.000050	< 0.000050	<0.00001	<0.00001	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00005	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	<0.00001
Naphthalene	**0.08**	0.01	0.0011	FW			< 0.00010	< 0.00010	<0.00005	<0.00005	< 0.00010	< 0.00010	< 0.00010	< 0.00010	0.00016	0.00012	< 0.00010	< 0.00010	<0.00005	< 0.00010	< 0.00010	<0.00005
Phenanthrene		0.003	0.0004	FW			< 0.000050	< 0.000050	<0.00004	<0.00004	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00005	< 0.000050	< 0.000050	<0.00004	< 0.000050	< 0.000050	<0.00004
Pyrene	**0.1**	0.0002	0.000025	FW			< 0.000020	< 0.000020	<0.00002	<0.00002	< 0.000020	< 0.000020	< 0.000020	< 0.000020	< 0.000020	<0.00002	< 0.000020	< 0.000020	<0.00002	< 0.000020	< 0.000020	<0.00002
Quinoline	**0.00005**	0.034	0.0034	FW			*< 0.00024*	*< 0.00024*	*<0.0001*	*<0.0001*	*< 0.00024*	*< 0.00024*	*< 0.00024*	*< 0.00024*	*< 0.00024*	<0.00004	*< 0.00024*	*< 0.00024*	*<0.0001*	*< 0.00024*	*< 0.00024*	*<0.0001*
2-methylnaphthalene	**0.015**		0.18				< 0.00010	< 0.00010	<0.00005	<0.00005	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	<0.0001	< 0.00010	< 0.00010	<0.00005	< 0.00010	< 0.00010	<0.00005
1-Methylnaphthalene	**0.0055**		0.18				-	-	<0.00005	<0.00005	-	-	-	-	-	-	-	-	<0.00005	-	-	<0.00005
PAH, Low Molecular Weight							< 0.00024	< 0.00024	-	-	< 0.00024	< 0.00024	< 0.00024	< 0.00024	< 0.00024	0.00012	< 0.00024	< 0.00024	-	< 0.00024	< 0.00024	-
PAH, High Molecular Weight							< 0.000050	< 0.000050	-	-	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00005	< 0.000050	< 0.000050	-	< 0.000050	< 0.000050	-
Total PAH							< 0.00024	< 0.00024	-	-	< 0.00024	< 0.00024	< 0.00024	< 0.00024	< 0.00024	0.00012	< 0.00024	< 0.00024	-	< 0.00024	< 0.00024	-

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.

Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied

AO = Aesthetic Objective; OG = Operational Guideline
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
PAHs = polycyclic aromatic hydrocarbons
EPH (C10-C19) = extractable petroleum hydrocarbons, carbon range 10-19; LEPH = light extractable petroleum hydrocarbons
EPH (C19-C32) = extractable petroleum hydrocarbons, carbon range 19-32; HEPH = heavy extractable petroleum hydrocarbons
VH (C6-C10) = volatile hydrocarbons, carbon range 6-10; VPH = volatile petroleum hydrocarbons

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 19
Results of Groundwater Analyses - Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19-MW16-11	K19-MW16-11	K19-MW16-12S	K19-MW16-12S	K19-MW16-12S	K19-MW16-12D	K19-MW16-12D	K19-MW16-12D	K19-MW16-13	K19-MW16-13	K19-MW16-13	K19-MW16-14	K19-MW16-14	K19-MW16-14	K19-MW16-14	K19-MW16-15	K19-MW16-15
Sample Control Number							K19-MW16-11	K19-MW16-11	K19-MW16-12S	K19-MW16-12S	3808-04	K19-MW16-12D	K19-MW16-12D	3808-03	K19-MW16-13	K19-MW16-13-DUP	K19-MW16-13	K19-MW16-14	K19-MW16-14	06690-07	3809-01	K19-MW16-15	K19-MW16-15
Laboratory ID							B621590	B650178	B621590	B650178	17N238668	B621590	B650178	17N238668	B621590	B621590	B646703	B621590	B650178	B710365	17N238668	B621590	B648667
Date Sampled							16-Mar-16	19-Jun-16	18-Mar-16	17-Jun-16	13-Jul-17	16-Mar-16	17-Jun-16	13-Jul-17	17-Mar-16	17-Mar-16	8-Jun-16	17-Mar-16	16-Jun-16	9-Feb-17	15-Jul-17	17-Mar-16	13-Jun-16
QA/QC															FDA	FD							
APEC/ AEC									K19B (d-g)	K19B (d-g)	K19B (d-g)	K19B (d-g)	K19B (d-g)	K19B (d-g)				1b	1b	1b	1b		
Non-Halogenated Volatiles																							
Benzene	**0.005**	0.4	0.088	L	0.005		< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.0005	< 0.00040	< 0.00040	<0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.0004	<0.0005	< 0.00040	< 0.00040
Ethylbenzene	**0.14**	2	3.2	L	0.0016	AO	< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.0005	< 0.00040	< 0.00040	<0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.0004	<0.0005	< 0.00040	< 0.00040
Toluene	**0.06**	0.005	4.9	L	0.024	AO	< 0.00040	< 0.00040	0.00084	< 0.00040	<0.0005	< 0.00040	< 0.00040	<0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.0004	<0.0005	< 0.00040	< 0.00040
Xylenes	**0.09**	0.3	13	L	0.02	AO	< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.001	< 0.00040	< 0.00040	<0.001	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.0004	<0.001	< 0.00040	< 0.00040
ortho-Xylene							< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.0005	< 0.00040	< 0.00040	<0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.0004	<0.0005	< 0.00040	< 0.00040
meta- & para-Xylene							< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.0005	< 0.00040	< 0.00040	<0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.0004	<0.0005	< 0.00040	< 0.00040
Methyl t-butyl ether (MTBE)	**0.095**	34	6.1	I	0.015	AO	< 0.0040	< 0.0040	< 0.0040	< 0.0040	<0.001	< 0.0040	< 0.0040	<0.001	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	<0.004	<0.001	< 0.0040	< 0.0040
Styrene	**0.8**	0.72	0.072	FW			< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00040	< 0.00050	< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050
Hydrocarbons																							
EPH (C10-C19)	**5**	5					< 0.20	< 0.20	< 0.20	< 0.20	<0.1	< 0.20	< 0.20	<0.1	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	<0.2	<0.1	< 0.20	< 0.20
LEPH		0.5					< 0.20	< 0.20	< 0.20	< 0.20	<0.1	< 0.20	< 0.20	<0.1	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	<0.2	<0.1	< 0.20	< 0.20
EPH (C19-C32)							< 0.20	< 0.20	< 0.20	< 0.20	<0.1	< 0.20	< 0.20	<0.1	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	<0.2	<0.1	< 0.20	< 0.20
HEPH							< 0.20	< 0.20	< 0.20	< 0.20	<0.1	< 0.20	< 0.20	<0.1	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	<0.2	<0.1	< 0.20	< 0.20
Volatile Hydrocarbons (VH6-10)	**15**	15					< 0.3	< 0.3	< 0.3	< 0.3	<0.1	< 0.3	< 0.3	<0.1	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	<0.3	<0.1	< 0.3	< 0.3
VPH (C6-C10)		1.5					< 0.3	< 0.3	< 0.3	< 0.3	<0.1	< 0.3	< 0.3	<0.1	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	<0.3	<0.1	< 0.3	< 0.3
F2			1.3								-			-							-		
F3											-			-							-		
F4											-			-							-		
Polycyclic Aromatic Hydrocarbons																							
Acenaphthene	**0.25**	0.06	0.0058	FW			< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00002	< 0.000050	< 0.000050	<0.00002	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00005	<0.00002	< 0.000050	< 0.000050
Acenaphthylene			0.046	FW			< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00002	< 0.000050	< 0.000050	<0.00002	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00005	<0.00002	< 0.000050	< 0.000050
Acridine		0.0005	0.00005	FW			< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00005	< 0.000050	< 0.000050	<0.00005	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00005	<0.00005	< 0.000050	< 0.000050
Anthracene	**1**	0.001	0.000012	FW			< 0.000010	< 0.000010	< 0.000010	< 0.000010	<0.00001	< 0.000010	< 0.000010	<0.00001	< 0.000010	< 0.000010	< 0.000010	< 0.000010	< 0.000010	<0.00001	<0.00001	< 0.000010	< 0.000010
Benz(a)anthracene	**0.00007**	0.001	0.000018	FW			< 0.000010	< 0.000010	< 0.000010	< 0.000010	<0.00001	< 0.000010	< 0.000010	<0.00001	< 0.000010	< 0.000010	< 0.000010	< 0.000010	< 0.000010	<0.00001	<0.00001	< 0.000010	< 0.000010
Benzo(a)pyrene	**0.00001**	0.0001	0.000017	FW	0.00001		< 0.0000090	< 0.0000090	< 0.0000090	< 0.0000090	<0.00001	< 0.0000090	< 0.0000090	<0.00001	< 0.0000090	< 0.0000090	< 0.0000090	< 0.0000090	< 0.0000090	<0.000005	<0.00001	< 0.0000090	< 0.0000090
Benzo(b)fluoranthene			-				-	-	-	-	<0.00001	-	-	<0.00001	-	-	-	-	-	-	<0.00001	-	-
Benzo(g,h,i)perylene			0.00021	FW			< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00005	<0.00001	< 0.000050	< 0.000050
Benzo(j)fluoranthene											<0.00001			<0.00001							<0.00001		
Benzo(k)fluoranthene			0.00048	FW			< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00005	<0.00001	< 0.000050	< 0.000050
Chrysene	**0.007**	0.001	0.0014	FW			< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00005	<0.00001	< 0.000050	< 0.000050
Dibenz(a,h)anthracene	**0.00001**		0.00028	FW			*< 0.000050*	*< 0.000050*	*< 0.000050*	*< 0.000050*	<0.00001	*< 0.000050*	*< 0.000050*	<0.00001	*< 0.000050*	*< 0.000050*	*< 0.000050*	*< 0.000050*	*< 0.000050*	<0.000003	<0.00001	*< 0.000050*	*< 0.000050*
Fluoranthene	**0.15**	0.002	0.00048	FW			< 0.000020	< 0.000020	< 0.000020	< 0.000020	<0.00002	< 0.000020	< 0.000020	<0.00002	< 0.000020	< 0.000020	< 0.000020	< 0.000020	< 0.000020	<0.00002	<0.00002	< 0.000020	< 0.000020
Benzo(b,j) fluoranthene	**0.00007**		0.00004	FW			*< 0.000050*	*< 0.000050*	*< 0.000050*	*< 0.000050*	<0.00001	*< 0.000050*	*< 0.000050*	<0.00001	*< 0.000050*	*< 0.000050*	*< 0.000050*	*< 0.000050*	*< 0.000050*	<0.00003	<0.00001	*< 0.000050*	*< 0.000050*
Fluorene	**0.15**	0.12	0.003	FW			< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00002	< 0.000050	< 0.000050	<0.00002	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00005	<0.00002	< 0.000050	< 0.000050
Indeno(1,2,3-c,d)pyrene			0.00023	FW			< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	<0.00001	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00005	<0.00001	< 0.000050	< 0.000050
Naphthalene	**0.08**	0.01	0.0011	FW			< 0.00010	< 0.00010	< 0.00010	< 0.00010	<0.00005	< 0.00010	< 0.00010	<0.00005	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	<0.0001	<0.00005	0.00012	0.00011
Phenanthrene		0.003	0.0004	FW			< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00004	< 0.000050	< 0.000050	<0.00004	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00005	<0.00004	< 0.000050	< 0.000050
Pyrene	**0.1**	0.0002	0.000025	FW			< 0.000020	< 0.000020	< 0.000020	< 0.000020	<0.00002	< 0.000020	< 0.000020	<0.00002	< 0.000020	< 0.000020	< 0.000020	< 0.000020	< 0.000020	<0.00002	<0.00002	< 0.000020	< 0.000020
Quinoline	**0.00005**	0.034	0.0034	FW			*< 0.00024*	*< 0.00024*	*< 0.00024*	*< 0.00024*	*<0.0001*	*< 0.00024*	*< 0.00024*	*<0.0001*	*< 0.00024*	*< 0.00024*	*< 0.00024*	*< 0.00024*	*< 0.00024*	<0.00002	*<0.0001*	*< 0.00024*	*< 0.00024*
2-methylnaphthalene	**0.015**		0.18				< 0.00010	< 0.00010	< 0.00010	< 0.00010	<0.00005	< 0.00010	< 0.00010	<0.00005	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	<0.0001	<0.00005	< 0.00010	< 0.00010
1-Methylnaphthalene	**0.0055**		0.18				-	-	-	-	<0.00005	-	-	<0.00005	-	-	-	-	-	-	<0.00005	-	-
PAH, Low Molecular Weight							< 0.00024	< 0.00024	< 0.00024	< 0.00024	-	< 0.00024	< 0.00024	-	< 0.00024	< 0.00024	< 0.00024	< 0.00024	< 0.00024	<0.0001	-	< 0.00024	< 0.00024
PAH, High Molecular Weight							< 0.000050	< 0.000050	< 0.000050	< 0.000050	-	< 0.000050	< 0.000050	-	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00005	-	< 0.000050	< 0.000050
Total PAH							< 0.00024	< 0.00024	< 0.00024	< 0.00024	-	< 0.00024	< 0.00024	-	< 0.00024	< 0.00024	< 0.00024	< 0.00024	< 0.00024	<0.0001	-	< 0.00024	< 0.00024

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.

Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied

AO = Aesthetic Objective; OG = Operational Guideline
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
PAHs = polycyclic aromatic hydrocarbons
EPH (C10-C19) = extractable petroleum hydrocarbons, carbon range 10-19; LEPH = light extractable petroleum hydrocarbons
EPH (C19-C32) = extractable petroleum hydrocarbons, carbon range 19-32; HEPH = heavy extractable petroleum hydrocarbons
VH (C6-C10) = volatile hydrocarbons, carbon range 6-10; VPH = volatile petroleum hydrocarbons

Table 19
Results of Groundwater Analyses - Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19-MW17-01S	K19-MW17-01D	K19-MW17-01D	K19-MW17-02	K19-MW17-02	K19-MW17-04	K19-MW17-05	K19-MW17-05	K19-MW17-06	K19-MW17-06	K19-MW17-07	K19-MW17-07	K19-MW17-10	K19-MW17-11	K19-MW17-11	K19-MW17-12
Sample Control Number							03844-04	03375-06	3809-02	03375-05	3809-04	03765-02	03375-07	03798-01	06689-06	03815-05	06690-01	03815-02	03765-01	06706-02	03830-01	06690-08
Laboratory ID							17N243343	B709734	17N238668	B709734	17N238668	17N243343	B709734	17N243826	B709775	17N242036	B710365	17N242036	17N243343	B710365	17N240971	B710365
Date Sampled							23-Jul-17	5-Feb-17	15-Jul-17	5-Feb-17	15-Jul-17	25-Jul-17	5-Feb-17	27-Jul-17	6-Feb-17	20-Jul-17	7-Feb-17	20-Jul-17	25-Jul-17	8-Feb-17	16-Jul-17	9-Feb-17
QA/QC																						
APEC/ AEC							1b	1b	1b	1b	1b		7b, 23a	7b, 23a	7a, 23a	7a, 23a	2b, 20	2b, 20	7b, 23a	5, 24	5, 24	19
Non-Halogenated Volatiles																						
Benzene	**0.005**	0.4	0.088	L	0.005		**1.9**	-	<0.0005	<0.0004	<0.0005	<0.0005	<0.0004	<0.0005	<0.0004	-	<0.0004	-	<0.0005	<0.0004	<0.0005	<0.0004
Ethylbenzene	**0.14**	2	3.2	L	0.0016	AO	0.134	-	<0.0005	<0.0004	<0.0005	<0.0005	<0.0004	<0.0005	<0.0004	-	<0.0004	-	<0.0005	<0.0004	<0.0005	<0.0004
Toluene	**0.06**	0.005	4.9	L	0.024	AO	**0.138**	-	<0.0005	<0.0004	<0.0005	<0.0005	<0.0004	<0.0005	<0.0004	-	<0.0004	-	<0.0005	<0.0004	<0.0005	<0.0004
Xylenes	**0.09**	0.3	13	L	0.02	AO	**0.146**	-	<0.001	<0.0004	<0.001	<0.001	<0.0004	<0.001	<0.0004	-	<0.0004	-	<0.001	<0.0004	<0.001	<0.0004
ortho-Xylene							0.016	-	<0.0005	<0.0004	<0.0005	<0.0005	<0.0004	<0.0005	<0.0004	-	<0.0004	-	<0.0005	<0.0004	<0.0005	<0.0004
meta- & para-Xylene							0.13	-	<0.0005	<0.0004	<0.0005	<0.0005	<0.0004	<0.0005	<0.0004	-	<0.0004	-	<0.0005	<0.0004	<0.0005	<0.0004
Methyl t-butyl ether (MTBE)	**0.095**	34	6.1	I	0.015	AO	<0.001	-	<0.001	<0.004	0.005	<0.001	<0.004	<0.001	<0.004	-	<0.004	-	<0.001	<0.004	<0.001	<0.004
Styrene	**0.8**	0.72	0.072	FW			<0.0005	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	-	<0.0005	-	<0.0005	<0.0005	<0.0005	<0.0005
Hydrocarbons																						
EPH (C10-C19)	**5**	5					1.52	0.3	<0.1	<0.2	<0.1	<0.1	<0.2	<0.1	<0.2	<0.1	<0.2	<0.1	<0.1	<0.2	<0.1	<0.2
LEPH		0.5					1.51	0.3	<0.1	<0.2	<0.1	<0.1	<0.2	<0.1	<0.2	<0.1	<0.2	<0.1	<0.1	<0.2	<0.1	<0.2
EPH (C19-C32)							0.11	0.52	<0.1	<0.2	<0.1	<0.1	<0.2	<0.1	<0.2	<0.1	<0.2	<0.1	<0.1	<0.2	<0.1	<0.2
HEPH							0.11	0.52	<0.1	<0.2	<0.1	<0.1	<0.2	<0.1	<0.2	<0.1	<0.2	<0.1	<0.1	<0.2	<0.1	<0.2
Volatile Hydrocarbons (VH6-10)	**15**	15					5.04	-	<0.1	<0.3	<0.1	<0.1	<0.3	<0.1	<0.3	<0.1	<0.3	<0.1	<0.1	<0.3	<0.1	<0.3
VPH (C6-C10)		1.5					2.72	-	<0.1	<0.3	<0.1	<0.1	<0.3	<0.1	<0.3	<0.1	<0.3	<0.1	<0.1	<0.3	<0.1	<0.3
F2			1.3				1.51		-		-	-		-		<0.1		-	-		-	
F3							0.19		-		-	-		-		<0.1		-	-		-	
F4							<0.1		-		-	-		-		<0.1		-	-		-	
Polycyclic Aromatic Hydrocarbons																						
Acenaphthene	**0.25**	0.06	0.0058	FW			<0.00002	<0.00005	<0.00002	<0.00005	<0.00002	<0.00002	<0.00005	<0.00002	<0.00005	<0.00002	<0.00005	<0.00002	<0.00002	<0.00005	<0.00002	<0.00005
Acenaphthylene			0.046	FW			<0.00002	<0.00005	<0.00002	<0.00005	<0.00002	<0.00002	<0.00005	<0.00002	<0.00005	<0.00002	<0.00005	<0.00002	<0.00002	<0.00005	<0.00002	<0.00005
Acridine		0.0005	0.00005	FW			<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Anthracene	**1**	0.001	0.000012	FW			<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Benz(a)anthracene	**0.00007**	0.001	0.000018	FW			<0.00001	0.000015	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Benzo(a)pyrene	**0.00001**	0.0001	0.000017	FW	0.00001		<0.00001	**0.000015**	<0.00001	<0.000009	<0.00001	<0.00001	<0.000009	<0.00001	<0.000009	<0.00001	<0.000009	<0.00001	<0.00001	<0.000005	<0.00001	<0.000005
Benzo(b)fluoranthene							<0.00001	-	<0.00001	-	<0.00001	<0.00001	-	<0.00001	-	<0.00001	-	<0.00001	<0.00001	-	<0.00001	-
Benzo(g,h,i)perylene			0.00021	FW			<0.00001	<0.00005	<0.00001	<0.00005	<0.00001	<0.00001	<0.00005	<0.00001	<0.00005	0.00001	<0.00005	<0.00001	<0.00001	<0.00005	<0.00001	<0.00005
Benzo(j)fluoranthene							<0.00001		<0.00001		<0.00001	<0.00001		<0.00001		<0.00001		<0.00001	<0.00001		<0.00001	
Benzo(k)fluoranthene			0.00048	FW			<0.00001	<0.00005	<0.00001	<0.00005	<0.00001	<0.00001	<0.00005	<0.00001	<0.00005	<0.00001	<0.00005	<0.00001	<0.00001	<0.00005	<0.00001	<0.00005
Chrysene	**0.007**	0.001	0.0014	FW			<0.00001	<0.00005	<0.00001	<0.00005	<0.00001	<0.00001	<0.00005	<0.00001	<0.00005	0.00001	<0.00005	<0.00001	<0.00001	<0.00005	<0.00001	<0.00005
Dibenz(a,h)anthracene	**0.00001**		0.00028	FW			<0.00001	<0.000006	<0.00001	<0.000006	<0.00001	<0.00001	<0.000006	<0.00001	<0.000006	<0.00001	<0.000006	<0.00001	<0.00001	<0.000003	<0.00001	<0.000003
Fluoranthene	**0.15**	0.002	0.00048	FW			<0.00002	0.000069	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Benzo(b,j) fluoranthene	**0.00007**		0.00004	FW			<0.00001	*<0.00005*	<0.00001	*<0.00005*	<0.00001	<0.00001	*<0.00005*	<0.00001	*<0.00005*	<0.00001	*<0.00005*	<0.00001	<0.00001	<0.00003	<0.00001	<0.00003
Fluorene	**0.15**	0.12	0.003	FW			0.00023	0.00015	<0.00002	<0.00005	<0.00002	<0.00002	<0.00005	<0.00002	<0.00005	<0.00002	<0.00005	<0.00002	<0.00002	<0.00005	<0.00002	<0.00005
Indeno(1,2,3-c,d)pyrene			0.00023	FW			<0.00001	<0.00005	<0.00001	<0.00005	<0.00001	<0.00001	<0.00005	<0.00001	<0.00005	<0.00001	<0.00005	<0.00001	<0.00001	<0.00005	<0.00001	<0.00005
Naphthalene	**0.08**	0.01	0.0011	FW			0.0155	0.00046	<0.00005	<0.0001	0.00007	<0.00005	<0.0001	<0.00005	<0.0001	0.00005	0.00012	<0.00005	<0.00005	<0.0001	<0.00005	0.00014
Phenanthrene		0.003	0.0004	FW			0.00011	0.00044	<0.00004	<0.00005	<0.00004	<0.00004	<0.00005	<0.00004	0.000059	0.00009	<0.00005	<0.00004	<0.00004	<0.00005	<0.00004	<0.00005
Pyrene	**0.1**	0.0002	0.000025	FW			<0.00002	0.000081	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Quinoline	**0.00005**	0.034	0.0034	FW			*<0.0001*	<0.00004	*<0.0001*	<0.00004	*<0.0001*	*<0.0001*	<0.00004	*<0.0001*	<0.00004	*<0.0001*	<0.00004	*<0.0001*	*<0.0001*	<0.00002	*<0.0001*	<0.00002
2-methylnaphthalene	**0.015**		0.18				0.00215	0.00097	<0.00005	0.00012	0.00007	<0.00005	<0.0001	<0.00005	0.00011	0.00008	<0.0001	<0.00005	<0.00005	<0.0001	<0.00005	<0.0001
1-Methylnaphthalene	**0.0055**		0.18				**0.00732**	-	<0.00005	-	0.00007	<0.00005	-	<0.00005	-	0.00006	-	<0.00005	<0.00005	-	<0.00005	-
PAH, Low Molecular Weight							-	0.002	-	0.00012	-	-	<0.0001	-	0.00017	-	0.00012	-	-	<0.0001	-	0.00014
PAH, High Molecular Weight							-	0.00018	-	<0.00005	-	-	<0.00005	-	<0.00005	-	<0.00005	-	-	<0.00005	-	<0.00005
Total PAH							-	0.0022	-	0.00012	-	-	<0.0001	-	0.00017	-	0.00012	-	-	<0.0001	-	0.00014

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.

Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied

AO = Aesthetic Objective; OG = Operational Guideline
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
PAHs = polycyclic aromatic hydrocarbons
EPH (C10-C19) = extractable petroleum hydrocarbons, carbon range 10-19; LEPH = light extractable petroleum hydrocarbons
EPH (C19-C32) = extractable petroleum hydrocarbons, carbon range 19-32; HEPH = heavy extractable petroleum hydrocarbons
VH (C6-C10) = volatile hydrocarbons, carbon range 6-10; VPH = volatile petroleum hydrocarbons

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 19
Results of Groundwater Analyses - Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19-MW17-12	K19-MW17-13	K19-MW17-13	K19-MW17-13	K19-MW17-17	K19-MW17-18	K19-MW17-19	K19-MW17-20	K19-MW17-21	K19-MW17-21	K19-MW17-22	K19-MW17-23	K19-MW17-24	K19-MW17-24	K19-MW17-25	K19-MW17-26	K19-MW17-27	K19-MW17-28	K19-MW17-29D
Sample Control Number							03815-01	06690-04	06690-05	03830-04	03797-02	03797-03	03765-03	03765-06	03765-04	03765-05	03762-04	03762-03	03797-04	03797-05	03797-06	03763-04	03798-02	03798-03	03762-07
Laboratory ID							17N242036	B710365	B710365	17N240971	17N243826	17N243826	17N243343	17N243343	17N243343	17N243343	17N244304	17N244304	17N243826	17N243826	17N243826	17N244304	17N243826	17N243826	17N244304
Date Sampled							20-Jul-17	8-Feb-17	8-Feb-17	16-Jul-17	26-Jul-17	26-Jul-17	25-Jul-17	25-Jul-17	25-Jul-17	25-Jul-17	28-Jul-17	28-Jul-17	26-Jul-17	26-Jul-17	26-Jul-17	30-Jul-17	27-Jul-17	27-Jul-17	28-Jul-17
QA/QC								FDA	FD						FDA	FD			FDA	FD					
APEC/ AEC							19	22	22	22	26	24	27	6	21	21	25	18	17	17	16	19	20	4	1b
Non-Halogenated Volatiles																									
Benzene	**0.005**	0.4	0.088	L	0.005		<0.0005	<0.0004	<0.0004	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	**0.14**	2	3.2	L	0.0016	AO	<0.0005	<0.0004	<0.0004	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	**0.06**	0.005	4.9	L	0.024	AO	<0.0005	<0.0004	<0.0004	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Xylenes	**0.09**	0.3	13	L	0.02	AO	<0.001	<0.0004	<0.0004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
ortho-Xylene							<0.0005	<0.0004	<0.0004	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
meta- & para-Xylene							<0.0005	<0.0004	<0.0004	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methyl t-butyl ether (MTBE)	**0.095**	34	6.1	I	0.015	AO	<0.001	<0.004	<0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Styrene	**0.8**	0.72	0.072	FW			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Hydrocarbons																									
EPH (C10-C19)	**5**	5					<0.1	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
LEPH		0.5					<0.1	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EPH (C19-C32)							<0.1	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HEPH							<0.1	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Volatile Hydrocarbons (VH6-10)	**15**	15					<0.1	<0.3	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
VPH (C6-C10)		1.5					<0.1	<0.3	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
F2			1.3				-			-	-	-	-	<0.1	-	-	<0.1	<0.1	-	-	-	-	-	-	<0.1
F3							-			-	-	-	-	<0.1	-	-	<0.1	<0.1	-	-	-	-	-	-	<0.1
F4							-			-	-	-	-	<0.1	-	-	<0.1	<0.1	-	-	-	-	-	-	<0.1
Polycyclic Aromatic Hydrocarbons																									
Acenaphthene	**0.25**	0.06	0.0058	FW			<0.00002	<0.00005	<0.00005	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Acenaphthylene			0.046	FW			<0.00002	<0.00005	<0.00005	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Acridine		0.0005	0.00005	FW			<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Anthracene	**1**	0.001	0.000012	FW			<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Benz(a)anthracene	**0.00007**	0.001	0.000018	FW			<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Benzo(a)pyrene	**0.00001**	0.0001	0.000017	FW	0.00001		<0.00001	<0.000005	<0.000005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Benzo(b)fluoranthene							<0.00001	-	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Benzo(g,h,i)perylene			0.00021	FW			<0.00001	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Benzo(j)fluoranthene							<0.00001			<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Benzo(k)fluoranthene			0.00048	FW			<0.00001	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Chrysene	**0.007**	0.001	0.0014	FW			<0.00001	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Dibenz(a,h)anthracene	**0.00001**		0.00028	FW			<0.00001	<0.000003	<0.000003	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Fluoranthene	**0.15**	0.002	0.00048	FW			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Benzo(b,j) fluoranthene	**0.00007**		0.00004	FW			<0.00001	<0.00003	<0.00003	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Fluorene	**0.15**	0.12	0.003	FW			<0.00002	<0.00005	<0.00005	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Indeno(1,2,3-c,d)pyrene			0.00023	FW			<0.00001	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Naphthalene	**0.08**	0.01	0.0011	FW			0.00006	0.0003	0.00032	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00006	0.00006	<0.00005	0.00015	<0.00005	<0.00005	<0.00005	0.00006	<0.00005	<0.00005	<0.00005
Phenanthrene		0.003	0.0004	FW			<0.00004	0.000076	0.000079	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	**0.1**	0.0002	0.000025	FW			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Quinoline	**0.00005**	0.034	0.0034	FW			*<0.0001*	<0.00002	<0.00002	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*
2-methylnaphthalene	**0.015**		0.18				<0.00005	0.00033	0.00032	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00011	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
1-Methylnaphthalene	**0.0055**		0.18				<0.00005	-	-	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00009	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
PAH, Low Molecular Weight							-	0.0007	0.00072	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, High Molecular Weight							-	<0.00005	<0.00005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PAH							-	0.0007	0.00072	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.

Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied

AO = Aesthetic Objective; OG = Operational Guideline
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
PAHs = polycyclic aromatic hydrocarbons
EPH (C10-C19) = extractable petroleum hydrocarbons, carbon range 10-19; LEPH = light extractable petroleum hydrocarbons
EPH (C19-C32) = extractable petroleum hydrocarbons, carbon range 19-32; HEPH = heavy extractable petroleum hydrocarbons
VH (C6-C10) = volatile hydrocarbons, carbon range 6-10; VPH = volatile petroleum hydrocarbons

Table 19
Results of Groundwater Analyses - Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19-MW17-29S	K19-MW17-30	K19-MW17-31	K19-MW17-32	K19-MW17-33	K19-MW17-34	K19-MW17-35D	K19-MW17-35D	K19-MW17-35S	K19 DW WELL	K19 DW WELL	K19-Onsite Water Src	Pink MTN	DRILL WATER
Sample Control Number							03763-05	03762-01	03762-02	03798-04	03762-05	03762-06	03763-01	03763-02	03763-06	DUP-DW-K19	K19 DW WELL	K19-Onsite Water Src	DRILL WATER/PINKMTN/SA1	03605-01
Laboratory ID							17N244304	17N244304	17N244304	17N243826	17N244304	17N244304	17N244304	17N244304	17N244304	B648667	B648667	B619935	B618204	17N244304
Date Sampled							30-Jul-17	28-Jul-17	29-Jul-17	27-Jul-17	28-Jul-17	28-Jul-17	29-Jul-17 FDA	29-Jul-17 FD	30-Jul-17	15-Jun-16 FD	15-Jun-16 FDA	11-Mar-16	8-Mar-16	27-Jul-17
QA/QC																				
APEC/ AEC							1b	12	11	1d	14	15	1b	1b	1b	n/a	n/a	n/a	n/a	n/a
Non-Halogenated Volatiles																				
Benzene	**0.005**	0.4	0.088	L	0.005		**0.0538**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.574**	**0.569**	**0.0173**	< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.0005
Ethylbenzene	**0.14**	2	3.2	L	0.0016	AO	0.0043	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	0.0005	0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.0005
Toluene	**0.06**	0.005	4.9	L	0.024	AO	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.02	0.0202	<0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.0005
Xylenes	**0.09**	0.3	13	L	0.02	AO	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001	<0.001	< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.001
ortho-Xylene							<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	0.0005	<0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.0005
meta- & para-Xylene							0.0061	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0008	0.0009	<0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.0005
Methyl t-butyl ether (MTBE)	**0.095**	34	6.1	I	0.015	AO	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.0040	< 0.0040	< 0.0040	< 0.0040	<0.001
Styrene	**0.8**	0.72	0.072	FW			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005
Hydrocarbons																				
EPH (C10-C19)	**5**	5					0.65	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	< 0.20	< 0.20	< 0.20	< 0.20	<0.1
LEPH		0.5					0.63	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	< 0.20	< 0.20	< 0.20	< 0.20	<0.1
EPH (C19-C32)							<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	< 0.20	< 0.20	< 0.20	< 0.20	0.26
HEPH							<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	< 0.20	< 0.20	< 0.20	< 0.20	0.26
Volatile Hydrocarbons (VH6-10)	**15**	15					0.17	<0.1	<0.1	<0.1	<0.1	<0.1	0.64	0.63	<0.1	< 0.3	< 0.3	< 0.3	< 0.3	<0.1
VPH (C6-C10)		1.5					0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	< 0.3	< 0.3	< 0.3	< 0.3	<0.1
F2			1.3				0.61	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	<0.1					-
F3							0.14	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	<0.1					-
F4							<0.1	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	<0.1					-
Polycyclic Aromatic Hydrocarbons																				
Acenaphthene	**0.25**	0.06	0.0058	FW			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.0012	0.0012	< 0.000050	< 0.000050	<0.00002
Acenaphthylene			0.046	FW			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00002
Acridine		0.0005	0.00005	FW			<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00037	0.00038	< 0.000050	< 0.000050	<0.00005
Anthracene	**1**	0.001	0.000012	FW			<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.000064	0.000062	< 0.000010	< 0.000010	<0.00001
Benz(a)anthracene	**0.00007**	0.001	0.000018	FW			<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.000049	0.000052	< 0.000010	< 0.000010	<0.00001
Benzo(a)pyrene	**0.00001**	0.0001	0.000017	FW	0.00001		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	**0.000049**	**0.000054**	< 0.0000090	< 0.0000090	<0.00001
Benzo(b)fluoranthene							<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	-	-	-	-	<0.00001
Benzo(g,h,i)perylene			0.00021	FW			<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00001
Benzo(j)fluoranthene							<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001					<0.00001
Benzo(k)fluoranthene			0.00048	FW			<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.000065	0.00006	< 0.000050	< 0.000050	<0.00001
Chrysene	**0.007**	0.001	0.0014	FW			<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.000079	0.000076	< 0.000050	< 0.000050	<0.00001
Dibenz(a,h)anthracene	**0.00001**		0.00028	FW			<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	*< 0.000050*	*< 0.000050*	*< 0.000050*	*< 0.000050*	<0.00001
Fluoranthene	**0.15**	0.002	0.00048	FW			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00083	0.00083	< 0.000020	< 0.000020	<0.00002
Benzo(b,j) fluoranthene	**0.00007**		0.00004	FW			<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	**0.00024**	**0.00024**	*< 0.000050*	*< 0.000050*	<0.00001
Fluorene	**0.15**	0.12	0.003	FW			0.00021	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00053	0.00052	< 0.000050	< 0.000050	<0.00002
Indeno(1,2,3-c,d)pyrene			0.00023	FW			<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00001
Naphthalene	**0.08**	0.01	0.0011	FW			0.0235	<0.00005	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.0021	0.0021	< 0.00010	0.00036	0.00016
Phenanthrene		0.003	0.0004	FW			0.00007	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	0.00044	0.00043	< 0.000050	< 0.000050	<0.00004
Pyrene	**0.1**	0.0002	0.000025	FW			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00075	0.00074	< 0.000020	< 0.000020	<0.00002
Quinoline	**0.00005**	0.034	0.0034	FW			*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	**0.00055**	**0.00056**	*< 0.00024*	*< 0.00024*	*<0.0001*
2-methylnaphthalene	**0.015**		0.18				0.00599	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005	0.00031	0.0003	< 0.00010	< 0.00010	<0.00005
1-Methylnaphthalene	**0.0055**		0.18				**0.0117**	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	-	-	-	-	<0.00005
PAH, Low Molecular Weight							-	-	-	-	-	-	-	-	-	0.0056	0.0055	< 0.00024	0.00036	-
PAH, High Molecular Weight							-	-	-	-	-	-	-	-	-	0.0021	0.002	< 0.000050	< 0.000050	-
Total PAH							-	-	-	-	-	-	-	-	-	0.0076	0.0076	< 0.00024	0.00036	-

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.

Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied

AO = Aesthetic Objective; OG = Operational Guideline
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
PAHs = polycyclic aromatic hydrocarbons
EPH (C10-C19) = extractable petroleum hydrocarbons, carbon range 10-19; LEPH = light extractable petroleum hydrocarbons
EPH (C19-C32) = extractable petroleum hydrocarbons, carbon range 19-32; HEPH = heavy extractable petroleum hydrocarbons
VH (C6-C10) = volatile hydrocarbons, carbon range 6-10; VPH = volatile petroleum hydrocarbons

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 20
Results of Groundwater Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19A-09MW-01	K19A-09MW-01	K19A-09MW-01	K19A-09MW-02	K19A-09MW-03	K19A-09MW-03	K19A-09MW-03	K19A-09MW-04	K19A-09MW-05	K19A-09MW-05	K19A-09MW-06	K19A-09MW-06	K19A-09MW-06	K19A-09MW-07
Sample Control Number							K19A-09MW-01	03375-01	03375-02	06706-05	-	K19A-09MW-03	06706-04	K19A-09MW-04	K19A-09MW-05	MWA	-	K19A-09MW-06	06706-01	K19A-09MW-07
Laboratory ID							B648291	B709734	B709734	B710365	101110157	B646703	B710365	B646703	B646703	B646703	101110157	B646703	B710365	B648667
Date Sampled							10-Jun-16	4-Feb-17	4-Feb-17	9-Feb-17	7-Nov-09	9-Jun-16	9-Feb-17	7-Jun-16	7-Jun-16	7-Jun-16	5-Nov-09	7-Jun-16	8-Feb-17	13-Jun-16
QA/QC								FDA	FD						FDA	FD				
APEC/ AEC																				
Volatile Organic Compounds																				
Acetone	**3.5**		13																	
Bromodichloromethane	**0.1**		8.5	FW			< 0.0010	<0.001	<0.001	<0.001	<0.0001	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.0001	< 0.0010	<0.001	< 0.0010
Bromomethane	**0.0055**		0.056	I			< 0.0010	<0.001	<0.001	<0.001	<0.0008	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.0008	< 0.0010	<0.001	< 0.0010
Dibromomethane							-	-	-	-	<0.0002	-	-	-	-	-	<0.0002	-	-	-
Bromoform	**0.1**		0.77	I			< 0.0010	<0.001	<0.001	<0.001	<0.0002	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.0002	< 0.0010	<0.001	< 0.0010
Carbon Tetrachloride	**0.002**	0.13	0.005	L	0.002		< 0.00050	<0.0005	<0.0005	<0.0005	<0.0001	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	<0.0001	< 0.00050	<0.0005	< 0.00050
Chlorobenzene	**0.08**	0.013	0.0013	FW	0.08	AO	< 0.00050	<0.0005	<0.0005	<0.0005	<0.0001	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	<0.0001	< 0.00050	<0.0005	< 0.00050
Chloroethane							< 0.0010	<0.001	<0.001	<0.001	<0.0004	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.0004	< 0.0010	<0.001	< 0.0010
Chloroform	**0.1**	0.02	0.0018	FW			< 0.0010	<0.001	<0.001	<0.001	<0.0003	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.0003	< 0.0010	<0.001	< 0.0010
Chloromethane							< 0.0010	<0.001	<0.001	<0.001	<0.0004	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.0004	< 0.0010	<0.001	< 0.0010
Dichloromethane	**0.05**	0.98	0.05	L	0.05		< 0.0020	<0.002	<0.002	<0.002	<0.006	< 0.0020	<0.002	< 0.0020	< 0.0020	< 0.0020	<0.006	< 0.0020	<0.002	< 0.0020
Dibromochloromethane	**0.1**		0.1	L			< 0.0010	<0.001	<0.001	<0.001	<0.0001	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.0001	< 0.0010	<0.001	< 0.0010
1,2-dibromoethane (Ethylene Dibromide)	**0.0005**		0.00083	I			< 0.00020	<0.0002	<0.0002	<0.0002	<0.0001	< 0.00020	<0.0002	< 0.00020	< 0.00020	< 0.00020	<0.0001	< 0.00020	<0.0002	< 0.00020
1,2-Dichlorobenzene	**0.2**	0.007	0.0007	FW	0.003	AO	< 0.00050	<0.0005	<0.0005	<0.0005	<0.0001	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	<0.0001	< 0.00050	<0.0005	< 0.00050
1,3-Dichlorobenzene		1.5	0.15	FW			< 0.00050	<0.0005	<0.0005	<0.0005	<0.0001	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	<0.0001	< 0.00050	<0.0005	< 0.00050
1,4-Dichlorobenzene	**0.005**	0.26	0.026	FW	0.001	AO	< 0.00050	<0.0005	<0.0005	<0.0005	<0.0001	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	<0.0001	< 0.00050	<0.0005	< 0.00050
Dichlorodifluoromethane (Freon 12)	**0.8**						< 0.0020	<0.002	<0.002	<0.002	<0.0002	< 0.0020	<0.002	< 0.0020	< 0.0020	< 0.0020	<0.0002	< 0.0020	<0.002	< 0.0020
1,1-Dichloroethane	**0.03**		3.1	I			< 0.00050	<0.0005	<0.0005	<0.0005	<0.0001	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	<0.0001	< 0.00050	<0.0005	< 0.00050
1,2-Dichloroethane	**0.005**	1	0.005	L	0.005		< 0.00050	<0.0005	<0.0005	<0.0005	<0.0004	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	<0.0004	< 0.00050	<0.0005	< 0.00050
1,1-Dichloroethylene	**0.014**		0.68	I	0.014		< 0.00050	<0.0005	<0.0005	<0.0005	<0.0001	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	<0.0001	< 0.00050	<0.0005	< 0.00050
cis-1,2-Dichloroethylene	**0.008**		0.017	I			< 0.0010	<0.001	<0.001	<0.001	<0.0001	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.0001	< 0.0010	<0.001	< 0.0010
trans-1,2-Dichloroethylene	**0.08**		0.017	I			< 0.0010	<0.001	<0.001	<0.001	<0.0001	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.0001	< 0.0010	<0.001	< 0.0010
1,2-Dichloropropane	**0.0045**		0.14	I			< 0.00050	<0.0005	<0.0005	<0.0005	<0.0001	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	<0.0001	< 0.00050	<0.0005	< 0.00050
cis-1,3-Dichloropropylene	**0.0015**						< 0.0010	<0.001	<0.001	<0.001	<0.0001	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.0001	< 0.0010	<0.001	< 0.0010
trans-1,3-Dichloropropylene	**0.0015**						< 0.0010	<0.001	<0.001	<0.001	<0.0001	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.0001	< 0.0010	<0.001	< 0.0010
1,1,1,2-Tetrachloroethane	**0.006**		0.028	I			< 0.00050	<0.0005	<0.0005	<0.0005	-	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	-	< 0.00050	<0.0005	< 0.00050
1,1,2,2-Tetrachloroethane	**0.0008**		0.015	I			< 0.00050	<0.0005	<0.0005	<0.0005	<0.0002	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	<0.0002	< 0.00050	<0.0005	< 0.00050
Tetrachloroethylene	**0.03**	1.1	0.11	FW	0.03		< 0.00050	<0.0005	<0.0005	<0.0005	<0.0001	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	<0.0001	< 0.00050	<0.0005	< 0.00050
1,1,1-Trichloroethane	**8**		0.11	FW			< 0.00050	<0.0005	<0.0005	<0.0005	<0.0001	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	<0.0001	< 0.00050	<0.0005	< 0.00050
1,1,2-Trichloroethane	**0.003**		0.03	I			< 0.00050	<0.0005	<0.0005	<0.0005	<0.0001	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	<0.0001	< 0.00050	<0.0005	< 0.00050
Trichloroethylene	**0.005**	0.2	0.005	L	0.005		< 0.00050	<0.0005	<0.0005	<0.0005	<0.0001	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	<0.0001	< 0.00050	<0.0005	< 0.00050
Trichlorofluoromethane (Freon 11)	**1**						< 0.0040	<0.004	<0.004	<0.004	<0.0002	< 0.0040	<0.004	< 0.0040	< 0.0040	< 0.0040	<0.0002	< 0.0040	<0.004	< 0.0040
Trihalomethanes (Total)																				
Vinyl Chloride	**0.002**		0.018	I	0.002		< 0.00050	<0.0005	<0.0005	<0.0005	<0.0002	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	<0.0002	< 0.00050	<0.0005	< 0.00050
2-Butanone	**2.5**		150	FW			-	-	-	-	<0.005	-	-	-	-	-	<0.005	-	-	-
2-Hexanone	**0.02**						-	-	-	-	<0.02	-	-	-	-	-	<0.02	-	-	-
4-Methyl-2-pentanone			58	FW			-	-	-	-	<0.002	-	-	-	-	-	<0.002	-	-	-
Freon 113	**100**						< 0.0020	<0.002	<0.002	<0.002	-	< 0.0020	<0.002	< 0.0020	< 0.0020	< 0.0020	-	< 0.0020	<0.002	< 0.0020
1,2,3-Trichlorobenzene	**0.003**	0.08					< 0.0020	<0.002	<0.002	<0.002	-	< 0.0020	<0.002	< 0.0020	< 0.0020	< 0.0020	-	< 0.0020	<0.002	< 0.0020
1,2,4-Trichlorobenzene	**0.0055**	0.24					< 0.0020	<0.002	<0.002	<0.002	-	< 0.0020	<0.002	< 0.0020	< 0.0020	< 0.0020	-	< 0.0020	<0.002	< 0.0020
Hexachlorobutadiene	**0.002**	0.015					< 0.00050	<0.0005	<0.0005	<0.0005	-	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	-	< 0.00050	<0.0005	< 0.00050

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.
Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.
B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)
Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.
Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied
AO = Aesthetic Objective; OG = Operational Guideline
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
[1] = Sample re-analyzed for dichloromethane was past method-specified hold time. Re-analysis yielded a concentration of <0.002 mg/L

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 20
Results of Groundwater Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19A-09MW-08	K19A-09MW-09	K19A-09MW-09	K19A-09MW-10	K19A-10MW-02	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	K19A-10MW-04	K19A-10MW-04	K19A-10MW10	K19A-10MW-10	K19A-10MW-10	K19A-10MW-19
Sample Control Number							K19A-09MW-08	K19A-09MW-09	06706-03	K19A-09MW-10	K19A-10MW-02	K19A-10MW-03	SAMPLE E	06690-02	3808-06	K19A-10MW-04	K19A-10MW-04	03375-04	K19A-10MW-10	K19A-10MW-10	K19A-10MW-19
Laboratory ID							B648667	B650178	B710365	B650178	B648291	B650178	B650178	B710365	17N238668	B086989	B648667	B709734	B086989	B646703	B648667
Date Sampled							13-Jun-16	16-Jun-16	8-Feb-17	16-Jun-16	10-Jun-16	16-Jun-16	16-Jun-16	7-Feb-17	14-Jul-17	13-Sep-10	15-Jun-16	4-Feb-17	13-Sep-10	8-Jun-16	13-Jun-16
QA/QC												FDA	FD								
APEC/ AEC												1b	1b	1b	1b						
Volatile Organic Compounds																					
Acetone	**3.5**		13												<0.01						
Bromodichloromethane	**0.1**		8.5	FW			< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.001	<0.001	< 0.0010	<0.001	<0.001	< 0.0010	< 0.0010
Bromomethane	**0.0055**		0.056	I			< 0.0010	< 0.0020	<0.001	< 0.0020	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.001	<0.001	< 0.0010	<0.001	<0.001	< 0.0010	< 0.0010
Dibromomethane							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	**0.1**		0.77	I			< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.001	<0.001	< 0.0010	<0.001	<0.001	< 0.0010	< 0.0010
Carbon Tetrachloride	**0.002**	0.13	0.005	L	0.002		< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.0005	<0.001	< 0.00050	<0.0005	<0.001	< 0.00050	< 0.00050
Chlorobenzene	**0.08**	0.013	0.0013	FW	0.08	AO	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	<0.0005	< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050
Chloroethane							< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.001	<0.001	< 0.0010	<0.001	<0.001	< 0.0010	< 0.0010
Chloroform	**0.1**	0.02	0.0018	FW			< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.001	<0.001	< 0.0010	<0.001	<0.001	< 0.0010	< 0.0010
Chloromethane							< 0.0010	< 0.0020	<0.001	< 0.0020	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.001	<0.001	< 0.0010	<0.001	<0.001	< 0.0010	< 0.0010
Dichloromethane	**0.05**	0.98	0.05	L	0.05		< 0.0020	< 0.0020	<0.002	< 0.0020	< 0.0020	< 0.0020	< 0.0020	<0.002	<0.001	<0.002	< 0.0020	<0.002	<0.002	< 0.0020	< 0.0020
Dibromochloromethane	**0.1**		0.1	L			< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.001	<0.001	< 0.0010	<0.001	<0.001	< 0.0010	< 0.0010
1,2-dibromoethane (Ethylene Dibromide)	**0.0005**		0.00083	I			< 0.00020	< 0.00020	<0.0002	< 0.00020	< 0.00020	< 0.00020	< 0.00020	<0.0002	<0.0003	<0.0002	< 0.00020	<0.0002	<0.0002	< 0.00020	< 0.00020
1,2-Dichlorobenzene	**0.2**	0.007	0.0007	FW	0.003	AO	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.0005	<0.0005	< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050
1,3-Dichlorobenzene		1.5	0.15	FW			< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.0005	<0.0005	< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050
1,4-Dichlorobenzene	**0.005**	0.26	0.026	FW	0.001	AO	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.0005	<0.0005	< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050
Dichlorodifluoromethane (Freon 12)	**0.8**						< 0.0020	< 0.0020	<0.002	< 0.0020	< 0.0020	< 0.0020	< 0.0020	<0.002	<0.001	-	< 0.0020	<0.002	-	< 0.0020	< 0.0020
1,1-Dichloroethane	**0.03**		3.1	I			< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	<0.0005	< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050
1,2-Dichloroethane	**0.005**	1	0.005	L	0.005		< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	<0.0005	< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050
1,1-Dichloroethylene	**0.014**		0.68	I	0.014		< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	<0.0005	< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050
cis-1,2-Dichloroethylene	**0.008**		0.017	I			< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.001	<0.001	< 0.0010	<0.001	<0.001	< 0.0010	< 0.0010
trans-1,2-Dichloroethylene	**0.08**		0.017	I			< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.001	<0.001	< 0.0010	<0.001	<0.001	< 0.0010	< 0.0010
1,2-Dichloropropane	**0.0045**		0.14	I			< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	<0.0005	< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050
cis-1,3-Dichloropropylene	**0.0015**						< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.001	<0.001	< 0.0010	<0.001	<0.001	< 0.0010	< 0.0010
trans-1,3-Dichloropropylene	**0.0015**						< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.001	<0.001	< 0.0010	<0.001	<0.001	< 0.0010	< 0.0010
1,1,1,2-Tetrachloroethane	**0.006**		0.028	I			< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	<0.0005	< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050
1,1,2,2-Tetrachloroethane	**0.0008**		0.015	I			< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	*<0.001*	<0.0005	< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050
Tetrachloroethylene	**0.03**	1.1	0.11	FW	0.03		< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	<0.0005	< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050
1,1,1-Trichloroethane	**8**		0.11	FW			< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	<0.0005	< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050
1,1,2-Trichloroethane	**0.003**		0.03	I			< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	<0.0005	< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050
Trichloroethylene	**0.005**	0.2	0.005	L	0.005		< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	<0.0005	< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050
Trichlorofluoromethane (Freon 11)	**1**						< 0.0040	< 0.0040	<0.004	< 0.0040	< 0.0040	< 0.0040	< 0.0040	<0.004	<0.001	<0.004	< 0.0040	<0.004	<0.004	< 0.0040	< 0.0040
Trihalomethanes (Total)															<0.002						
Vinyl Chloride	**0.002**		0.018	I	0.002		< 0.00050	< 0.0010	<0.0005	< 0.0010	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	<0.0005	< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050
2-Butanone	**2.5**		150	FW			-	-	-	-	-	-	-	-	<0.01	-	-	-	-	-	-
2-Hexanone	**0.02**						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone			58	FW			-	-	-	-	-	-	-	-	<0.01	-	-	-	-	-	-
Freon 113	**100**						< 0.0020	< 0.0020	<0.002	< 0.0020	< 0.0020	< 0.0020	< 0.0020	<0.002	-	-	< 0.0020	<0.002	-	< 0.0020	< 0.0020
1,2,3-Trichlorobenzene	**0.003**	0.08					< 0.0020	< 0.0020	<0.002	< 0.0020	< 0.0020	< 0.0020	< 0.0020	<0.002	<0.001	-	< 0.0020	<0.002	-	< 0.0020	< 0.0020
1,2,4-Trichlorobenzene	**0.0055**	0.24					< 0.0020	< 0.0020	<0.002	< 0.0020	< 0.0020	< 0.0020	< 0.0020	<0.002	<0.001	-	< 0.0020	<0.002	-	< 0.0020	< 0.0020
Hexachlorobutadiene	**0.002**	0.015					< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	-	< 0.00050	<0.0005	-	< 0.00050	< 0.00050

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.
Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.
B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)
Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.
Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied
AO = Aesthetic Objective; OG = Operational Guideline
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
[1] = Sample re-analyzed for dichloromethane was past method-specified hold time. Re-analysis yielded a concentration of <0.002 mg/L

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 20
Results of Groundwater Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19A-10MW-20	K19A-10MW-20	K19A-10MW-21	K19A-10MW-21	K19A-10MW-24	K19A-10MW-24	K19-10MW-24	K19A-10MW-26	K19A-10MW-26	K19A-10MW-28	K19A-10MW-29	K19B-09MW-01	K19B-09MW-02	K19B-09MW-02
Sample Control Number							K19A-10MW-20	06689-02	K19A-10MW-21	06689-03	06689-04	06689-05	03816-04	K19A-10MW-26	K19A-10MW-26	06690-03	K19A-10MW-29	-	-	K19B-09MW-02
Laboratory ID							B650178	B709775	B650178	B709775	B709775	B709775	17N242036	B086989	B648291	B710365	B648291	101105151	101105151	B650178
Date Sampled							16-Jun-16	5-Feb-17	16-Jun-16	5-Feb-17	6-Feb-17	6-Feb-17	21-Jul-17	13-Sep-10	11-Jun-16	8-Feb-17	10-Jun-16	4-Nov-09	4-Nov-09	19-Jun-16
QA/QC											FDA	FD								FDA
APEC/ AEC																				
Volatile Organic Compounds																				
Acetone	**3.5**		13										-							
Bromodichloromethane	**0.1**		8.5	FW			< 0.0010	<0.001	< 0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.0010	<0.001	< 0.0010	<0.0001	<0.0001	< 0.0010
Bromomethane	**0.0055**		0.056	I			< 0.0020	<0.001	< 0.0020	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.0010	<0.001	< 0.0010	<0.0008	<0.0008	< 0.0010
Dibromomethane							-	-	-	-	-	-	-	-	-	-	-	<0.0002	<0.0002	-
Bromoform	**0.1**		0.77	I			< 0.0010	<0.001	< 0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.0010	<0.001	< 0.0010	<0.0002	<0.0002	< 0.0010
Carbon Tetrachloride	**0.002**	0.13	0.005	L	0.002		< 0.00050	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	< 0.00050	<0.0005	< 0.00050	<0.0001	<0.0001	< 0.00050
Chlorobenzene	**0.08**	0.013	0.0013	FW	0.08	AO	< 0.00050	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	< 0.00050	<0.0005	< 0.00050	<0.0001	<0.0001	< 0.00050
Chloroethane							< 0.0010	<0.001	< 0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.0010	<0.001	< 0.0010	<0.0004	<0.0004	< 0.0010
Chloroform	**0.1**	0.02	0.0018	FW			< 0.0010	<0.001	< 0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.0010	<0.001	< 0.0010	<0.0003	<0.0003	< 0.0010
Chloromethane							< 0.0020	<0.001	< 0.0020	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.0010	<0.001	< 0.0010	<0.0004	<0.0004	< 0.0010
Dichloromethane	**0.05**	0.98	0.05	L	0.05		< 0.0020	<0.002	< 0.0020	<0.002	**0.13[1]**	<0.002	<0.001	<0.002	< 0.0020	<0.002	< 0.0020	<0.006	<0.006	< 0.0020
Dibromochloromethane	**0.1**		0.1	L			< 0.0010	<0.001	< 0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.0010	<0.001	< 0.0010	<0.0001	<0.0001	< 0.0010
1,2-dibromoethane (Ethylene Dibromide)	**0.0005**		0.00083	I			< 0.00020	<0.0002	< 0.00020	<0.0002	<0.0002	<0.0002	<0.0003	<0.0002	< 0.00020	<0.0002	< 0.00020	<0.0001	<0.0001	< 0.00020
1,2-Dichlorobenzene	**0.2**	0.007	0.0007	FW	0.003	AO	< 0.00050	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	< 0.00050	<0.0005	< 0.00050	<0.0002	<0.0002	< 0.00050
1,3-Dichlorobenzene		1.5	0.15	FW			< 0.00050	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	< 0.00050	<0.0005	< 0.00050	<0.0001	<0.0001	< 0.00050
1,4-Dichlorobenzene	**0.005**	0.26	0.026	FW	0.001	AO	< 0.00050	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	< 0.00050	<0.0005	< 0.00050	<0.0001	<0.0001	< 0.00050
Dichlorodifluoromethane (Freon 12)	**0.8**						< 0.0020	<0.002	< 0.0020	<0.002	<0.002	<0.002	<0.001	-	< 0.0020	<0.002	< 0.0020	<0.0001	<0.0001	< 0.0020
1,1-Dichloroethane	**0.03**		3.1	I			< 0.00050	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	< 0.00050	<0.0005	< 0.00050	<0.0001	<0.0001	< 0.00050
1,2-Dichloroethane	**0.005**	1	0.005	L	0.005		< 0.00050	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	< 0.00050	<0.0005	**0.026**	<0.0004	<0.0004	< 0.00050
1,1-Dichloroethylene	**0.014**		0.68	I	0.014		< 0.00050	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	< 0.00050	<0.0005	< 0.00050	<0.0001	<0.0001	< 0.00050
cis-1,2-Dichloroethylene	**0.008**		0.017	I			< 0.0010	<0.001	< 0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.0010	<0.001	< 0.0010	<0.0001	<0.0001	< 0.0010
trans-1,2-Dichloroethylene	**0.08**		0.017	I			< 0.0010	<0.001	< 0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.0010	<0.001	< 0.0010	<0.0001	<0.0001	< 0.0010
1,2-Dichloropropane	**0.0045**		0.14	I			< 0.00050	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	< 0.00050	<0.0005	0.00055	<0.0001	<0.0001	< 0.00050
cis-1,3-Dichloropropylene	**0.0015**						< 0.0010	<0.001	< 0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.0010	<0.001	< 0.0010	<0.0001	<0.0001	< 0.0010
trans-1,3-Dichloropropylene	**0.0015**						< 0.0010	<0.001	< 0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.0010	<0.001	< 0.0010	<0.0001	<0.0001	< 0.0010
1,1,1,2-Tetrachloroethane	**0.006**		0.028	I			< 0.00050	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	< 0.00050	<0.0005	< 0.00050	-	-	< 0.00050
1,1,2,2-Tetrachloroethane	**0.0008**		0.015	I			< 0.00050	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0005	*<0.001*	<0.0005	< 0.00050	<0.0005	**0.0045**	<0.0002	<0.0002	< 0.00050
Tetrachloroethylene	**0.03**	1.1	0.11	FW	0.03		< 0.00050	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	< 0.00050	<0.0005	< 0.00050	<0.0001	<0.0001	< 0.00050
1,1,1-Trichloroethane	**8**		0.11	FW			< 0.00050	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	< 0.00050	<0.0005	< 0.00050	<0.0001	<0.0001	< 0.00050
1,1,2-Trichloroethane	**0.003**		0.03	I			< 0.00050	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	< 0.00050	<0.0005	< 0.00050	<0.0001	<0.0001	< 0.00050
Trichloroethylene	**0.005**	0.2	0.005	L	0.005		< 0.00050	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	< 0.00050	<0.0005	< 0.00050	<0.0001	<0.0001	< 0.00050
Trichlorofluoromethane (Freon 11)	**1**						< 0.0040	<0.004	< 0.0040	<0.004	<0.004	<0.004	<0.001	<0.004	< 0.0040	<0.004	< 0.0040	<0.0002	<0.0002	< 0.0040
Trihalomethanes (Total)													-							
Vinyl Chloride	**0.002**		0.018	I	0.002		< 0.0010	<0.0005	< 0.0010	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	< 0.00050	<0.0005	< 0.00050	<0.0002	<0.0002	< 0.00050
2-Butanone	**2.5**		150	FW			-	-	-	-	-	-	-	-	-	-	-	<0.005	<0.005	-
2-Hexanone	**0.02**						-	-	-	-	-	-	-	-	-	-	-	<0.02	<0.02	-
4-Methyl-2-pentanone			58	FW			-	-	-	-	-	-	-	-	-	-	-	<0.002	<0.002	-
Freon 113	**100**						< 0.0020	<0.002	< 0.0020	<0.002	<0.002	<0.002	-	-	< 0.0020	<0.002	< 0.0020	-	-	< 0.0020
1,2,3-Trichlorobenzene	**0.003**	0.08					< 0.0020	<0.002	< 0.0020	<0.002	<0.002	<0.002	<0.001	-	< 0.0020	<0.002	< 0.0020	-	-	< 0.0020
1,2,4-Trichlorobenzene	**0.0055**	0.24					< 0.0020	<0.002	< 0.0020	<0.002	<0.002	<0.002	<0.001	-	< 0.0020	<0.002	< 0.0020	-	-	< 0.0020
Hexachlorobutadiene	**0.002**	0.015					< 0.00050	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0005	<0.001	-	< 0.00050	<0.0005	< 0.00050	-	-	< 0.00050

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.
Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied
AO = Aesthetic Objective; OG = Operational Guideline
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
[1] = Sample re-analyzed for dichloromethane was past method-specified hold time. Re-analysis yielded a concentration of <0.002 mg/L

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 20
Results of Groundwater Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19B-09MW-03	K19B-09MW-03	K19B-09MW-04	K19B-09MW-04	K19B-09MW-05	K19B-09MW-05	K19B-09MW-06	K19B-09MW-06	K19B-09MW-07	K19B-09MW-07	K19B-10MW-12	K19B-10MW-13	K19B-10MW-14
Sample Control Number							-	K19B-09MW-03	-	K19B-09MW-04	-	K19B-09MW-05	-	K19B-09MW-06	-	K19B-09MW-07	K19B-10MW-12	K19B-10MW-13	K19B-10MW-14
Laboratory ID							101105151	B650178	101105151	B650178	101105151	B650178	101105151	B650178	101105151	B083804	B650178	B650178	B650178
Date Sampled							4-Nov-09	19-Jun-16	4-Nov-09	19-Jun-16	4-Nov-09	19-Jun-16	4-Nov-09	19-Jun-16	4-Nov-09	9-Sep-10	19-Jun-16	19-Jun-16	19-Jun-16
QA/QC																			
APEC/ AEC																			
Volatile Organic Compounds																			
Acetone	**3.5**		13																
Bromodichloromethane	**0.1**		8.5	FW			<0.0001	< 0.0010	<0.0001	< 0.0010	<0.0001	< 0.0010	<0.0001	< 0.0010	<0.0001	<0.001	< 0.0010	< 0.0010	< 0.0010
Bromomethane	**0.0055**		0.056	I			<0.0008	< 0.0010	<0.0008	< 0.0010	<0.0008	< 0.0010	<0.0008	< 0.0010	<0.0008	<0.001	< 0.0010	< 0.0010	< 0.0010
Dibromomethane							<0.0002	-	<0.0002	-	<0.0002	-	<0.0002	-	<0.0002	-	-	-	-
Bromoform	**0.1**		0.77	I			<0.0002	< 0.0010	<0.0002	< 0.0010	<0.0002	< 0.0010	<0.0002	< 0.0010	<0.0002	<0.001	< 0.0010	< 0.0010	< 0.0010
Carbon Tetrachloride	**0.002**	0.13	0.005	L	0.002		<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	<0.001	< 0.00050	< 0.00050	< 0.00050
Chlorobenzene	**0.08**	0.013	0.0013	FW	0.08	AO	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	<0.0005	< 0.00050	< 0.00050	< 0.00050
Chloroethane							<0.0004	< 0.0010	<0.0004	< 0.0010	<0.0004	< 0.0010	<0.0004	< 0.0010	<0.0004	<0.001	< 0.0010	< 0.0010	< 0.0010
Chloroform	**0.1**	0.02	0.0018	FW			<0.0003	< 0.0010	<0.0003	< 0.0010	<0.0003	< 0.0010	<0.0003	< 0.0010	<0.0003	<0.001	< 0.0010	< 0.0010	< 0.0010
Chloromethane							<0.0004	< 0.0010	<0.0004	< 0.0010	<0.0004	< 0.0010	<0.0004	< 0.0010	<0.0004	<0.001	< 0.0010	< 0.0010	< 0.0010
Dichloromethane	**0.05**	0.98	0.05	L	0.05		<0.006	< 0.0020	<0.006	< 0.0020	<0.006	< 0.0020	<0.006	< 0.0020	<0.006	<0.002	< 0.0020	< 0.0020	< 0.0020
Dibromochloromethane	**0.1**		0.1	L			<0.0001	< 0.0010	<0.0001	< 0.0010	<0.0001	< 0.0010	<0.0001	< 0.0010	<0.0001	<0.001	< 0.0010	< 0.0010	< 0.0010
1,2-dibromoethane (Ethylene Dibromide)	**0.0005**		0.00083	I			<0.0001	< 0.00020	<0.0001	< 0.00020	<0.0001	< 0.00020	<0.0001	< 0.00020	<0.0001	<0.0002	< 0.00020	< 0.00020	< 0.00020
1,2-Dichlorobenzene	**0.2**	0.007	0.0007	FW	0.003	AO	<0.0002	< 0.00050	<0.0002	< 0.00050	<0.0002	< 0.00050	<0.0002	< 0.00050	<0.0002	<0.0005	< 0.00050	< 0.00050	< 0.00050
1,3-Dichlorobenzene		1.5	0.15	FW			<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	<0.0005	< 0.00050	< 0.00050	< 0.00050
1,4-Dichlorobenzene	**0.005**	0.26	0.026	FW	0.001	AO	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	<0.0005	< 0.00050	< 0.00050	< 0.00050
Dichlorodifluoromethane (Freon 12)	**0.8**						<0.0001	< 0.0020	<0.0001	< 0.0020	<0.0001	< 0.0020	<0.0001	< 0.0020	<0.0001	-	< 0.0020	< 0.0020	< 0.0020
1,1-Dichloroethane	**0.03**		3.1	I			<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	<0.0005	< 0.00050	< 0.00050	< 0.00050
1,2-Dichloroethane	**0.005**	1	0.005	L	0.005		<0.0004	< 0.00050	<0.0004	< 0.00050	<0.0004	< 0.00050	<0.0004	< 0.00050	<0.0004	<0.0005	< 0.00050	< 0.00050	< 0.00050
1,1-Dichloroethylene	**0.014**		0.68	I	0.014		<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	<0.0005	< 0.00050	< 0.00050	< 0.00050
cis-1,2-Dichloroethylene	**0.008**		0.017	I			<0.0001	< 0.0010	<0.0001	< 0.0010	<0.0001	< 0.0010	<0.0001	< 0.0010	<0.0001	<0.001	< 0.0010	< 0.0010	< 0.0010
trans-1,2-Dichloroethylene	**0.08**		0.017	I			<0.0001	< 0.0010	<0.0001	< 0.0010	<0.0001	< 0.0010	<0.0001	< 0.0010	<0.0001	<0.001	< 0.0010	< 0.0010	< 0.0010
1,2-Dichloropropane	**0.0045**		0.14	I			<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	<0.0005	< 0.00050	< 0.00050	< 0.00050
cis-1,3-Dichloropropylene	**0.0015**						<0.0001	< 0.0010	<0.0001	< 0.0010	<0.0001	< 0.0010	<0.0001	< 0.0010	<0.0001	<0.001	< 0.0010	< 0.0010	< 0.0010
trans-1,3-Dichloropropylene	**0.0015**						<0.0001	< 0.0010	<0.0001	< 0.0010	<0.0001	< 0.0010	<0.0001	< 0.0010	<0.0001	<0.001	< 0.0010	< 0.0010	< 0.0010
1,1,1,2-Tetrachloroethane	**0.006**		0.028	I			-	< 0.00050	-	< 0.00050	-	< 0.00050	-	< 0.00050	-	<0.0005	< 0.00050	< 0.00050	< 0.00050
1,1,2,2-Tetrachloroethane	**0.0008**		0.015	I			<0.0002	< 0.00050	<0.0002	< 0.00050	<0.0002	< 0.00050	<0.0002	< 0.00050	<0.0002	<0.0005	< 0.00050	< 0.00050	< 0.00050
Tetrachloroethylene	**0.03**	1.1	0.11	FW	0.03		<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	<0.0005	< 0.00050	< 0.00050	< 0.00050
1,1,1-Trichloroethane	**8**		0.11	FW			<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	<0.0005	< 0.00050	< 0.00050	< 0.00050
1,1,2-Trichloroethane	**0.003**		0.03	I			<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	<0.0005	< 0.00050	< 0.00050	< 0.00050
Trichloroethylene	**0.005**	0.2	0.005	L	0.005		<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	< 0.00050	<0.0001	<0.0005	< 0.00050	< 0.00050	< 0.00050
Trichlorofluoromethane (Freon 11)	**1**						<0.0002	< 0.0040	<0.0002	< 0.0040	<0.0002	< 0.0040	<0.0002	< 0.0040	<0.0002	<0.004	< 0.0040	< 0.0040	< 0.0040
Trihalomethanes (Total)																			
Vinyl Chloride	**0.002**		0.018	I	0.002		<0.0002	< 0.00050	<0.0002	< 0.00050	<0.0002	< 0.00050	<0.0002	< 0.00050	<0.0002	<0.0005	< 0.00050	< 0.00050	< 0.00050
2-Butanone	**2.5**		150	FW			<0.005	-	<0.005	-	<0.005	-	<0.005	-	<0.005	-	-	-	-
2-Hexanone	**0.02**						<0.02	-	<0.02	-	<0.02	-	<0.02	-	<0.02	-	-	-	-
4-Methyl-2-pentanone			58	FW			<0.002	-	<0.002	-	<0.002	-	<0.002	-	<0.002	-	-	-	-
Freon 113	**100**						-	< 0.0020	-	< 0.0020	-	< 0.0020	-	< 0.0020	-	-	< 0.0020	< 0.0020	< 0.0020
1,2,3-Trichlorobenzene	**0.003**	0.08					-	< 0.0020	-	< 0.0020	-	< 0.0020	-	< 0.0020	-	-	< 0.0020	< 0.0020	< 0.0020
1,2,4-Trichlorobenzene	**0.0055**	0.24					-	< 0.0020	-	< 0.0020	-	< 0.0020	-	< 0.0020	-	-	< 0.0020	< 0.0020	< 0.0020
Hexachlorobutadiene	**0.002**	0.015					-	< 0.00050	-	< 0.00050	-	< 0.00050	-	< 0.00050	-	-	< 0.00050	< 0.00050	< 0.00050

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.
Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.
B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)
Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.
Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied
AO = Aesthetic Objective; OG = Operational Guideline
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
' = Sample re-analyzed for dichloromethane was past method-specified hold time. Re-analysis yielded a concentration of <0.002 mg/L

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 20
Results of Groundwater Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19B-10MW-15	K19B-10MW-15	K19B-10MW-15	K19B-10MW-18	K19-MW16-01D	K19-MW16-01D	K19-MW16-01D	K19-MW16-03D	K19-MW16-03D	K19-MW16-03D	K19-MW16-03S	K19-MW16-04	K19-MW16-04	K19-MW16-05	K19-MW16-06
Sample Control Number							K19B-10MW-15	MWC	03797-01	K19B-10MW-18	K19-MW16-01D	K19-MW16-01D	06690-06	K19-MW16-03D	K19-MW16-03D	03375-03	K19-MW16-03S	K19-MW16-04	K19-MW16-04	K19-MW16-05	K19-MW16-06
Laboratory ID							B646703	B646703	17N243826	B646703	B619935	B650178	B710365	B620736	B650178	B709734	B650178	B620736	B650178	B650178	B620736
Date Sampled							9-Jun-16	9-Jun-16	26-Jul-17	9-Jun-16	11-Mar-16	17-Jun-16	8-Feb-17	15-Mar-16	17-Jun-16	4-Feb-17	17-Jun-16	15-Mar-16	16-Jun-16	18-Jun-16	14-Mar-16
QA/QC							FDA	FD													
APEC/ AEC							3a, 13, 15	3a, 13, 15	3a, 13, 15												
Volatile Organic Compounds																					
Acetone	**3.5**		13						<0.01												
Bromodichloromethane	**0.1**		8.5	FW			< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Bromomethane	**0.0055**		0.056	I			< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Dibromomethane							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	**0.1**		0.77	I			< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Carbon Tetrachloride	**0.002**	0.13	0.005	L	0.002		< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Chlorobenzene	**0.08**	0.013	0.0013	FW	0.08	AO	< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Chloroethane							< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Chloroform	**0.1**	0.02	0.0018	FW			< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Chloromethane							< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Dichloromethane	**0.05**	0.98	0.05	L	0.05		< 0.0020	< 0.0020	<0.001	< 0.0020	< 0.0020	< 0.0020	<0.002	< 0.0020	< 0.0020	<0.002	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Dibromochloromethane	**0.1**		0.1	L			< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
1,2-dibromoethane (Ethylene Dibromide)	**0.0005**		0.00083	I			< 0.00020	< 0.00020	<0.0003	< 0.00020	< 0.00020	< 0.00020	<0.0002	< 0.00020	< 0.00020	<0.0002	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020
1,2-Dichlorobenzene	**0.2**	0.007	0.0007	FW	0.003	AO	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
1,3-Dichlorobenzene		1.5	0.15	FW			< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
1,4-Dichlorobenzene	**0.005**	0.26	0.026	FW	0.001	AO	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Dichlorodifluoromethane (Freon 12)	**0.8**						< 0.0020	< 0.0020	<0.001	< 0.0020	< 0.0020	< 0.0020	<0.002	< 0.0020	< 0.0020	<0.002	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
1,1-Dichloroethane	**0.03**		3.1	I			< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
1,2-Dichloroethane	**0.005**	1	0.005	L	0.005		< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
1,1-Dichloroethylene	**0.014**		0.68	I	0.014		< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
cis-1,2-Dichloroethylene	**0.008**		0.017	I			< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-1,2-Dichloroethylene	**0.08**		0.017	I			< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
1,2-Dichloropropane	**0.0045**		0.14	I			< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
cis-1,3-Dichloropropylene	**0.0015**						< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
trans-1,3-Dichloropropylene	**0.0015**						< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
1,1,1,2-Tetrachloroethane	**0.006**		0.028	I			< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
1,1,2,2-Tetrachloroethane	**0.0008**		0.015	I			< 0.00050	< 0.00050	*<0.001*	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Tetrachloroethylene	**0.03**	1.1	0.11	FW	0.03		< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
1,1,1-Trichloroethane	**8**		0.11	FW			< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
1,1,2-Trichloroethane	**0.003**		0.03	I			< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Trichloroethylene	**0.005**	0.2	0.005	L	0.005		< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Trichlorofluoromethane (Freon 11)	**1**						< 0.0040	< 0.0040	<0.001	< 0.0040	< 0.0040	< 0.0040	<0.004	< 0.0040	< 0.0040	<0.004	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040
Trihalomethanes (Total)									<0.002												
Vinyl Chloride	**0.002**		0.018	I	0.002		< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
2-Butanone	**2.5**		150	FW			-	-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	**0.02**						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone			58	FW			-	-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-
Freon 113	**100**						< 0.0020	< 0.0020	-	< 0.0020	< 0.0020	< 0.0020	<0.002	< 0.0020	< 0.0020	<0.002	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
1,2,3-Trichlorobenzene	**0.003**	0.08					< 0.0020	< 0.0020	<0.001	< 0.0020	< 0.0020	< 0.0020	<0.002	< 0.0020	< 0.0020	<0.002	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
1,2,4-Trichlorobenzene	**0.0055**	0.24					< 0.0020	< 0.0020	<0.001	< 0.0020	< 0.0020	< 0.0020	<0.002	< 0.0020	< 0.0020	<0.002	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Hexachlorobutadiene	**0.002**	0.015					< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.
Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied
AO = Aesthetic Objective; OG = Operational Guideline
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
[1] = Sample re-analyzed for dichloromethane was past method-specified hold time. Re-analysis yielded a concentration of <0.002 mg/L

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 20
Results of Groundwater Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19-MW16-07D	K19-MW16-07D	K19-MW16-07S	K19-MW16-08	K19-MW16-08	K19-MW16-08	K19-MW16-08	K19-MW16-09	K19-MW16-09	K19-MW16-10D	K19-MW16-10D	K19-MW16-01D	K19-MW16-10S	K19-MW16-10S	K19-MW16-11
Sample Control Number							K19-MW16-07D	K19-MW16-07D	K19-MW16-07S	K19-MW16-08	K19-MW16-08-DUP	K19-MW16-08	MWD	K19-MW16-09	06689-01	K19-MW16-10D	K19-MW16-10D	3809-03	K19-MW16-10S	K19-MW16-10S	K19-MW16-11
Laboratory ID							B620736	B650178	B650178	B620736	B620736	B650178	B650178	B650178	B709775	B620736	B650178	17N238668	B621590	B650178	B621590
Date Sampled							14-Mar-16	18-Jun-16	19-Jun-16	15-Mar-16	15-Mar-16	16-Jun-16	16-Jun-16	18-Jun-16	5-Feb-17	15-Mar-16	17-Jun-16	15-Jul-17	18-Mar-16	17-Jun-16	16-Mar-16
QA/QC										FDA	FD	FDA	FD								
APEC/ AEC																		1c (d-g)			
Volatile Organic Compounds																					
Acetone	**3.5**		13															<0.01			
Bromodichloromethane	**0.1**		8.5	FW			< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010
Bromomethane	**0.0055**		0.056	I			< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0020	< 0.0020	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010
Dibromomethane							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	**0.1**		0.77	I			< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010
Carbon Tetrachloride	**0.002**	0.13	0.005	L	0.002		< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050
Chlorobenzene	**0.08**	0.013	0.0013	FW	0.08	AO	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050
Chloroethane							< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010
Chloroform	**0.1**	0.02	0.0018	FW			< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010
Chloromethane							< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0020	< 0.0020	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010
Dichloromethane	**0.05**	0.98	0.05	L	0.05		< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	<0.002	< 0.0020	< 0.0020	<0.001	< 0.0020	< 0.0020	< 0.0020
Dibromochloromethane	**0.1**		0.1	L			< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010
1,2-dibromoethane (Ethylene Dibromide)	**0.0005**		0.00083	I			< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	<0.0002	< 0.00020	< 0.00020	<0.0003	< 0.00020	< 0.00020	< 0.00020
1,2-Dichlorobenzene	**0.2**	0.007	0.0007	FW	0.003	AO	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050
1,3-Dichlorobenzene		1.5	0.15	FW			< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050
1,4-Dichlorobenzene	**0.005**	0.26	0.026	FW	0.001	AO	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	< 0.00050
Dichlorodifluoromethane (Freon 12)	**0.8**						< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	<0.002	< 0.0020	< 0.0020	<0.001	< 0.0020	< 0.0020	< 0.0020
1,1-Dichloroethane	**0.03**		3.1	I			< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050
1,2-Dichloroethane	**0.005**	1	0.005	L	0.005		< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050
1,1-Dichloroethylene	**0.014**		0.68	I	0.014		< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050
cis-1,2-Dichloroethylene	**0.008**		0.017	I			< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010
trans-1,2-Dichloroethylene	**0.08**		0.017	I			< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010
1,2-Dichloropropane	**0.0045**		0.14	I			< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050
cis-1,3-Dichloropropylene	**0.0015**						< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010
trans-1,3-Dichloropropylene	**0.0015**						< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	<0.001	< 0.0010	< 0.0010	< 0.0010
1,1,1,2-Tetrachloroethane	**0.006**		0.028	I			< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050
1,1,2,2-Tetrachloroethane	**0.0008**		0.015	I			< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	*<0.001*	< 0.00050	< 0.00050	< 0.00050
Tetrachloroethylene	**0.03**	1.1	0.11	FW	0.03		< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050
1,1,1-Trichloroethane	**8**		0.11	FW			< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050
1,1,2-Trichloroethane	**0.003**		0.03	I			< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050
Trichloroethylene	**0.005**	0.2	0.005	L	0.005		< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050
Trichlorofluoromethane (Freon 11)	**1**						< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	<0.004	< 0.0040	< 0.0040	<0.001	< 0.0040	< 0.0040	< 0.0040
Trihalomethanes (Total)																		<0.002			
Vinyl Chloride	**0.002**		0.018	I	0.002		< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.0010	< 0.0010	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050
2-Butanone	**2.5**		150	FW			-	-	-	-	-	-	-	-	-	-	-	<0.01	-	-	-
2-Hexanone	**0.02**						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone			58	FW			-	-	-	-	-	-	-	-	-	-	-	<0.01	-	-	-
Freon 113	**100**						< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	<0.002	< 0.0020	< 0.0020	-	< 0.0020	< 0.0020	< 0.0020
1,2,3-Trichlorobenzene	**0.003**	0.08					< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	<0.002	< 0.0020	< 0.0020	<0.001	< 0.0020	< 0.0020	< 0.0020
1,2,4-Trichlorobenzene	**0.0055**	0.24					< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	<0.002	< 0.0020	< 0.0020	<0.001	< 0.0020	< 0.0020	< 0.0020
Hexachlorobutadiene	**0.002**	0.015					< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	< 0.00050	< 0.00050	<0.001	< 0.00050	< 0.00050	< 0.00050

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.
Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied
AO = Aesthetic Objective; OG = Operational Guideline
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
[1] = Sample re-analyzed for dichloromethane was past method-specified hold time. Re-analysis yielded a concentration of <0.002 mg/L

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 20
Results of Groundwater Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19-MW16-11	K19-MW16-12D	K19-MW16-12D	K19-MW16-12S	K19-MW16-12S	K19-MW16-13	K19-MW16-13	K19-MW16-14	K19-MW16-14	K19-MW16-14	K19-MW16-14	K19-MW16-15	K19-MW16-15	K19-MW17-01D	K19-MW17-01S	K19-MW17-02	K19-MW17-04	K19-MW17-05
Sample Control Number							K19-MW16-11	K19-MW16-12D	K19-MW16-12D	K19-MW16-12S	K19-MW16-12S	K19-MW16-13	K19-MW16-13-DUP	K19-MW16-14	K19-MW16-14	06690-07	3809-01	K19-MW16-15	K19-MW16-15	3809-02	03844-04	03375-05	03765-02	03375-07
Laboratory ID							B650178	B621590	B650178	B621590	B650178	B621590	B621590	B621590	B650178	B710365	17N238668	B621590	B648667	17N238668	17N243343	B709734	17N243343	B709734
Date Sampled							19-Jun-16	16-Mar-16	17-Jun-16	18-Mar-16	17-Jun-16	17-Mar-16 FDA	17-Mar-16 FD	17-Mar-16 1b	16-Jun-16 1b	9-Feb-17 1b	15-Jul-17 1b	17-Mar-16	13-Jun-16	15-Jul-17 1b	23-Jul-17 1b	5-Feb-17	25-Jul-17	5-Feb-17 7b, 23a
QA/QC																								
APEC/ AEC																								
Volatile Organic Compounds																								
Acetone	**3.5**		13														<0.01			<0.01	0.328		<0.01	
Bromodichloromethane	**0.1**		8.5	FW			< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.001	< 0.0010	< 0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
Bromomethane	**0.0055**		0.056	I			< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.001	< 0.0010	< 0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
Dibromomethane							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	**0.1**		0.77	I			< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.001	< 0.0010	< 0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
Carbon Tetrachloride	**0.002**	0.13	0.005	L	0.002		< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Chlorobenzene	**0.08**	0.013	0.0013	FW	0.08	AO	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	< 0.00050	< 0.00050	<0.001	<0.001	<0.0005	<0.001	<0.0005
Chloroethane							< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.001	< 0.0010	< 0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
Chloroform	**0.1**	0.02	0.0018	FW			< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.001	< 0.0010	< 0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
Chloromethane							< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.001	< 0.0010	< 0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
Dichloromethane	**0.05**	0.98	0.05	L	0.05		< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	<0.002	<0.001	< 0.0020	< 0.0020	<0.001	<0.001	<0.002	<0.001	<0.002
Dibromochloromethane	**0.1**		0.1	L			< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.001	< 0.0010	< 0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
1,2-dibromoethane (Ethylene Dibromide)	**0.0005**		0.00083	I			< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	<0.0002	<0.0003	< 0.00020	< 0.00020	<0.0003	<0.0003	<0.0002	<0.0003	<0.0002
1,2-Dichlorobenzene	**0.2**	0.007	0.0007	FW	0.003	AO	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,3-Dichlorobenzene		1.5	0.15	FW			< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,4-Dichlorobenzene	**0.005**	0.26	0.026	FW	0.001	AO	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.0005	< 0.00050	< 0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Dichlorodifluoromethane (Freon 12)	**0.8**						< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	<0.002	<0.001	< 0.0020	< 0.0020	<0.001	<0.001	<0.002	<0.001	<0.002
1,1-Dichloroethane	**0.03**		3.1	I			< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	< 0.00050	< 0.00050	<0.001	<0.001	<0.0005	<0.001	<0.0005
1,2-Dichloroethane	**0.005**	1	0.005	L	0.005		< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	< 0.00050	< 0.00050	<0.001	**0.274**	<0.0005	<0.001	<0.0005
1,1-Dichloroethylene	**0.014**		0.68	I	0.014		< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	< 0.00050	< 0.00050	<0.001	<0.001	<0.0005	<0.001	<0.0005
cis-1,2-Dichloroethylene	**0.008**		0.017	I			< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.001	< 0.0010	< 0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
trans-1,2-Dichloroethylene	**0.08**		0.017	I			< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.001	< 0.0010	< 0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
1,2-Dichloropropane	**0.0045**		0.14	I			< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	< 0.00050	< 0.00050	<0.001	**0.045**	<0.0005	<0.001	<0.0005
cis-1,3-Dichloropropylene	**0.0015**						< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.001	< 0.0010	< 0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
trans-1,3-Dichloropropylene	**0.0015**						< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001	<0.001	< 0.0012	< 0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
1,1,1,2-Tetrachloroethane	**0.006**		0.028	I			< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	< 0.00050	< 0.00050	<0.001	<0.001	<0.0005	<0.001	<0.0005
1,1,2,2-Tetrachloroethane	**0.0008**		0.015	I			< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	*<0.001*	< 0.00050	< 0.00050	*<0.001*	*<0.001*	<0.0005	*<0.001*	<0.0005
Tetrachloroethylene	**0.03**	1.1	0.11	FW	0.03		< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	< 0.00050	< 0.00050	<0.001	<0.001	<0.0005	<0.001	<0.0005
1,1,1-Trichloroethane	**8**		0.11	FW			< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	< 0.00050	< 0.00050	<0.001	<0.001	<0.0005	<0.001	<0.0005
1,1,2-Trichloroethane	**0.003**		0.03	I			< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	< 0.00050	< 0.00050	<0.001	<0.001	<0.0005	<0.001	<0.0005
Trichloroethylene	**0.005**	0.2	0.005	L	0.005		< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	< 0.00050	< 0.00050	<0.001	<0.001	<0.0005	<0.001	<0.0005
Trichlorofluoromethane (Freon 11)	**1**						< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	<0.004	<0.001	< 0.0040	< 0.0040	<0.001	<0.001	<0.004	<0.001	<0.004
Trihalomethanes (Total)																	<0.002			<0.002	<0.002		<0.002	
Vinyl Chloride	**0.002**		0.018	I	0.002		< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	< 0.00050	< 0.00050	<0.001	<0.001	<0.0005	<0.001	<0.0005
2-Butanone	**2.5**		150	FW			-	-	-	-	-	-	-	-	-	-	<0.01	-	-	<0.01	<0.01	-	<0.01	-
2-Hexanone	**0.02**						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone			58	FW			-	-	-	-	-	-	-	-	-	-	<0.01	-	-	<0.01	0.018	-	<0.01	-
Freon 113	**100**						< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	<0.002	-	< 0.0020	< 0.0020	-	-	<0.002	-	<0.002
1,2,3-Trichlorobenzene	**0.003**	0.08					< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	<0.002	<0.001	< 0.0020	< 0.0020	<0.001	<0.001	<0.002	<0.001	<0.002
1,2,4-Trichlorobenzene	**0.0055**	0.24					< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	<0.002	<0.001	< 0.0020	< 0.0020	<0.001	<0.001	<0.002	<0.001	<0.002
Hexachlorobutadiene	**0.002**	0.015					< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005	<0.001	< 0.00050	< 0.00050	<0.001	<0.001	<0.0005	<0.001	<0.0005

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.
Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

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< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
[1] = Sample re-analyzed for dichloromethane was past method-specified hold time. Re-analysis yielded a concentration of <0.002 mg/L

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 20
Results of Groundwater Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19-MW17-05	K19-MW17-06	K19-MW17-06	K19-MW17-07	K19-MW17-07	K19-MW17-10	K19-MW17-11	K19-MW17-11	K19-MW17-12	K19-MW17-13	K19-MW17-13	K19-MW17-13	K19-MW17-17	K19-MW17-18	K19-MW17-19	K19-MW17-20
Sample Control Number							03798-01	06689-06	03815-05	06690-01	03815-02	03765-01	06706-02	03830-01	06690-08	06690-04	06690-05	03830-04	03797-02	03797-03	03765-03	03765-06
Laboratory ID							17N243826	B709775	17N242036	B710365	17N242036	17N243343	B710365	17N240971	B710365	B710365	B710365	17N240971	17N243826	17N243826	17N243343	17N243343
Date Sampled							27-Jul-17	6-Feb-17	20-Jul-17	7-Feb-17	20-Jul-17	25-Jul-17	8-Feb-17	16-Jul-17	9-Feb-17	8-Feb-17	8-Feb-17	16-Jul-17	26-Jul-17	26-Jul-17	25-Jul-17	25-Jul-17
QA/QC																FDA	FD					
APEC/ AEC							7b, 23a	7a, 23a	7a, 23a	2b, 20	2b, 20	7b, 23a	5, 24	5, 24				22	26	24	27	6
Volatile Organic Compounds																						
Acetone	**3.5**		13				<0.01		-		-	<0.01		<0.01				<0.01	<0.01	<0.01	<0.01	<0.01
Bromodichloromethane	**0.1**		8.5	FW			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bromomethane	**0.0055**		0.056	I			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dibromomethane							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	**0.1**		0.77	I			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Carbon Tetrachloride	**0.002**	0.13	0.005	L	0.002		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Chlorobenzene	**0.08**	0.013	0.0013	FW	0.08	AO	<0.001	<0.0005	<0.001	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001
Chloroethane							<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chloroform	**0.1**	0.02	0.0018	FW			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chloromethane							<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dichloromethane	**0.05**	0.98	0.05	L	0.05		<0.001	<0.002	<0.001	<0.002	<0.001	<0.001	<0.002	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Dibromochloromethane	**0.1**		0.1	L			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,2-dibromoethane (Ethylene Dibromide)	**0.0005**		0.00083	I			<0.0003	<0.0002	<0.0003	<0.0002	<0.0003	<0.0003	<0.0002	<0.0003	<0.0002	<0.0002	<0.0002	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
1,2-Dichlorobenzene	**0.2**	0.007	0.0007	FW	0.003	AO	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,3-Dichlorobenzene		1.5	0.15	FW			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,4-Dichlorobenzene	**0.005**	0.26	0.026	FW	0.001	AO	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Dichlorodifluoromethane (Freon 12)	**0.8**						<0.001	<0.002	<0.001	<0.002	<0.001	<0.001	<0.002	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
1,1-Dichloroethane	**0.03**		3.1	I			<0.001	<0.0005	<0.001	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001
1,2-Dichloroethane	**0.005**	1	0.005	L	0.005		<0.001	<0.0005	<0.001	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001
1,1-Dichloroethylene	**0.014**		0.68	I	0.014		<0.001	<0.0005	<0.001	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001
cis-1,2-Dichloroethylene	**0.008**		0.017	I			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
trans-1,2-Dichloroethylene	**0.08**		0.017	I			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,2-Dichloropropane	**0.0045**		0.14	I			<0.001	<0.0005	<0.001	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001
cis-1,3-Dichloropropylene	**0.0015**						<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
trans-1,3-Dichloropropylene	**0.0015**						<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,1,1,2-Tetrachloroethane	**0.006**		0.028	I			<0.001	<0.0005	<0.001	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001
1,1,2,2-Tetrachloroethane	**0.0008**		0.015	I			*<0.001*	<0.0005	*<0.001*	<0.0005	*<0.001*	*<0.001*	<0.0005	*<0.001*	<0.0005	<0.0005	<0.0005	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*
Tetrachloroethylene	**0.03**	1.1	0.11	FW	0.03		<0.001	<0.0005	<0.001	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001
1,1,1-Trichloroethane	**8**		0.11	FW			<0.001	<0.0005	<0.001	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001
1,1,2-Trichloroethane	**0.003**		0.03	I			<0.001	<0.0005	<0.001	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001
Trichloroethylene	**0.005**	0.2	0.005	L	0.005		<0.001	<0.0005	<0.001	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001
Trichlorofluoromethane (Freon 11)	**1**						<0.001	<0.004	<0.001	<0.004	<0.001	<0.001	<0.004	<0.001	<0.004	<0.004	<0.004	<0.001	<0.001	<0.001	<0.001	<0.001
Trihalomethanes (Total)							<0.002		-		-	<0.002		<0.002				<0.002	<0.002	<0.002	<0.002	<0.002
Vinyl Chloride	**0.002**		0.018	I	0.002		<0.001	<0.0005	<0.001	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001
2-Butanone	**2.5**		150	FW			<0.01	-	-	-	-	<0.01	-	<0.01	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01
2-Hexanone	**0.02**						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone			58	FW			<0.01	-	-	-	-	<0.01	-	<0.01	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01
Freon 113	**100**						-	<0.002	-	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-	-	-	-	-
1,2,3-Trichlorobenzene	**0.003**	0.08					<0.001	<0.002	<0.001	<0.002	<0.001	<0.001	<0.002	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
1,2,4-Trichlorobenzene	**0.0055**	0.24					<0.001	<0.002	<0.001	<0.002	<0.001	<0.001	<0.002	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Hexachlorobutadiene	**0.002**	0.015					<0.001	<0.0005	<0.001	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.
Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied
AO = Aesthetic Objective; OG = Operational Guideline
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
[1] = Sample re-analyzed for dichloromethane was past method-specified hold time. Re-analysis yielded a concentration of <0.002 mg/L

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 20
Results of Groundwater Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19-MW17-21	K19-MW17-21	K19-MW17-22	K19-MW17-23	K19-MW17-24	K19-MW17-24	K19-MW17-25	K19-MW17-26	K19-MW17-27	K19-MW17-28	K19-MW17-29D	K19-MW17-29S	K19-MW17-30	K19-MW17-31	K19-MW17-32	K19-MW17-33	K19-MW17-34	K19-MW17-35D	K19-MW17-35D	K19-MW17-35S
Sample Control Number							03765-04	03765-05	03762-04	03762-03	03797-04	03797-05	03797-06	03763-04	03798-02	03798-03	03762-07	03763-05	03762-01	03762-02	03798-04	03762-05	03762-06	03763-01	03763-02	03763-06
Laboratory ID							17N243343	17N243343	17N244304	17N244304	17N243826	17N243826	17N243826	17N244304	17N243826	17N243826	17N244304	17N244304	17N244304	17N244304	17N243826	17N244304	17N244304	17N244304	17N244304	17N244304
Date Sampled							25-Jul-17	25-Jul-17	28-Jul-17	28-Jul-17	26-Jul-17	26-Jul-17	26-Jul-17	30-Jul-17	27-Jul-17	27-Jul-17	28-Jul-17	30-Jul-17	28-Jul-17	29-Jul-17	27-Jul-17	28-Jul-17	28-Jul-17	29-Jul-17	29-Jul-17	30-Jul-17
QA/QC							FDA	FD			FDA	FD												FDA	FD	
APEC/ AEC							21	21	25	18	17	17	16	19	20	4	1b	1b	12	11	1d	14	15	1b	1b	1b
Volatile Organic Compounds																										
Acetone	**3.5**		13				<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.058	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromodichloromethane	**0.1**		8.5	FW			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bromomethane	**0.0055**		0.056	I			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dibromomethane							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	**0.1**		0.77	I			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Carbon Tetrachloride	**0.002**	0.13	0.005	L	0.002		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Chlorobenzene	**0.08**	0.013	0.0013	FW	0.08	AO	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chloroethane							<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chloroform	**0.1**	0.02	0.0018	FW			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chloromethane							<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dichloromethane	**0.05**	0.98	0.05	L	0.05		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dibromochloromethane	**0.1**		0.1	L			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,2-dibromoethane (Ethylene Dibromide)	**0.0005**		0.00083	I			<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
1,2-Dichlorobenzene	**0.2**	0.007	0.0007	FW	0.003	AO	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,3-Dichlorobenzene		1.5	0.15	FW			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,4-Dichlorobenzene	**0.005**	0.26	0.026	FW	0.001	AO	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Dichlorodifluoromethane (Freon 12)	**0.8**						<0.001	<0.001	-	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	-	-	<0.001	-	-	-	-	-
1,1-Dichloroethane	**0.03**		3.1	I			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,2-Dichloroethane	**0.005**	1	0.005	L	0.005		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	**0.121**	**0.122**	0.001
1,1-Dichloroethylene	**0.014**		0.68	I	0.014		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
cis-1,2-Dichloroethylene	**0.008**		0.017	I			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
trans-1,2-Dichloroethylene	**0.08**		0.017	I			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,2-Dichloropropane	**0.0045**		0.14	I			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.002	<0.001
cis-1,3-Dichloropropylene	**0.0015**						<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
trans-1,3-Dichloropropylene	**0.0015**						<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,1,1,2-Tetrachloroethane	**0.006**		0.028	I			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,1,2,2-Tetrachloroethane	**0.0008**		0.015	I			*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*
Tetrachloroethylene	**0.03**	1.1	0.11	FW	0.03		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,1,1-Trichloroethane	**8**		0.11	FW			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,1,2-Trichloroethane	**0.003**		0.03	I			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Trichloroethylene	**0.005**	0.2	0.005	L	0.005		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Trichlorofluoromethane (Freon 11)	**1**						<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Trihalomethanes (Total)							<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Vinyl Chloride	**0.002**		0.018	I	0.002		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
2-Butanone	**2.5**		150	FW			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.019	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2-Hexanone	**0.02**						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone			58	FW			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Freon 113	**100**						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	**0.003**	0.08					<0.001	<0.001	-	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	-	-	<0.001	-	-	-	-	-
1,2,4-Trichlorobenzene	**0.0055**	0.24					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Hexachlorobutadiene	**0.002**	0.015					<0.001	<0.001	-	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	-	-	<0.001	-	-	-	-	-

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.
Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.
B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)
Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.
Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied
AO = Aesthetic Objective; OG = Operational Guideline
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
[1] = Sample re-analyzed for dichloromethane was past method-specified hold time. Re-analysis yielded a concentration of <0.002 mg/L

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 20
Results of Groundwater Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19 DW WELL	K19 DW WELL	K19-Onsite Water Src	Pink MTN Sa1	DRILL WATER
Sample Control Number							DUP-DW-K19	K19 DW WELL	K19-Onsite Water Src	DRILL WATER/PINKMTN/SA1	03605-01
Laboratory ID							B648667	B648667	B619935	B618204	17N244304
Date Sampled							15-Jun-16	15-Jun-16	11-Mar-16	8-Mar-16	27-Jul-17
QA/QC							FD	FDA			
APEC/ AEC											
Volatile Organic Compounds											
Acetone	**3.5**		13								<0.01
Bromodichloromethane	**0.1**		8.5	FW			< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001
Bromomethane	**0.0055**		0.056	I			< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001
Dibromomethane							-	-	-	-	-
Bromoform	**0.1**		0.77	I			< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001
Carbon Tetrachloride	**0.002**	0.13	0.005	L	0.002		< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005
Chlorobenzene	**0.08**	0.013	0.0013	FW	0.08	AO	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.001
Chloroethane							< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001
Chloroform	**0.1**	0.02	0.0018	FW			< 0.0010	< 0.0010	< 0.0010	< 0.0010	0.002
Chloromethane							< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001
Dichloromethane	**0.05**	0.98	0.05	L	0.05		< 0.0020	< 0.0020	< 0.0020	< 0.0020	<0.001
Dibromochloromethane	**0.1**		0.1	L			< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001
1,2-dibromoethane (Ethylene Dibromide)	**0.0005**		0.00083	I			< 0.00020	< 0.00020	< 0.00020	< 0.00020	<0.0003
1,2-Dichlorobenzene	**0.2**	0.007	0.0007	FW	0.003	AO	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005
1,3-Dichlorobenzene		1.5	0.15	FW			< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005
1,4-Dichlorobenzene	**0.005**	0.26	0.026	FW	0.001	AO	< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.0005
Dichlorodifluoromethane (Freon 12)	**0.8**						< 0.0020	< 0.0020	< 0.0020	< 0.0020	-
1,1-Dichloroethane	**0.03**		3.1	I			< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.001
1,2-Dichloroethane	**0.005**	1	0.005	L	0.005		< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.001
1,1-Dichloroethylene	**0.014**		0.68	I	0.014		< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.001
cis-1,2-Dichloroethylene	**0.008**		0.017	I			< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001
trans-1,2-Dichloroethylene	**0.08**		0.017	I			< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001
1,2-Dichloropropane	**0.0045**		0.14	I			< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.001
cis-1,3-Dichloropropylene	**0.0015**						< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001
trans-1,3-Dichloropropylene	**0.0015**						< 0.0010	< 0.0010	< 0.0010	< 0.0010	<0.001
1,1,1,2-Tetrachloroethane	**0.006**		0.028	I			< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.001
1,1,2,2-Tetrachloroethane	**0.0008**		0.015	I			< 0.00050	< 0.00050	< 0.00050	< 0.00050	*<0.001*
Tetrachloroethylene	**0.03**	1.1	0.11	FW	0.03		< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.001
1,1,1-Trichloroethane	**8**		0.11	FW			< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.001
1,1,2-Trichloroethane	**0.003**		0.03	I			< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.001
Trichloroethylene	**0.005**	0.2	0.005	L	0.005		< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.001
Trichlorofluoromethane (Freon 11)	**1**						< 0.0040	< 0.0040	< 0.0040	< 0.0040	<0.001
Trihalomethanes (Total)											0.002
Vinyl Chloride	**0.002**		0.018	I	0.002		< 0.00050	< 0.00050	< 0.00050	< 0.00050	<0.001
2-Butanone	**2.5**		150	FW			-	-	-	-	<0.01
2-Hexanone	**0.02**						-	-	-	-	-
4-Methyl-2-pentanone			58	FW			-	-	-	-	<0.01
Freon 113	**100**						< 0.0020	< 0.0020	< 0.0020	< 0.0020	-
1,2,3-Trichlorobenzene	**0.003**	0.08					< 0.0020	< 0.0020	< 0.0020	< 0.0020	-
1,2,4-Trichlorobenzene	**0.0055**	0.24					< 0.0020	< 0.0020	< 0.0020	< 0.0020	<0.001
Hexachlorobutadiene	**0.002**	0.015					< 0.00050	< 0.00050	< 0.00050	< 0.00050	-

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.
Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied
AO = Aesthetic Objective; OG = Operational Guideline
QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit; (-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient
[1] = Sample re-analyzed for dichloromethane was past method-specified hold time. Re-analysis yielded a concentration of <0.002 mg/L

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 21
Results of Groundwater Analyses - Glycols
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19A-09MW-01	K19A-09MW-01	K19A-09MW-01	K19A-09MW-06	K19A-09MW-09	K19A-10MW-03	K19A-10MW-03	K19A-10MW10	K19A-10MW-19	K19A-10MW-20	K19A-10MW-21	K19A-10MW-24	K19A-10MW-26	K19A-10MW-28
Sample Control Number							K19A-09MW-01	03375-01	03375-02	K19A-09MW-06	K19A-09MW-09	K19A-10MW-03	SAMPLE E	03375-04	K19A-10MW-19	K19A-10MW-20	K19A-10MW-21	06689-04	K19A-10MW-26	K19A-10MW-28
Laboratory ID							B648291	B709734	B709734	B646703	B650178	B650178	B650178	B709734	B648667	B650178	B650178	B709775	B648291	B646703
Date Sampled							10-Jun-16	4-Feb-17	4-Feb-17	7-Jun-16	16-Jun-16	16-Jun-16	16-Jun-16	4-Feb-17	13-Jun-16	16-Jun-16	16-Jun-16	6-Feb-17	11-Jun-16	9-Jun-16
QA/QC								FDA	FD			FDA	FD							FDA
APEC or AEC																				
Glycols																				
Ethylene Glycol	**8**	1920	190	FW			< 3.0	<3.0	<3.0	< 3.0	< 3.0	< 3.0	< 3.0	<3.0	< 3.0	< 3.0	< 3.0	<3.0	< 3.0	< 3.0
Diethylene Glycol							< 5.0	<5.0	<5.0	< 5.0	< 5.0	< 5.0	< 5.0	<5.0	< 5.0	< 5.0	< 5.0	<5.0	< 5.0	< 5.0
Triethylene Glycol	**8**						< *10*	<5.0	<5.0	< *10*	< *10*	< *10*	< *10*	<5.0	< *10*	< *10*	< *10*	<5.0	< *10*	< *10*
Tetraethylene Glycol							< 10	<10	<10	< 10	< 10	< 10	< 10	<10	< 10	< 10	< 10	<10	< 10	< 10
Propylene Glycol	**80**	5000	500	FW			< 10	<10	<10	< 10	< 10	< 10	< 10	<10	< 10	< 10	< 10	<10	< 10	< 10

Notes:

All parameter units in milligrams per litre (mg/L), unless otherwise noted.

Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied

QA/QC = Quality Assurance/Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate

< = Less than the laboratory method detection limit

(-) = Parameter not analyzed

Italics - indicates that the detection limit exceeds one or more criteria.

APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 21
Results of Groundwater Analyses - Glycols
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19A-10MW-28	K19A-10MW-28	K19B-09MW-02	K19B-09MW-02	K19B-09MW-04	K19B-10MW-13	K19B-10MW-15	K19B-10MW-16	K19-MW16-04	K19-MW16-10S	K19-MW16-10D	K19-MW16-11	K19-MW16-12D	K19-MW16-12S
Sample Control Number							MWB	06690-03	K19B-09MW-02	MWF	K19B-09MW-04	K19B-10MW-13	K19B-10MW-15	K19B-10MW-16	K19-MW16-04	3808-02	3808-01	K19-MW16-11	3808-03	3808-04
Laboratory ID							B646703	B710365	B650178	B650178	B650178	B650178	B646703	B646703	B650178	17N238668	17N238668	B650178	17N238668	17N238668
Date Sampled							9-Jun-16	8-Feb-17	19-Jun-16	19-Jun-16	19-Jun-16	19-Jun-16	9-Jun-16	9-Jun-16	16-Jun-16	13-Jul-17	13-Jul-17	19-Jun-16	13-Jul-17	13-Jul-17
QA/QC							FD		FDA	FD			FDA							
APEC or AEC																2b (d-g)	2b (d-g)		K19B (d-g)	K19B (d-g)
Glycols																				
Ethylene Glycol	8	1920	190	FW			< 3.0	<3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	*<10*	*<10*	< 3.0	*<10*	*<10*
Diethylene Glycol							< 5.0	<5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	<5	<5	< 5.0	<5	<5
Triethylene Glycol	8						*< 10*	<5.0	*< 10*	*< 10*	*< 10*	*< 10*	*< 10*	*< 10*	*< 10*	*<10*	*<10*	*< 10*	*<10*	*<10*
Tetraethylene Glycol							< 10	<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	<10	<10	< 10	<10	<10
Propylene Glycol	80	5000	500	FW			< 10	<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	<10	<10	< 10	<10	<10

Notes:

All parameter units in milligrams per litre (mg/L), unless otherwise noted.

Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied

QA/QC = Quality Assurance/Quality Control
FDA = Field Duplicate Available; FD = Field Duplicate
< = Less than the laboratory method detection limit
(-) = Parameter not analyzed
Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 21
Results of Groundwater Analyses - Glycols
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	Notes	K19-MW16-15	K19-MW17-01D	K19-MW17-01S	K19-MW17-11	K19-MW17-12	K19-MW17-13	K19-MW17-25	K19-MW17-30	K19-MW17-31	K19-MW17-33	DRILL WATER
Sample Control Number							K19-MW16-15	3809-02	03844-04	06706-02	06690-08	06690-04	03797-06	03762-01	03762-02	03762-05	03605-01
Laboratory ID							B648667	17N238668	17N243343	B710365	B710365	B710365	17N243826	17N244304	17N244304	17N244304	17N244304
Date Sampled							13-Jun-16	15-Jul-17	23-Jul-17	8-Feb-17	9-Feb-17	8-Feb-17	26-Jul-17	28-Jul-17	29-Jul-17	28-Jul-17	27-Jul-17
QA/QC																	
APEC or AEC								1b	1b				16	12	11	14	
Glycols																	
Ethylene Glycol	**8**	1920	190	FW			< 3.0	*<10*	*<10*	<3.0	<3.0	<3.0	*<10*	*<10*	*<10*	*<10*	*<10*
Diethylene Glycol							< 5.0	<5	<5	<5.0	<5.0	<5.0	<5	<5	<5	<5	<5
Triethylene Glycol	**8**						*< 10*	*<10*	*<10*	<5.0	<5.0	<5.0	*<10*	*<10*	*<10*	*<10*	*<10*
Tetraethylene Glycol							< 10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Propylene Glycol	**80**	5000	500	FW			< 10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

Notes:
All parameter units in milligrams per litre (mg/L), unless otherwise noted.
Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.
B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)
Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied
Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied

QA/QC = Quality Assurance/Quality Control	**2.5**	Exceeds CSR DW standard
FDA = Field Duplicate Available; FD = Field Duplicate	1	Exceeds CSR AW-F standard
< = Less than the laboratory method detection limit	0.1	Exceeds FIGQ AL standard
(-) = Parameter not analyzed	200	Exceeds CDWQ standard

Italics - indicates that the detection limit exceeds one or more criteria.
APEC = area of potential environmental concern; AEC = Area of environmental concern; d-g = down-gradient

Table 22
Results of Groundwater Analyses - Pesticides
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	BC CSR Standards for Drinking Water (Stage 10_3)	BC CSR Standards for Aquatic Life (Fresh Water) (Stage 10_3)	Federal Interim Groundwater Quality Guidelines (AL)	Notes	Health Canada Drinking Water Guidelines	K19A-09MW-01	K19A-09MW-01	K19A-10MW10	K19A-10MW-24	K19-MW16-01D	K19-MW17-11	K19-MW17-13
Sample Control Number						03375-01	03375-02	03375-04	06689-04	06690-06	06706-02	06690-04
Laboratory Report Number						B709734	B709734	B709734	B709775	B710365	B710365	B710365
Date Sampled						4-Feb-17	4-Feb-17	4-Feb-17	6-Feb-17	8-Feb-17	8-Feb-17	8-Feb-17
QA/QC						FDA	FD					
Organic Chlorinated Compounds												
4,4-DDD						<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
4,4-DDE						<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
4,4-DDT						<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Aldrin	**0.000009**		0.003	FW		<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Aldrin + dieldrin		0.00004				<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Dieldrin	**0.00001**		0.000056	FW		<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Chlordane	**0.00045**	0.00006	0.015	FW		<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
alpha-Chlordane						<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Chlordane, technical mixture						<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
alpha-Endosulfan						<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
beta-Endosulfan						<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Endosulfan Sulfate						<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Endosulfan	**0.025**	0.00001	0.00003			<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
DDD, Total						<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
DDE, Total						<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
DDT+ metabolites			0.000001	FW		<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
DDT, Total	**0.00045**	0.00001				<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Heptachlor Epoxide	**0.000015**	0.0001	0.0000038	FW		*<0.000005*	*<0.000005*	*<0.000005*	*<0.000005*	*<0.000005*	*<0.000005*	*<0.000005*
Heptachlor	**0.000035**	0.0001				<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Heptachlor & Heptachlor epoxide						<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Methoxychlor	**0.02**		0.00003	FW		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
o,p'-DDE						<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
o,p'-DDD						<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
o,p'-DDT						<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Oxychlordane						<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005

Notes:

All parameter units in milligrams per litre (mg/L), unless otherwise noted.

Guidelines show are from the Federal Interim Groundwater Quality Guidelines (FIGQ) for Federal Contaminated Sites prepared under the Federal Contaminated Sites Action Plan (November 2012, updated March 2014). The most conservative guidelines for Agricultural Land Use (AL) have been applied for fine-grained sediments.

B.C. Contaminated Sites Regulation standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017). Stage 10 CSR standards are for drinking water (DW) and freshwater aquatic life (AW-F)

Health Canada Guidelines for Canadian Drinking Water Quality (CDWQ) prepared by the Federal-Provincial-Territorial Committee on Health and the Environment (October, 2014) and updated to February 2017. The Maximum Allowable Concentration (MAC) is applied unless otherwise noted.

Most conservative FIGQ Guideline for water use/expose pathways for Freshwater Aquatic Life (FW), Inhalation (I), Irrigation (IG) and Livestock (L) is applied

QA/QC = Quality Assurance/Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate

< = Less than the laboratory method detection limit; (-) = Parameter not analyzed

Italics - indicates that the detection limit exceeds one or more criteria.

2.5	Exceeds CSR DW standard
1	Exceeds CSR AW-F standard
0.1	Exceeds FIGQ AL standard
200	Exceeds CDWQ standard

Table 23
Results of Surface Water Analysis - Dissolved Metals, Anions and Nutrients
K19 Trutch Former Townsite
Alaska Highway, BC

Location							K19-SW17-01	K19-SW17-02	K19-SW17-03	K19-SW17-04	K19-SW17-05	K19-SW17-05	K19-SW17-06	K19-SW17-07	K19 CULVERT	K19-SW17-08	K19-SW17-09	K19-SW17-10
Sample Control Number															K19 CULVERT			
Laboratory Report Number	CCME AW-F Standard[1]	Notes	BCWQG FW Maximum Standard[2]	Notes	BCWQG FW 30 Day Standard[2]	Notes	03814-01 17N240971	03814-02 17N240971	03814-03 17N240971	03814-04 17N240971	03814-05 17N240971	03814-06 17N240971	03814-07 17N240971	03844-01 17N243343	B648667	03844-02 17N243343	03844-03 17N243343	03763-03 17N244304
Date Sampled							7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/23/2017	6/15/2016	7/23/2017	7/23/2017	7/29/2017
QA/QC											FDA	FD						
Wetland							C	C	C	C	D	D	D	Culvert inlet	Culvert outlet	Culvert outlet	Downstream of culvert	Background
Anions and Nutrients																		
Alkalinity, Total as CaCO3							-	-	-	-	-	-	-	-	29.7	-	-	-
Alkalinity, Carbonate (CO3) as CaCO3							-	-	-	-	-	-	-	-	< 0.50	-	-	-
Alkalinity, Bicarbonate (HCO3) as CaCO3							-	-	-	-	-	-	-	-	36.2	-	-	-
Alkalinity, Hydroxide (OH) as CaCO3							-	-	-	-	-	-	-	-	< 0.50	-	-	-
Alkalinity, Phenolphthalein as CaCO3							-	-	-	-	-	-	-	-	< 0.50	-	-	-
Chloride (Cl)	**120**	LT	600		150		0.4	1.03	0.16	<0.05	0.06	0.06	0.06	0.05	1.9	1.24	6.27	<0.05
Fluoride (F)	**0.12**	LT	0.1 - 0.4	H			-	-	-	-	-	-	-	-	0.059	-	-	-
Nitrate (as N)	**13**	LT	32.8		3		-	-	-	-	-	-	-	-	0.022	-	-	-
Nitrite (as N)	**0.06**	LT	0.06 - 0.6	Cl	0.02 - 0.2	Cl	-	-	-	-	-	-	-	-	< 0.0050	-	-	-
Nitrogen, Nitrate-Nitrite							-	-	-	-	-	-	-	-	0.022	-	-	-
Ammonia Nitrogen	**0.021 - 231**	T/pH	0.681 - 28.7	pH/T	0.102 - 2.08	pH/T	-	-	-	-	-	-	-	-	0.043	-	-	-
Phosphate, Ortho							-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon							-	-	-	-	-	-	-	-	-	-	-	-
Field and Physical																		
Dissolved Oxygen, field measured	**<5.5**	LS/T	5 - 9	LS, min	8 - 11	LS, min	**1.61**	**4.22**	**0.52**	**1.71**	6.04	6.04	**2.19**	7.3	9.23	9.83	10.65	**3.09**
Conductivity, field measured							282.3	259.8	322.9	44.4	59.7	59.7	34.5	41.2	62.7	76	122.1	32.7
Oxidation Reduction Potential, field measured							-4.3	-184.9	6	42	-78.9	-78.9	54.2	21.1	39.5	43.3	31.8	69.1
pH, field measured	**6.5 - 9.0**	LT	6.5-9.0		6.5-9.0		7.27	6.93	7.29	**6.12**	**6.07**	**6.07**	**5.74**	**6.34**	7.27	6.81	7.6	**5.86**
Temperature, field measured							13.5	17.1	13.1	11.7	10	10	9.9	8.7	6.3	9.1	9.2	10.6
Hardness, Calcium Carbonate							141	137	137	25.3	22	22	20.6	21.9	32.9	37.1	55.6	15.4
Hardness, Total															34.6			
Salinity							-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Metals																		
Aluminum			0.037 - 0.1	pH	0.014 - 0.05	pH	0.007	0.014	0.009	0.709	0.698	0.608	0.949	0.676	0.457	0.551	1.17	0.819
Antimony							<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	< 0.00050	<0.0002	<0.0002	<0.0002
Arsenic							0.001	0.001	0.0005	0.0007	0.0003	0.0007	0.0007	0.0003	0.00032	0.0004	0.0007	0.0003
Barium							0.293	0.221	0.215	0.0727	0.108	0.0761	0.0926	0.0728	0.0875	0.0876	0.467	0.0799
Beryllium							<0.00001	0.00001	<0.00001	0.00008	0.00007	0.00008	0.00011	0.00005	< 0.00010	0.00004	0.00009	0.00006
Bismuth							<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	< 0.0010	<0.00005	<0.00005	<0.00005
Boron							0.014	0.02	0.019	0.007	0.008	0.008	0.005	0.008	< 0.05	0.01	0.015	0.008
Cadmium			0.000087 - 0.00083	H	0.000053 - 0.000272	H	0.00001	0.00008	0.00001	0.00013	0.00011	0.0001	0.00016	0.00007	0.000065	0.00004	0.0001	0.00009
Calcium							45.5	43.1	44	7.02	6.18	6.18	5.73	6.23	10.1	11.5	15.9	4.29
Chromium							<0.0005	<0.0005	<0.0005	0.001	0.001	0.001	0.0015	0.0006	< 0.0010	0.0006	0.0011	0.0008
Cobalt							0.0003	0.00032	0.00014	0.00121	0.00078	0.00077	0.00222	0.00033	< 0.00050	0.00029	0.00077	0.00064
Copper							0.0019	0.0023	0.0026	0.0042	0.0082	0.0076	0.003	0.0017	0.00231	0.0018	0.0038	0.0018
Iron			0.35				0.149	0.078	0.054	0.942	0.801	0.805	0.969	0.568	0.54	0.484	1.66	0.635
Lead							0.00009	0.0001	0.00006	0.00033	0.00053	0.00049	0.00055	0.00009	< 0.00020	0.00015	0.00209	0.00013
Lithium							0.0022	0.0022	0.0019	0.0027	0.003	0.0028	0.0028	0.0043	< 0.0050	0.004	0.0071	0.0059
Magnesium							6.64	7.24	6.64	1.88	1.6	1.6	1.54	1.55	1.87	2.04	3.87	1.15
Manganese							0.061	0.058	0.007	0.054	0.03	0.03	0.064	0.019	0.0124	0.016	0.047	0.04
Mercury							0.00001	0.00002	0.00002	0.00004	0.00004	0.00004	0.00005	0.00005	< 0.000010	0.00003	0.00003	0.00003
Molybdenum							0.00071	0.00094	0.00187	0.00011	0.00012	0.0001	0.00017	0.00007	< 0.0010	0.00021	0.00019	0.00007
Nickel							0.0019	0.002	0.0017	0.0049	0.0052	0.0051	0.004	0.0042	0.0035	0.0038	0.0045	0.0053
Potassium							2.39	1.76	2.29	0.962	1.14	1.09	0.219	0.39	0.83	0.677	1.03	0.308
Selenium							<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	< 0.00010	<0.0005	<0.0005	<0.0005
Silicon							1.96	1.84	2.07	2.47	2.7	2.6	2.56	2.25	2.7	2.22	3.36	2.4
Silver							<0.00002	0.00003	0.00003	0.00002	0.00004	<0.00002	<0.00002	<0.00002	< 0.000020	<0.00002	<0.00002	<0.00002
Sodium							1.22	1.84	0.583	0.622	0.567	0.551	0.547	0.875	1.5	1.57	4.67	0.966
Strontium							0.104	0.0894	0.0891	0.0232	0.0206	0.019	0.0192	0.0228	0.0249	0.0287	0.0665	0.0179
Sulphur (S)							1.62	0.695	1.87	0.985	0.879	0.926	0.738	<0.5	< 3.0	0.633	0.853	<0.5
Thallium							<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	< 0.000050	<0.00001	<0.00001	<0.00001
Tin							<0.00005	0.00016	<0.00005	<0.00005	0.00016	0.00007	0.00016	<0.00005	< 0.0050	<0.00005	<0.00005	<0.00005
Titanium							0.0012	0.0013	0.0012	0.0042	0.0075	0.0049	0.0108	0.003	0.0053	0.0026	0.007	0.0024
Uranium							0.00028	0.00007	0.00023	0.00019	0.00019	0.0002	0.00028	0.00008	0.0001	0.00013	0.0002	0.0001
Vanadium							<0.0005	0.0005	<0.0005	0.0013	0.0012	0.0009	0.0019	0.0007	< 0.0050	0.0007	0.0019	0.0006
Zinc							0.003	0.009	<0.002	0.008	0.008	0.006	0.007	0.008	0.0105	0.006	0.012	0.012
Zirconium							0.0002	0.0002	0.0002	0.0016	0.002	0.0019	0.0017	0.0011	0.00054	0.0009	0.0013	0.0015

Notes:

[1]Standards are from Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines for the Protection of Aquatic Life

[2]Standards are from the British Columbia Ministry of Environment British Columbia Approved Water Quality Guidelines (BCWQG): Aquatic Life, Wildlife & Agriculture Summary Report, updated January 2017

All parameter units in milligrams per litre (mg/L), unless otherwise noted

AW-F = Freshwater Aquatic Life; FW = Freshwater; Cl = Chloride dependant; LS = Life stage; LT = Long term

pH = pH-dependant; H = Hardness-dependant

V= Standard is valence dependent VI refers to chromium [VI] and III refers to chromium [III]

QA/QC = Quality Assurance/Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

< = Less than the detection limit indicated

*Assuming MeHg ≤ 0.5% of total Hg

2	Sample concentration exceeds CCME Freshwater Aquatic Life Standard
2	Sample concentration exceeds BCWQG Freshwater Aquatic Life Maximium Guideline
2	Sample concentration exceeds BCWQG Freshwater Aquatic Life Long Term Exposure Guideline

Table 24
Results of Surface Water Analysis - Total Metals
K19 Trutch Former Townsite
Alaska Highway, BC

Location							K19-SW17-01	K19-SW17-02	K19-SW17-03	K19-SW17-04	K19-SW17-05	K19-SW17-05	K19-SW17-06	K19-SW17-07	K19 CULVERT	K19-SW17-08	K19-SW17-09	K19-SW17-10
Sample Control Number															K19 CULVERT			
Laboratory Report Number	CCME AW-F Standard[1]	Notes	BCWQG FW Maximum Standard[2]	Notes	BCWQG FW 30 Day Standard[2]	Notes	03814-01	03814-02	03814-03	03814-04	03814-05	03814-06	03814-07	03844-01	B648667	03844-02	03844-03	03763-03
Date Sampled							17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N243343	6/15/2016	17N243343	17N243343	17N244304
QA/QC							7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/19/2017 FDA	7/19/2017 FD	7/19/2017	7/23/2017		7/23/2017	7/23/2017	7/29/2017
Wetland							C	C	C	C	D	D	D	Culvert inlet	Culvert outlet	Culvert outlet	Downstream of culvert	Background
Field and Physical																		
Dissolved Oxygen, field measured	**<5.5**	LS/T	5 - 9	LS, min	8 - 11	LS, min	**1.61**	**4.22**	**0.52**	**1.71**	6.04	6.04	**2.19**	7.3	9.23	9.83	10.65	**3.09**
Conductivity, field measured							282.3	259.8	322.9	44.4	59.7	59.7	34.5	41.2	62.7	76	122.1	32.7
Oxidation Reduction Potential, field measured							-4.3	-184.9	6	42	-78.9	-78.9	54.2	21.1	39.5	43.3	31.8	69.1
pH, field measured	**6.5 - 9.0**	LT	6.5-9.0		6.5-9.0		7.27	6.93	7.29	**6.12**	**6.07**	**6.07**	**5.74**	**6.34**	7.27	6.81	7.6	**5.86**
Temperature, field measured							13.5	17.1	13.1	11.7	10	10	9.9	8.7	6.3	9.1	9.2	10.6
Hardness, Calcium Carbonate							141	137	137	25.3	22	22	20.6	21.9	32.9	37.1	55.6	15.4
Hardness, Total															34.6			
Salinity							-	-	-	-	-	-	-	-	-	-	-	-
Total Metals																		
Aluminum	**0.005 - 0.1**	pH/LT					**0.107**	**2.19**	**1.45**	**1.35**	**2.24**	**2.08**	**1.56**	**0.829**	**0.633**	**4.02**	**4.29**	**1.02**
Antimony					0.009	W	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0005
Arsenic	**0.005**	LT			0.005		0.0008	0.0016	0.0013	0.0007	0.0009	0.0009	0.0006	0.0004	0.00044	0.0019	0.0022	0.0004
Barium					0.001	W	0.324	0.312	0.383	0.0943	0.112	0.108	0.0949	0.0881	0.0938	0.228	0.663	0.089
Beryllium					0.00013	W	<0.00005	0.00012	0.00008	0.00009	0.00013	0.00013	0.00015	0.00007	< 0.00010	0.00027	0.0003	0.00007
Bismuth							-	-	-	-	-	-	-	-	< 0.0010	-	-	-
Boron	**1.5**	LT			1.2		0.017	0.026	0.032	0.011	0.012	0.013	0.009	0.009	< 0.05	0.017	0.023	0.008
Cadmium	**0.00009**	LT					0.00001	**0.00018**	0.00005	**0.00012**	**0.00014**	**0.00013**	**0.00014**	0.00006	0.000066	**0.00014**	**0.00014**	0.00008
Calcium							45	43.3	54.2	6.84	6.83	6.83	7.5	6.49	10.5	13.7	16.6	4.11
Chromium	**0.001[VI], 0.0089[III]**	V			0.001[VI], 0.0089[III]	W	<0.0005	**0.0028**	**0.0018**	**0.0018**	**0.0028**	**0.0026**	**0.0016**	0.0009	< 0.0010	**0.0061**	**0.0069**	0.001
Cobalt			0.11		0.004		0.00038	0.00134	0.00091	0.001	0.00129	0.0013	0.00333	0.00045	< 0.00050	0.00231	0.00269	0.00064
Copper	**0.002 - 0.004**	H/LT	0.00345 - 0.0153	H	0.002 - 0.00564	H	0.0031	**0.0066**	**0.0066**	**0.0071**	**0.0082**	**0.0119**	**0.0034**	**0.0024**	**0.00312**	**0.0083**	**0.009**	0.0017
Iron	**0.3**	LT			1		**0.334**	**2.47**	**1.97**	**1.42**	**1.99**	**1.79**	**0.987**	**0.67**	**0.704**	**5.8**	**6.96**	**0.725**
Lead	**0.001 - 0.0049**	H/LT	0.003 - 0.33	H	0.004 - 0.016	H	0.00023	0.00185	0.00167	**0.00108**	**0.00115**	**0.00111**	0.0007	0.00015	0.0003	**0.00514**	**0.0052**	0.00013
Lithium							0.0024	0.0045	0.0034	0.0035	0.0039	0.0042	0.0031	0.005	< 0.0050	0.0074	**0.0116**	0.0061
Magnesium							6.56	7.44	7.48	1.84	1.91	1.86	2.03	1.61	2.07	2.91	4.5	1.21
Manganese			0.67 - 1.22	H	0.71 - 2.1	H	0.072	0.113	0.061	0.033	0.042	0.04	0.079	0.022	0.0196	0.068	0.092	0.041
Mercury	**0.000026**	LT			0.00002 *	MeHg	0.00001	0.00002	<0.00001	**0.00004**	**0.00004**	0.00002	**0.00005**	**0.00004**	< 0.000010	**0.00005**	**0.00005**	**0.00003**
Molybdenum	**0.073**	LT	2		1		0.0007	0.0011	0.0019	0.0001	0.0002	0.0002	0.0002	0.0001	< 0.0010	0.0005	0.0006	<0.0001
Nickel	**0.025 - 0.15**	H/LT			0.025 - 0.11	W/H	0.0019	0.0051	0.0044	0.006	0.0072	0.0066	0.0062	0.0045	0.0035	0.0101	0.0105	0.0051
Potassium							2.4	3.35	2.99	1.06	1.41	1.39	0.288	0.411	0.91	1.69	1.92	0.358
Selenium	**0.001**	LT			0.001		<0.0005	<0.0005	<0.0005	<0.0005	0.0007	0.0007	0.0007	<0.0005	0.00016	<0.0005	<0.0005	<0.0005
Silicon							-	-	-	-	-	-	-	-	3.1	-	-	-
Silver	**0.00025**	LT	0.0001 - 0.003	H	0.00005 - 0.0015	H	<0.00002	0.00014	<0.00002	<0.00002	0.00003	0.00003	<0.00002	<0.00002	< 0.000020	0.00003	0.00004	<0.00002
Sodium							1.27	2.38	0.712	0.614	0.643	0.671	0.688	0.875	1.45	1.63	4.65	1.15
Strontium							-	-	-	-	-	-	-	-	0.0286	-	-	-
Sulphur (S)							-	-	-	-	-	-	-	-	< 3.0	-	-	-
Thallium	**0.0008**	LT			0.0008	W	<0.00002	0.00005	0.00003	<0.00002	0.00003	0.00003	<0.00002	<0.00002	< 0.000050	0.00008	0.00009	<0.00002
Tin							-	-	-	-	-	-	-	-	< 0.0050	-	-	-
Titanium							0.002	0.018	0.012	0.007	0.012	0.013	0.006	0.008	0.0125	0.031	0.031	0.006
Uranium	**0.015**	LT			0.0085	W	0.00029	0.00016	0.00052	0.00023	0.00028	0.00026	0.00039	0.00009	0.00012	0.0003	0.00033	0.00011
Vanadium							0.001	0.007	0.005	0.003	0.005	0.005	0.003	0.001	< 0.0050	0.014	0.016	0.001
Zinc	**0.03**	LT	0.033 - 0.0713	H	0.0075 - 0.0458	H	<0.005	0.033	0.013	0.009	0.012	0.016	0.007	0.01	0.0112	**0.036**	**0.04**	0.011
Zirconium							-	-	-	-	-	-	-	-	0.00082	-	-	-

Notes:

[1]Standards are from Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines for the Protection of Aquatic Life

[2]Standards are from the British Columbia Ministry of Environment British Columbia Approved Water Quality Guidelines (BCWQG): Aquatic Life, Wildlife & Agriculture Summary Report, updated January 2017

All parameter units in milligrams per litre (mg/L), unless otherwise noted.

AW-F = Freshwater Aquatic Life; FW = Freshwater; Cl = Chloride dependant; LS = Life stage; LT = Long term

pH = pH-dependant; H = Hardness-dependant; W = Working BCWQG

V= Standard is valence dependent VI refers to chromium [VI] and III refers to chromium [III]

QA/QC = Quality Assurance/Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

< = Less than the detection limit indicated

*Assuming MeHg ≤ 0.5% of total Hg

2	Sample concentration exceeds CCME Freshwater Aquatic Life Standard
2	Sample concentration exceeds BCWQG Freshwater Aquatic Life Maximium Guideline
2	Sample concentration exceeds BCWQG Freshwater Aquatic Life Long Term Exposure Guideline

Table 25
Results of Surface Water Analysis - Petroleum Hydrocarbons and PAHs
K19 Trutch Former Townsite
Alaska Highway, BC

Location					K19-SW17-01	K19-SW17-02	K19-SW17-03	K19-SW17-04	K19-SW17-05	K19-SW17-05	K19-SW17-06	K19-SW17-07	K19 CULVERT	K19-SW17-08	K19-SW17-09	K19-SW17-10
Sample Control Number					03814-01	03814-02	03814-03	03814-04	03814-05	03814-06	03814-07	03844-01	K19 CULVERT	03844-02	03844-03	03763-03
Laboratory Report Number					17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N243343	B648667	17N243343	17N243343	17N244304
Date Sampled					7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/23/2017	6/15/2016	7/23/2017	7/23/2017	7/29/2017
QA/QC									FDA	FD						
Wetland					C	C	C	C	D	D	D	Culvert inlet	Culvert outlet	Culvert outlet	Downstream of culvert	Background
Polycyclic Aromatic Hydrocarbons																
Acenaphthene	**0.0058**		0.006		<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	< 0.000050	<0.00002	<0.00002	<0.00002
Acenaphthylene					<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	< 0.000050	<0.00002	<0.00002	<0.00002
Acridine	**0.0044**		0.003		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	< 0.000050	<0.00005	<0.00005	<0.00005
Anthracene	**0.000012**		0.004		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	< 0.000010	<0.00001	<0.00001	<0.00001
Benzo(a)anthracene	**0.000018**		0.0001		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	< 0.000010	<0.00001	<0.00001	<0.00001
Benzo(a)pyrene	**0.000015**		0.00001		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	< 0.0000090	<0.00001	<0.00001	<0.00001
Benzo(b)fluoranthene					<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	-	<0.00001	<0.00001	<0.00001
Benzo[j]fluoranthene					<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	-	<0.00001	<0.00001	<0.00001
Benzo(g,h,i)perylene					<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	< 0.000050	<0.00001	<0.00001	<0.00001
Benzo(k)fluoranthene					<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	< 0.000050	<0.00001	<0.00001	<0.00001
Chrysene					<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	< 0.000050	<0.00001	<0.00001	<0.00001
Dibenzo(a,h)anthracene					<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	< 0.000050	<0.00001	<0.00001	<0.00001
Fluoranthene	**0.00004**		0.004		<0.00002	<0.00002	0.00002	0.00003	0.00002	0.00003	<0.00002	<0.00002	< 0.000020	0.00002	<0.00002	<0.00002
Benzo(b,j) fluoranthene					<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	< 0.000050	<0.00001	<0.00001	<0.00001
Fluorene	**0.003**		0.012		<0.00002	<0.00002	<0.00002	<0.00002	0.00002	0.00002	<0.00002	<0.00002	< 0.000050	<0.00002	<0.00002	<0.00002
Indeno(1,2,3-c,d)pyrene					<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	< 0.000050	<0.00001	<0.00001	<0.00001
Naphthalene	**0.0011**		0.001		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	< 0.00010	<0.00005	<0.00005	<0.00005
Phenanthrene	**0.0004**		0.0003		<0.00004	<0.00004	0.00013	0.00015	0.00014	0.00018	0.00007	0.00005	< 0.000050	0.00007	0.00004	<0.00004
Pyrene	**0.000025**				<0.00002	<0.00002	0.00002	0.00002	<0.00002	0.00002	<0.00002	<0.00002	< 0.000020	0.00002	<0.00002	<0.00002
Quinoline	**0.0034**		0.0034	W	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00024	<0.0001	<0.0001	<0.0001
2-methylnaphthalene					<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	< 0.00010	<0.00005	<0.00005	<0.00005
1-Methylnaphthalene					<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	-	<0.00005	<0.00005	<0.00005
PAH, Low Molecular Weight					-	-	-	-	-	-	-	-	< 0.00024	-	-	-
PAH, High Molecular Weight					-	-	-	-	-	-	-	-	< 0.000050	-	-	-
PAH, Total					-	-	-	-	-	-	-	-	< 0.00024	-	-	-
Hydrocarbons																
EPH (C10-C19)					<0.1	<0.1	0.11	<0.1	<0.1	<0.1	<0.1	<0.1	< 0.20	<0.1	<0.1	<0.1
LEPH					<0.1	<0.1	0.11	<0.1	<0.1	<0.1	<0.1	<0.1	< 0.20	<0.1	<0.1	<0.1
EPH (C19-C32)					0.13	0.20	0.29	0.17	0.17	0.18	0.17	<0.1	< 0.20	0.12	0.11	<0.1
LEPH					0.13	0.20	0.29	0.17	0.17	0.18	0.17	<0.1	< 0.20	0.12	0.11	<0.1
VPH (C6-C10)					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	< 0.3	<0.1	<0.1	<0.1
VH_{w6-10}					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	< 0.3	<0.1	<0.1	<0.1
VPH_{w}					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	< 0.3	<0.1	<0.1	<0.1
F1 (C6-C10)					<0.1	-	-	-	<0.1	<0.1	-	-	-	-	-	<0.1
F2 (C10-C16)					<0.1	-	-	-	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	<0.1
F3 (C16-C34)					0.17	-	-	-	0.25	0.24	-	0.1	-	0.17	0.15	<0.1
F4 (C34-C50)					0.11	-	-	-	<0.1	<0.1	-	<0.1	-	0.1	0.11	<0.1

Notes:

[1]Standards are from Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines for the Protection of Aquatic Life

[2]Standards are from the British Columbia Ministry of Environment British Columbia Approved Water Quality Guidelines (BCWQQ): Aquatic Life, Wildlife & Agriculture Summary Report, updated March 2016

All parameter units in milligrams per litre (mg/L), unless otherwise noted

AW-F = Freshwater Aquatic Life; FW = Freshwater; W = Working BCWQG

QA/QC = Quality Assurance/Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

< = Less than the detection limit indicated

2	Sample concentration exceeds CCME Freshwater Aquatic Life Standarc
2	Sample concentration exceeds BCWQG Freshwater Aquatic Life Maximium Guideline
2	Sample concentration exceeds BCWQG Freshwater Aquatic Life Long Term Exposure Guideline

Table 26
Results of Surface Water Analysis - Volatile Organic Compounds
K19 Trutch Former Townsite
Alaska Highway, BC

Location	CCME AW-F Standard[1]	BCWQG FW Maximum Standard[2]	BCWQG FW 30 Day Standard[2]	Notes	K19-SW17-01	K19-SW17-02	K19-SW17-03	K19-SW17-04	K19-SW17-05	K19-SW17-05	K19-SW17-06	K19-SW17-07	K19 CULVERT	K19-SW17-08	K19-SW17-09	K19-SW17-10
Sample Control Number					03814-01	03814-02	03814-03	03814-04	03814-05	03814-06	03814-07	03844-01	K19 CULVERT	03844-02	03844-03	03763-03
Laboratory Report Number					17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N243343	B648667	17N243343	17N243343	17N244304
Date Sampled					19-Jul-17	19-Jul-17	19-Jul-17	19-Jul-17	19-Jul-17	19-Jul-17	19-Jul-17	23-Jul-17	15-Jun-16	23-Jul-17	23-Jul-17	29-Jul-17
QA/QC									FDA	FD						
Wetland					C	C	C	C	D	D	D	Culvert inlet	Culvert outlet	Culvert outlet	Downstream of culvert	Background
Volatile Organic Compounds																
Acetone					<0.01	-	-	-	<0.01	<0.01	-	<0.01	-	<0.01	<0.01	<0.01
Bromodichloromethane (BDCM)					<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.0010	<0.001	<0.001	<0.001
Bromomethane (Methyl Bromide)					<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.0010	<0.001	<0.001	<0.001
Bromoform (Tribromomethane)					<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.0010	<0.001	<0.001	<0.001
Carbon Tetrachloride	**0.0133**		0.0133	W	<0.0005	-	-	-	<0.0005	<0.0005	-	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0005
Chlorobenzene	**0.0013**				<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.00050	<0.001	<0.001	<0.001
Chloroethane					<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.0010	<0.001	<0.001	<0.001
Chloroform	**0.0018**				<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.0010	<0.001	<0.001	<0.001
Chloromethane					<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.0010	<0.001	<0.001	<0.001
Dichloromethane (DCM) (Methylene Chloride)			0.0981	W	<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.0020	<0.001	<0.001	<0.001
Dibromochloromethane (DBCM)					<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.0010	<0.001	<0.001	<0.001
1,2-dibromoethane (Ethylene Dibromide) (EDB)					<0.0003	-	-	-	<0.0003	<0.0003	-	<0.0003	< 0.00020	<0.0003	<0.0003	<0.0003
1,2-dichlorobenzene	**0.0007**		0.0007	W	<0.0005	-	-	-	<0.0005	<0.0005	-	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0005
1,3-dichlorobenzene	**0.15**		0.15	W	<0.0005	-	-	-	<0.0005	<0.0005	-	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0005
1,4-dichlorobenzene	**0.026**		0.0026	W	<0.0005	-	-	-	<0.0005	<0.0005	-	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0005
Dichlorodifluoromethane (Freon 12)					<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.0020	<0.001	<0.001	-
1,1-dichloroethane					<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.00050	<0.001	<0.001	<0.001
1,2-dichloroethane	**0.1**		0.1	W	<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.00050	<0.001	<0.001	<0.001
1,1-dichloroethene					<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.00050	<0.001	<0.001	<0.001
1,2-dichloroethylene (cis) (1,2-dichloroethene) (cis)					<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.0010	<0.001	<0.001	<0.001
1,2-dichloroethylene (trans) (1,2-dichloroethene) (trans)					<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.0010	<0.001	<0.001	<0.001
1,2-dichloropropane (Propylene Dichloride)					<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.00050	<0.001	<0.001	<0.001
1,3-dichloropropene (cis)					<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.0010	<0.001	<0.001	<0.001
1,3-dichloropropene (trans)					<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.0010	<0.001	<0.001	<0.001
1,1,1,2-tetrachloroethane					<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.00050	<0.001	<0.001	<0.001
1,1,2,2-tetrachloroethane			0.11	W	<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.00050	<0.001	<0.001	<0.001
Tetrachloroethylene (PCE/PERC)	**0.11**				<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.00050	<0.001	<0.001	<0.001
1,1,1-trichloroethane					<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.00050	<0.001	<0.001	<0.001
1,1,2-trichloroethane			0.021	W	<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.00050	<0.001	<0.001	<0.001
Trichloroethylene (TCE)	**0.021**				<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.00050	<0.001	<0.001	<0.001
Trichlorofluoromethane (Freon 11)					<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.0040	<0.001	<0.001	<0.001
Trihalomethanes (Total)					<0.002	-	-	-	<0.002	<0.002	-	<0.002		<0.002	<0.002	<0.002
Vinyl Chloride (Chloroethene)					<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.00050	<0.001	<0.001	<0.001
Benzene	**0.37**		0.04		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	< 0.00040	<0.0005	<0.0005	<0.0005
Ethylbenzene	**0.09**		0.20		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	< 0.00040	<0.0005	<0.0005	<0.0005
Toluene	**0.002**		0.0005		<0.0005	0.0008	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	< 0.00040	<0.0005	<0.0005	<0.0005
Xylenes, Total			0.03		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.00040	<0.001	<0.001	<0.001
o-Xylene					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	< 0.00040	<0.0005	<0.0005	<0.0005
m,p-Xylenes					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	< 0.00040	<0.0005	<0.0005	<0.0005
Methyl tert-Butyl Ether	**10**	3.4			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.0040	<0.001	<0.001	<0.001
Styrene	**0.072**		0.072	W	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	< 0.00050	<0.0005	<0.0005	<0.0005
1,2,4-Trichlorobenzene	**0.024**		0.024	W	<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.0020	<0.001	<0.001	<0.001
1,2,3-Trichlorobenzene	**0.008**		0.008	W	<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.0020	<0.001	<0.001	-
Hexachlorobutadiene	**0.013**		0.013	W	<0.001	-	-	-	<0.001	<0.001	-	<0.001	< 0.00050	<0.001	<0.001	-
2-Butanone					<0.01	-	-	-	<0.01	<0.01	-	<0.01		<0.01	<0.01	<0.01
4-Methyl-2-pentanone					<0.01	-	-	-	<0.01	<0.01	-	<0.01		<0.01	<0.01	<0.01

Notes:

[1]Standards are from Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines for the Protection of Aquatic Life

[2]Standards are from the British Columbia Ministry of Environment British Columbia Approved Water Quality Guidelines (BCWQG): Aquatic Life, Wildlife & Agriculture Summary Report, updated March 2016

All parameter units in milligrams per litre (mg/L), unless otherwise noted.

W = Working BCWQG

QA/QC = Quality Assurance/Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

< = Less than the detection limit indicated

2 Sample concentration exceeds CCME Freshwater Aquatic Life Standard

2 Sample concentration exceeds BCWQG Freshwater Aquatic Life Maximium Guideline

2 Sample concentration exceeds BCWQG Freshwater Aquatic Life Long Term Exposure Guideline

Table 27
Results of Surface Water Analysis - Glycol Parameters
K19 Trutch Former Townsite
Alaska Highway, BC

Location						K19-SW17-01	K19-SW17-05	K19-SW17-05	K19-SW17-07	K19-SW17-08	K19-SW17-10
Sample Control Number	**CCME AW-F Standard[1]**	Notes	BCWQG FW Maximum Standard[2]	Notes	BCWQG FW 30 Day Standard[2]	Notes	03814-01	03814-05	03814-06	03844-01	03844-02	03763-03
Laboratory Report Number							17N240971	17N240971	17N240971	17N243343	17N243343	17N244304
Date Sampled							7/19/2017	7/19/2017	7/19/2017	7/23/2017	7/23/2017	7/29/2017
QA/QC								FDA	FD			
Wetland							C	D	D	Culvert inlet	Culvert outlet	Background
Glycols												
Ethylene Glycol	**192**		192	W			<10	<10	<10	<10	<10	<10
Diethylene Glyco							<5	<5	<5	<5	<5	<5
Triethylene Glyco							<10	<10	<10	<10	<10	<10
Tetraethylene Glycol							<10	<10	<10	<10	<10	<10
Propylene Glycol	**500**		500	W			<10	<10	<10	<10	<10	<10

Notes:

[1]Standards are from Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines for the Protection of Aquatic Life

[2]Standards are from the British Columbia Ministry of Environment British Columbia Approved Water Quality Guidelines (BCWQG): Aquatic Life, Wildlife & Agriculture

All parameter units in milligrams per litre (mg/L), unless otherwise noted.

W = Working BCWQG

QA/QC = Quality Assurance/Quality Control

FDA = Field Duplicate Available; FD = Field Duplicate.

< = Less than the detection limit indicated

2	Sample concentration exceeds CCME Freshwater Aquatic Life Standard
2	Sample concentration exceeds BCWQG Freshwater Aquatic Life Maximium Guideline
2	Sample concentration exceeds BCWQG Freshwater Aquatic Life Long Term Exposure Guideline

Table 28
Results of Sediment Analyses - Metals and Inorganics
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	CCME Interim Sediment Quality Guidelines (ISQG) Freshwater [1]	CCME Probable Effect Levels (PEL) Freshwater [2]	Stage 10 Amendments to CSR Freshwater Sediment Standard for Sensitive Use [3]	Stage 10 Amendments to CSR Freshwater Sediment Standard for Typical Use [4]	K19-SS17-01	K19-SS17-02	K19-SS17-03	K19-SS17-04	K19-SS17-05	K19-SS17-05	K19-SS17-06	K19-SS17-07	K19-SS17-08
Sample Control Number					03813-01	03813-02	03813-03	03813-04	03813-05	03813-06	03813-07	03813-08	03813-09
Laboratory Report Number					17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971
Sample Date					7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017
Sample Depth (m bgs)					0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
QA/QC									FDA	FD			
Physical Parameters													
pH					7.22	7.68	7.58	5.51	5.28	5.42	5.24	5.62	5.32
Inorganics													
Total Organic Carbon (%)					5.37	-	5	-	21.9	14.5	-	1.23	-
Chloride (ion)					6	-	5	-	12	6	-	< 2	-
Sodium (ion)					4	-	4	-	5	2	-	< 2	-
Metals													
Aluminum					11100	12600	12500	15100	18300	21300	7400	15200	14200
Antimony					0.7	0.5	0.8	0.6	0.4	0.5	0.5	0.6	0.5
Arsenic	5.9	17	**11**	20	6.9	8.4	10.9	9.7	4.7	6.3	4.9	8.4	8.2
Barium					246	326	527	377	640	591	423	341	302
Beryllium					0.5	0.5	0.8	0.8	1	1	0.6	0.8	0.7
Bismuth					< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Cadmium	0.6	3.5	**2.2**	4.2	0.47	0.36	0.53	0.64	0.65	0.72	0.69	0.22	0.2
Calcium					11500	11400	8640	4420	10900	11600	2420	3750	2760
Chromium	37.3	90	**56**	110	15	15	23	23	25	24	19	24	23
Cobalt					6.1	6.6	9.9	6.7	5.7	8.3	5.5	9.8	6.5
Copper	35.7	197	**120**	240	17.7	16.8	28.6	22.3	21.1	20.5	20.4	25	19.4
Iron					26300	31500	32800	27100	20100	26200	25800	28700	25200
Lead	35	91.3	**57**	110	12.4	11.6	15.2	16.2	11.5	10.1	13	12.1	12.3
Lithium					10.5	10.5	15.2	16.2	13.3	14.7	13.9	15.6	15.5
Magnesium					4340	5330	3440	3430	3100	4030	1930	4160	3530
Manganese					189	201	264	150	70	180	105	251	138
Mercury	0.17	0.486	**0.3**	0.58	0.03	0.04	0.05	0.05	0.1	0.07	0.04	0.04	0.03
Molybdenum					1.3	1.6	1.8	1.8	1.3	1.5	1.1	1.7	1.5
Nickel					20.4	19.4	33.2	24.6	28.4	32	19.7	26.3	19.9
Phosphorus					957	998	1180	770	1480	1700	911	542	398
Potassium					2190	2300	2450	2040	1640	1860	1850	1920	1600
Selenium					0.7	0.7	1.2	1.3	2.2	2.9	1.1	0.9	0.6
Silver					< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Sodium					89	88	113	75	59	65	128	69	76
Strontium					28	28	48	31	50	45	25	31	24
Thallium					0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Tin					0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5
Titanium					92	78	78	100	55	52	64	94	118
Uranium					0.7	0.8	1.3	2	5.1	6.6	1.4	1.4	1.2
Vanadium					32	29	45	48	51	50	36	45	45
Zinc	123	315	**200**	380	89	71	152	80	40	46	75	78	64
Zirconium					1.9	2.1	4	1	1.8	1.5	1.1	3.4	1.9

Notes:
All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs= metres below ground surface
1. Canadian Sediment Quality Guidelines for the Protection of Aquatic Life - Interim freshwater sediment quality guidelines
2. Canadian Sediment Quality Guidelines for the Protection of Aquatic Life - Probable effect levels - Freshwater
3. Sch 3.4, Generical Numerical Sediment Standards, Freshwater Sediment Sensitive from B.C. Contaminated Sites Regulation (CSR) standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).
4. Sch 3.4, Generical Numerical Sediment Standards, Freshwater Sediment Typical from B.C. CSR standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).
< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
FDA = Field Duplicate Available; FD = Field Duplicate.

Table 29
Results of Sediment Analyses - Petroluem Hydrocarbons and PAHs
K19 - Trutch Former Townsite
Alaska Highway, BC

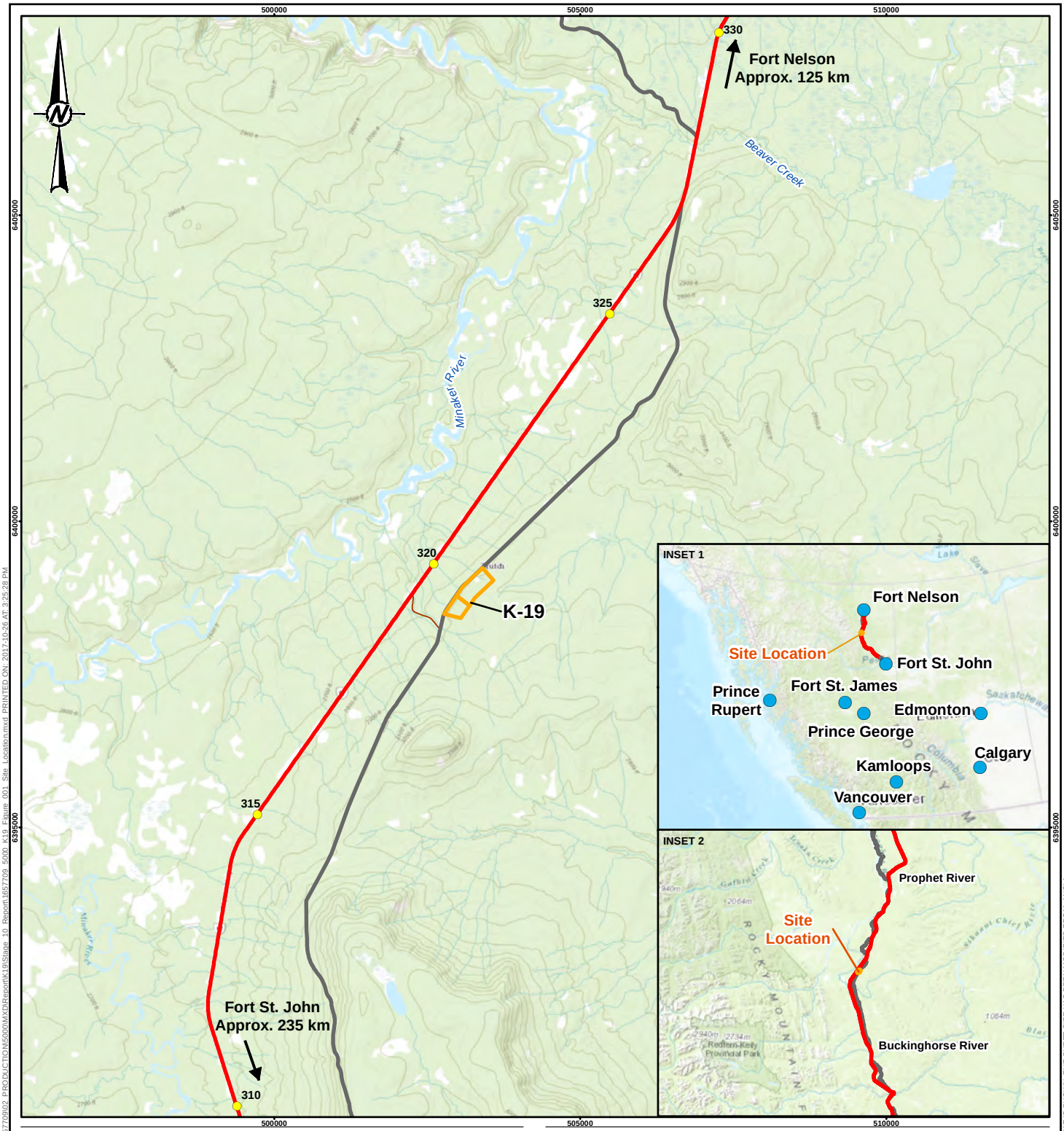
Location					K19-SS17-01	K19-SS17-02	K19-SS17-03	K19-SS17-04	K19-SS17-05	K19-SS17-05	K19-SS17-06	K19-SS17-07	K19-SS17-08
Sample Control Number					03813-01	03813-02	03813-03	03813-04	03813-05	03813-06	03813-07	03813-08	03813-09
Laboratory Report Number					17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971
Sample Date					7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017
Sample Depth (mbgs)					0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
QA/QC									FDA	FD			
PAH													
Acenaphthene	0.00671	0.0889	**0.055**	0.11	< 0.005	-	*< 0.01*	-	*< 0.01*	*< 0.01*	-	< 0.005	-
Acenaphthylene	0.00587	0.128	**0.08**	0.15	< 0.005	-	0.02	-	*< 0.01*	*< 0.01*	-	< 0.005	-
Anthracene	0.0469	0.245	**0.15**	0.29	< 0.004	-	0.032	-	< 0.008	< 0.008	-	< 0.004	-
Benzo(a)anthracene	0.0317	0.385	**0.24**	0.46	< 0.03	-	*< 0.06*	-	*< 0.06*	*< 0.06*	-	< 0.03	-
Benzo(a)pyrene	0.0319	0.782	**0.48**	0.94	< 0.03	-	*< 0.06*	-	*< 0.06*	*< 0.06*	-	< 0.03	-
Benzo(b)fluoranthene					< 0.05	-	< 0.1	-	< 0.1	< 0.1	-	< 0.05	-
Benzo(b,j) fluoranthene					< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-
Benzo[j]fluoranthene					< 0.05	-	< 0.1	-	< 0.1	< 0.1	-	< 0.05	-
Benzo(g,h,i)perylene					< 0.05	-	< 0.1	-	< 0.1	< 0.1	-	< 0.05	-
Benzo(k)fluoranthene					< 0.05	-	< 0.1	-	< 0.1	< 0.1	-	< 0.05	-
Chrysene	0.0571	0.862	**0.53**	1	< 0.05	-	*< 0.1*	-	*< 0.1*	*< 0.1*	-	< 0.05	-
Dibenzo(a,h)anthracene	0.00622	0.135	**0.084**	0.16	< 0.005	-	*< 0.01*	-	*< 0.01*	*< 0.01*	-	< 0.005	-
Fluoranthene	0.111	2.355	**1.5**	2.8	< 0.01	-	0.07	-	< 0.02	< 0.02	-	< 0.01	-
Fluorene	0.0212	0.144	**0.089**	0.17	< 0.02	-	0.05	-	*< 0.04*	*< 0.04*	-	< 0.02	-
Indeno(1,2,3-c,d)pyrene					< 0.02	-	< 0.04	-	< 0.04	< 0.04	-	< 0.02	-
Naphthalene	0.0346	0.391	**0.24**	0.47	< 0.005	-	0.19	-	< 0.01	< 0.01	-	< 0.005	-
Phenanthrene	0.0419	0.515	**0.32**	0.62	< 0.02	-	0.22	-	< 0.04	< 0.04	-	< 0.02	-
Pyrene	0.053	0.875	**0.54**	1.1	< 0.01	-	0.11	-	< 0.02	< 0.02	-	< 0.01	-
Quinoline					< 0.05	-	< 0.1	-	< 0.1	< 0.1	-	< 0.05	-
1-Methylnaphthalene					< 0.005	-	0.1	-	0.01	< 0.01	-	< 0.005	-
2-methylnaphthalene	0.0202	0.201	**0.12**	0.24	< 0.005	-	0.08	-	< 0.01	< 0.01	-	< 0.005	-
Benzo(a)pyrene Total Potency Equivalence (TPE)					< 0.05	-	< 0.1	-	< 0.1	< 0.1	-	< 0.05	-
Index of Additive Cancer Risk (IACR)					< 0.6	-	< 1	-	< 1	< 1	-	< 0.6	-
Extractable Hydrocarbons													
EPH (C10-C19)					38	-	102	-	< 40	< 40	-	< 20	-
LEPH (C10-C19) Less PAHs					38	-	101	-	< 40	< 40	-	< 20	-
EPH (C19-C32)					347	-	423	-	74	< 40	-	< 20	-
HEPH (C19-C32) Less PAHs					347	-	422	-	74	< 40	-	< 20	-
Volatile Hydrocarbons													
Benzene					< 0.02	< 0.02	< 0.02	< 0.02	< 0.06	< 0.04	< 0.02	< 0.02	< 0.02
Toluene					< 0.05	< 0.05	0.32	< 0.05	< 0.2	< 0.1	< 0.05	< 0.05	< 0.05
Ethylbenzene					< 0.05	< 0.05	< 0.05	< 0.05	< 0.2	< 0.1	< 0.05	< 0.05	< 0.05
Methyl tert-Butyl Ether					< 0.1	< 0.1	< 0.1	< 0.1	< 0.3	< 0.2	< 0.1	< 0.1	< 0.1
Styrene					< 0.05	< 0.05	< 0.05	< 0.05	< 0.2	< 0.1	< 0.05	< 0.05	< 0.05
o-Xylene					< 0.05	< 0.05	< 0.05	< 0.05	< 0.2	< 0.1	< 0.05	< 0.05	< 0.05
m,p-Xylenes					< 0.05	0.05	< 0.05	< 0.05	< 0.2	< 0.1	< 0.05	< 0.05	< 0.05
Xylenes, Total					< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.2	< 0.1	< 0.2	< 0.1
Volatile Hydrocarbon Fraction					< 10	< 10	< 10	< 10	< 30	< 20	< 10	< 10	< 10
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected					< 10	< 10	< 10	< 10	< 30	< 20	< 10	< 10	< 10

Notes:
All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs= metres below ground surface
1. Canadian Sediment Quality Guidelines for the Protection of Aquatic Life - Interim freshwater sediment quality guidelines
2. Canadian Sediment Quality Guidelines for the Protection of Aquatic Life - Probable effect levels - Freshwater
3. Sch 3.4, Generical Numerical Sediment Standards, Freshwater Sediment Sensitive from B.C. Contaminated Sites Regulation (CSR) standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).
4. Sch 3.4, Generical Numerical Sediment Standards, Freshwater Sediment Typical from B.C. CSR standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).
< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
FDA = Field Duplicate Available; FD = Field Duplicate.

Table 30
Results of Sediment Analyses - Volatile Organic Compounds
K19 - Trutch Former Townsite
Alaska Highway, BC

Location ID					K19-SS17-01	K19-SS17-02	K19-SS17-03	K19-SS17-04	K19-SS17-05	K19-SS17-05	K19-SS17-06	K19-SS17-07	K19-SS17-08
Sample Control Number	CCME Interim Sediment Quality Guidelines (ISQG) Freshwater [1]	CCME Probable Effect Levels (PEL) Freshwater [2]	Stage 10 Amendments to CSR Freshwater Sediment Standard for Sensitive Use [3]	Stage 10 Amendments to CSR Freshwater Sediment Standard for Typical Use [4]	03813-01	03813-02	03813-03	03813-04	03813-05	03813-06	03813-07	03813-08	03813-09
Laboratory Report Number					17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971
Sample Date					7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017
Sample Depth (mbgs)					0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
QA/QC									FDA	FD			
Volatile Organic Compounds													
Acetone					< 0.5	-	< 0.5	-	< 2	< 1	-	< 0.5	-
2-Butanone					< 0.5	-	< 0.5	-	< 2	< 1	-	< 0.5	-
Bromodichloromethane (BDCM)					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
Bromomethane (Methyl bromide)					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
Bromoform (Tribromomethane)					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
Carbon Tetrachloride					< 0.02	-	< 0.02	-	< 0.06	< 0.04	-	< 0.02	-
Chlorobenzene					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
Chloroethane					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
Chloroform					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
Chloromethane					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
Dichloromethane (DCM) (Methylene Chloride)					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
Dibromochloromethane (DBCM)					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
1,2-dichlorobenzene					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
1,3-dichlorobenzene					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
1,4-dichlorobenzene					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
1,1-dichloroethane					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
1,2-dichloroethane					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
1,1-dichloroethene					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
1,2-dichloroethylene (Cis) (1,2-dichloroethene)					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
1,2-dichloroethylene (Trans) (1,2-dichloroethene)					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
1,2-dichloropropane (Propylene Dichloride)					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
1,3-dichloropropene (Cis)					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
1,3-dichloropropene (Trans)					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
4-Methyl-2-pentanone					< 0.5	-	< 0.5	-	< 2	< 1	-	< 0.5	-
1,1,1,2-tetrachloroethane					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
1,1,2,2-tetrachloroethane					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
Tetrachloroethylene (PCE/PERC)					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
1,2,4-Trichlorobenzene					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
1,1,1-trichloroethane					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
1,1,2-trichloroethane					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
Trichloroethylene (TCE)					< 0.01	-	< 0.01	-	< 0.03	< 0.02	-	< 0.01	-
Trichlorofluoromethane (Freon 11)					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-
Vinyl Chloride (Chloroethene)					< 0.05	-	< 0.05	-	< 0.2	< 0.1	-	< 0.05	-

Notes:
All parameter units in milligrams per kilogram (mg/kg), unless otherwise noted; m bgs= metres below ground surface
1. Canadian Sediment Quality Guidelines for the Protection of Aquatic Life - Interim freshwater sediment quality guidelines
2. Canadian Sediment Quality Guidelines for the Protection of Aquatic Life - Probable effect levels - Freshwater
3. Sch 3.4, Generical Numerical Sediment Standards, Freshwater Sediment Sensitive from B.C. Contaminated Sites Regulation (CSR) standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).
4. Sch 3.4, Generical Numerical Sediment Standards, Freshwater Sediment Typical from B.C. CSR standards shown are from the November 1, 2017 (B.C. Reg 253/2016 and B.C. Reg 196/2017).
< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
FDA = Field Duplicate Available; FD = Field Duplicate.



LEGEND

- COMMUNITY / TOWN / CITY
- KILOMETRE POST
- ALASKA HIGHWAY 2007 SURVEYED ALIGNMENT
- ALASKA HIGHWAY FORMER ALIGNMENT
- SECONDARY ROAD
- SITE LOCATION

DRAFT

0 1.5 3

1:90,000 KILOMETRES

NOTE

KILOMETRE POSTS ARE COUNTED FROM KILOMETRE 0 OF THE ALASKA HIGHWAY IN DAWSON CREEK, BC, APPROXIMATELY 75 KILOMETRES SOUTH OF FORT ST. JOHN.

REFERENCE(S)

1. TOPO MAP OBTAINED FROM ESRI, HERE, DELORME, INTERMAP, GEBCO, USGS, FAO, NPS, NRCAN AND THE GIS USER COMMUNITY.
2. COMMUNITY, TOWN AND CITY LOCATIONS AND NAMES OBTAINED FROM CANVEC AND GEOGRATIS © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
3. KILOMETRE POSTS AND ALASKA HIGHWAY ALIGNMENTS OBTAINED FROM ARCADIS.
4. PROJECTION: UTM ZONE 10N DATUM: WGS84

CLIENT
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

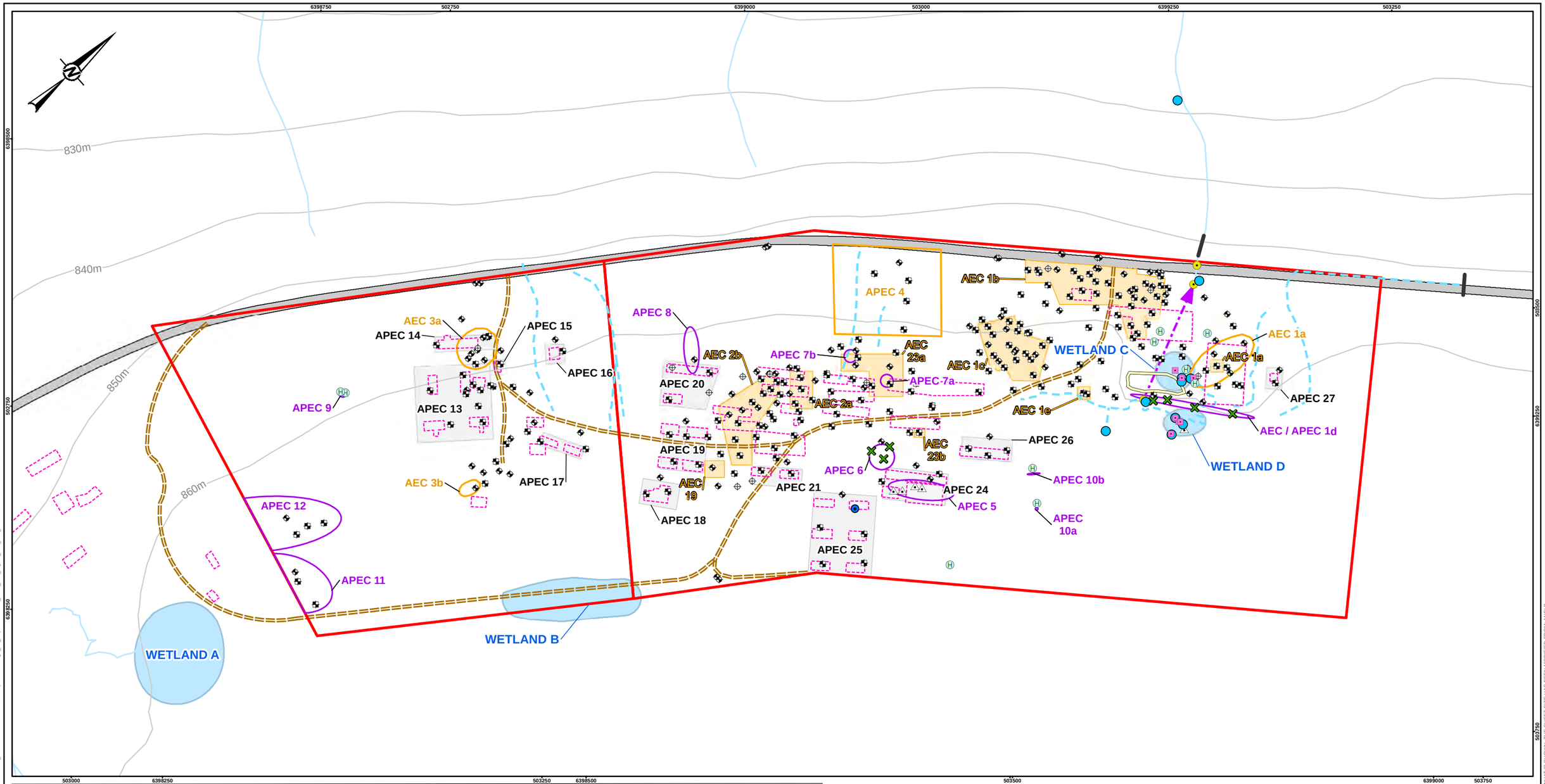
PROJECT
K-19 TRUTCH FORMER TOWNSITE
ALASKA HIGHWAY, B.C.

TITLE
SITE LOCATION

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-10-26
DESIGNED	KN
PREPARED	RC
REVIEWED	
APPROVED	

PROJECT NO.	CONTROL	REV.	FIGURE
1657709	5000	A	1



LEGEND

- SURFACE SAMPLE
- DW WELL
- BOREHOLE
- MONITORING WELL
- TEST PIT
- SEDIMENT SAMPLE
- HAND DUG SURFACE SOIL SAMPLE
- HAND AUGER
- SURFACE WATER
- WOODEN CULVERT
- STEEL CULVERT
- CONTOUR (10m)
- SECONDARY ROAD
- INFERRED UNDERGROUND WATERCOURSE
- APPROXIMATE SEASONAL SWALE / DRAINAGE DITCH
- WATERCOURSE
- APPROXIMATE WETLAND
- ALASKA HIGHWAY FORMER ALIGNMENT
- APPROXIMATE LOCATION OF AREA OF POTENTIAL ENVIRONMENTAL CONCERN DEFINED BY GOLDER IN 2016 BASED ON FIELD OBSERVATIONS
- APPROXIMATE LOCATION OF AREA OF POTENTIAL ENVIRONMENTAL CONCERN DEFINED BY GOLDER IN 2016 BASED ON 1951 GATOR MAP
- AREA OF POTENTIAL ENVIRONMENTAL CONCERN (APEC) OR AREA OF ENVIRONMENTAL CONCERN (AEC) DEFINED BY ARCADIS
- APPROXIMATE LOCATION OF HISTORICAL BUILDINGS
- SITE LOCATION
- REVISED AEC BOUNDARY BASED ON ESTIMATED EXTENT OF PETROLEUM HYDROCARBON CONTAMINATION
- WOOD DEBRIS PILE

DRAFT

0 50 100

1:3,000 METRES

REFERENCE(S)

1. CONTOURS OBTAINED FROM ARCADIS.
2. SURFACE SAMPLES OBTAINED FROM ARCADIS AND GOLDER ASSOCIATES LTD.
3. DW WELL, CULVERT, APPROXIMATE WETLAND AND APPROXIMATE SWALE/DRAINAGE DITCH OBTAINED FROM GOLDER ASSOCIATES LTD.
4. BOREHOLES OBTAINED FROM ARCADIS AND VECTOR GEOMATICS.
5. TEST PITS AND MONITORING WELLS OBTAINED FROM ARCADIS, VECTOR GEOMATICS, AND GOLDER ASSOCIATES LTD.
6. ALASKA HIGHWAY FORMER ALIGNMENT AND SECONDARY ROADS OBTAINED BY ARCADIS, PORTIONS DERIVED BY VECTOR GEOMATICS, FEBRUARY 7TH AND 8TH, 2017.
7. WATERCOURSES OBTAINED BY B.C. MINISTRY OF FORESTS, LAND AND NATURAL RESOURCE OPERATIONS.
8. PROJECTION: UTM ZONE 10N DATUM: WGS84

CLIENT
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-10-26
DESIGNED	CJ
PREPARED	RC
REVIEWED	
APPROVED	

PROJECT
K-19 TRUTCH FORMER TOWNSITE
ALASKA HIGHWAY, B.C.

TITLE
SITE PLAN

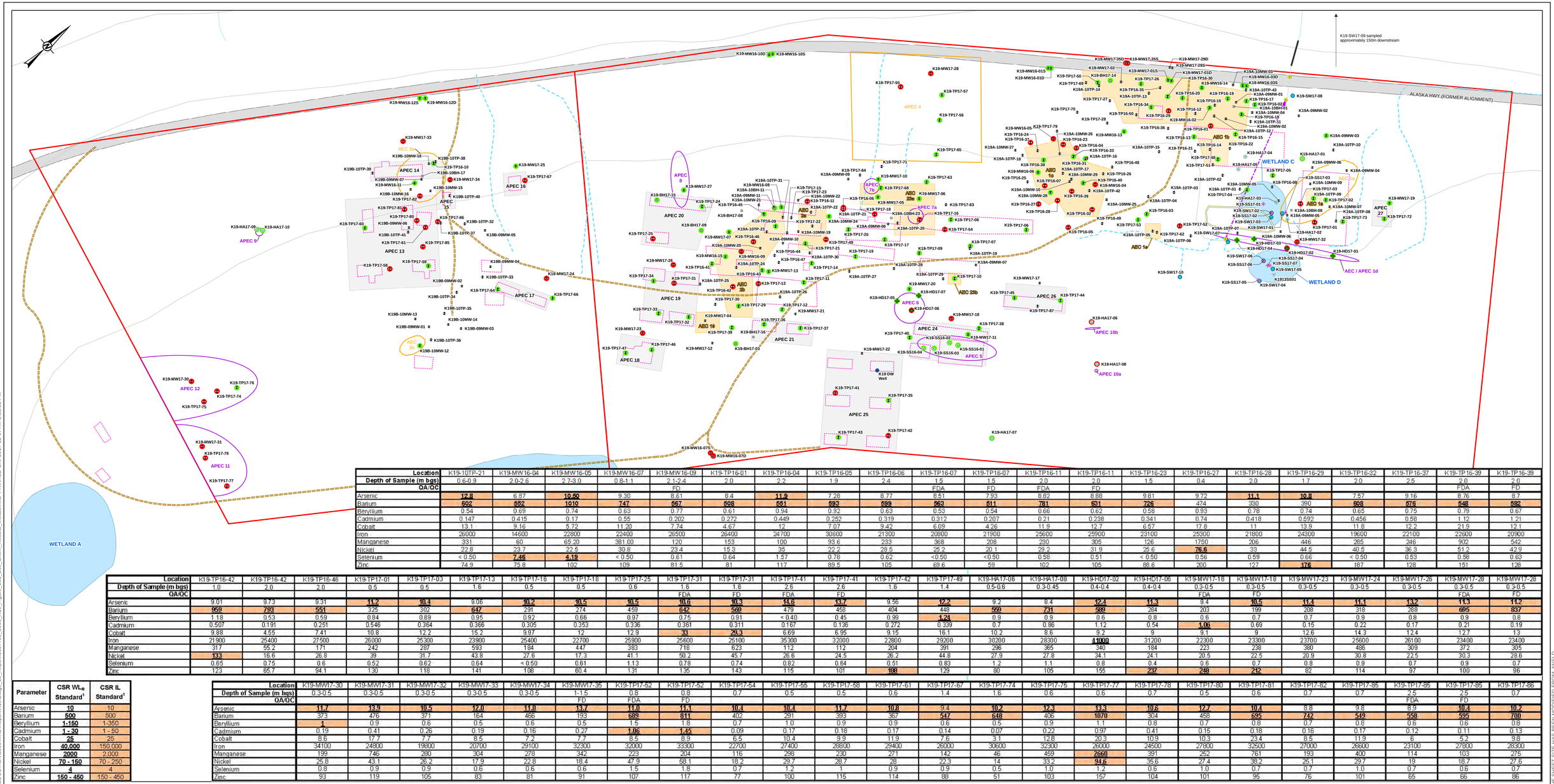
PROJECT NO.	CONTROL	REV.	FIGURE
1657709	5000	A	2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25mm

0

PATH: \\golder.gds\ga\burnaby\CAD-GIS\Client\PWGSC\Alaska_Highway\99_PROJECTS\1657709\02_PRODUCTION\5000\MXD\Report\K19\Stage_10_Report\1657709_5000_K-19_Figure_002_Site_Plan.mxd PRINTED ON: 2017-10-26 AT 3:42:00 PM



Location	K19-10TP-21	K19-MW16-04	K19-MW16-05	K19-MW16-07	K19-MW16-09	K19-TP16-01	K19-TP16-04	K19-TP16-05	K19-TP16-06	K19-TP16-07	K19-TP16-07	K19-TP16-11	K19-TP16-11	K19-TP16-23	K19-TP16-27	K19-TP16-28	K19-TP16-29	K19-TP16-32	K19-TP16-37	K19-TP16-39	K19-TP16-39
Depth of Sample (m bgs)	0.6-0.9	2.0-2.6	2.7-3.0	0.8-1.1	2.1-2.4	2.0	2.2	1.9	2.4	1.5	1.5	2.0	2.0	1.5	0.4	2.0	1.7	2.0	2.5	2.0	2.0
QA/QC					FD					FDA	FD	FDA	FD							FDA	FD
Arsenic	**12.8**	6.87	**10.50**	9.30	8.61	8.4	**11.9**	7.28	8.77	8.51	7.93	8.82	8.88	9.81	9.72	**11.1**	**10.8**	7.57	9.16	8.76	8.7
Barium	**602**	**552**	**1010**	**747**	**567**	**508**	**551**	**593**	**599**	**563**	**511**	**781**	**631**	**726**	474	330	390	**608**	**576**	**548**	**582**
Beryllium	0.54	0.69	0.74	0.63	0.77	0.61	0.94	0.92	0.63	0.53	0.54	0.66	0.62	0.58	0.93	0.78	0.74	0.65	0.75	0.79	0.67
Cadmium	0.147	0.415	0.17	0.55	0.202	0.272	0.449	0.252	0.319	0.312	0.207	0.21	0.238	0.341	0.74	0.418	0.592	0.456	0.58	1.12	1.21
Cobalt	13.1	9.16	5.72	11.20	7.74	4.67	12	7.07	9.42	6.09	4.26	11.9	12.7	6.57	17.8	11	13.9	11.9	12.2	21.9	12.1
Iron	26000	14600	22800	22400	26500	26400	24700	30600	21300	20800	21900	25600	25900	23100	25300	21800	24300	19600	22100	22600	20900
Manganese	331	60	65.20	381.00	120	153	100	93.6	233	368	208	230	305	126	1750	206	446	265	246	902	542
Nickel	22.8	23.7	22.5	30.8	23.4	15.3	35	22.2	28.5	25.2	20.1	29.2	31.9	25.6	**76.6**	33	44.5	40.5	36.3	51.2	42.9
Selenium	< 0.50	**7.46**	**4.19**	< 0.50	0.61	0.64	1.57	0.78	0.62	<0.50	<0.50	0.58	0.51	< 0.50	0.56	0.59	0.66	< 0.50	0.53	0.58	0.63
Zinc	74.9	75.8	102	109	81.5	81	117	89.5	105	69.6	59	102	105	88.6	200	127	**176**	187	128	151	128

Location	K19-TP16-42	K19-TP16-42	K19-TP16-46	K19-TP17-01	K19-TP17-03	K19-TP17-13	K19-TP17-16	K19-TP17-18	K19-TP17-25	K19-TP17-31	K19-TP17-31	K19-TP17-41	K19-TP17-41	K19-TP17-42	K19-TP17-49	K19-HA17-06	K19-HA17-08	K19-HD17-02	K19-HD17-06	K19-MW17-18	K19-MW17-18	K19-MW17-23	K19-MW17-24	K19-MW17-26	K19-MW17-28	K19-MW17-28
Depth of Sample (m bgs)	1.0	2.0	2.0	0.5	0.5	1.6	0.5	0.5	0.6	1.6	1.8	2.6	2.6	1.6	1.4	0.5-0.6	0.3-0.45	0.4-0.4	0.4-0.4	0.3-0.5	0.3-0.5	0.3-0.5	0.3-0.5	0.3-0.5	0.3-0.5	0.3-0.5
QA/QC										FDA	FD	FDA	FD							FDA	FD				FDA	FD
Arsenic	9.01	9.73	9.31	**11.2**	**10.4**	9.06	**10.2**	**10.5**	**10.5**	**10.6**	**10.3**	**14.6**	**13.7**	9.56	**12.2**	9.2	8.4	**12.4**	**11.3**	9.4	**10.5**	**11.4**	**11.1**	**13.2**	**11.3**	**11.2**
Barium	**959**	**793**	**551**	325	302	**647**	291	274	459	**642**	**569**	479	458	404	448	**559**	**731**	**589**	284	203	199	208	318	288	**695**	**837**
Beryllium	1.18	0.53	0.59	0.84	0.89	0.95	0.92	0.66	0.97	0.75	0.91	< 0.40	0.45	0.99	**1.24**	0.9	0.9	0.6	0.8	0.6	0.7	0.7	0.9	0.8	0.9	0.8
Cadmium	0.507	0.191	0.251	0.546	0.364	0.366	0.305	0.353	0.336	0.361	0.311	0.167	0.138	0.272	0.339	0.07	0.86	1.12	0.54	**1.09**	0.69	0.15	0.22	0.17	0.21	0.19
Cobalt	9.88	4.55	7.41	10.8	12.2	15.2	9.97	12	12.9	**33**	**29.3**	6.69	6.95	9.15	16.1	10.2	8.6	9.2	9	9.1	9	12.6	14.3	12.4	12.7	13
Iron	21900	25400	27500	26000	25300	23900	25400	22700	25900	25600	25100	35300	32000	22800	29200	30200	28300	**41000**	31200	22300	23300	23700	25600	26100	23400	23400
Manganese	317	55.2	171	242	287	593	184	447	383	718	623	112	112	204	391	296	365	340	184	223	238	380	486	309	372	305
Nickel	**133**	16.6	26.8	39	31.7	43.8	27.6	17.3	41.1	50.2	45.7	26.6	24.5	26.2	44.8	27.9	27.8	34.1	24.1	20.5	22.5	20.9	30.8	22.5	30.3	28.6
Selenium	0.65	0.75	0.6	0.52	0.62	0.64	< 0.50	0.61	1.13	0.78	0.74	0.82	0.64	0.51	0.83	1.2	1.1	0.8	0.4	0.6	0.7	0.8	0.9	0.7	0.9	0.7
Zinc	123	65.7	94.1	130	118	141	108	60.4	131	135	143	115	101	**188**	129	80	105	155	**237**	**248**	**212**	82	114	97	100	96

Parameter	CSR WL_R Standard[1]	CSR IL Standard[1]
Arsenic	10	10
Barium	500	500
Beryllium	1-150	1-350
Cadmium	1 - 30	1 - 50
Cobalt	25	25
Iron	40,000	150,000
Manganese	2000	2,000
Nickel	70 - 150	70 - 250
Selenium	4	4
Zinc	150 - 450	150 - 450

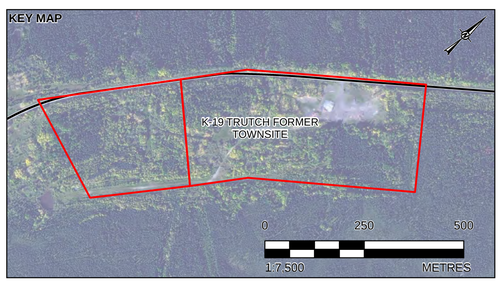
Location	K19-MW17-30	K19-MW17-31	K19-MW17-32	K19-MW17-33	K19-MW17-34	K19-MW17-35	K19-TP17-52	K19-TP17-52	K19-TP17-54	K19-TP17-55	K19-TP17-58	K19-TP17-61	K19-TP17-67	K19-TP17-74	K19-TP17-75	K19-TP17-77	K19-TP17-78	K19-TP17-80	K19-TP17-81	K19-TP17-82	K19-TP17-85	K19-TP17-85	K19-TP17-85	K19-TP17-86
Depth of Sample (m bgs)	0.3-0.5	0.3-0.5	0.3-0.5	0.3-0.5	0.3-0.5	1-1.5	0.8	0.8	0.7	0.5	0.5	0.6	1.4	1.6	0.6	0.6	0.7	0.5	0.6	0.7	0.7	2.5	2.5	0.7
QA/QC						FD	FDA	FD														FDA	FD	
Arsenic	**11.7**	**13.9**	**10.5**	**12.0**	**11.0**	**13.7**	**11.0**	**11.1**	**10.4**	**10.4**	**11.7**	**10.8**	9.4	**10.2**	**12.3**	**13.3**	**10.6**	**12.7**	**10.4**	8.8	9.8	8.9	**10.4**	**10.2**
Barium	373	476	371	164	466	193	**689**	**811**	402	291	393	367	**547**	**648**	406	**1070**	304	458	**695**	**742**	**549**	**558**	**595**	**700**
Beryllium	**1**	0.9	0.6	0.5	0.6	0.5	1.5	1.8	0.7	1.0	0.9	0.9	0.8	0.5	0.9	1.1	0.8	0.7	0.8	0.7	0.8	0.6	0.6	0.8
Cadmium	0.19	0.41	0.26	0.19	0.16	0.27	**1.06**	**1.45**	0.09	0.17	0.18	0.17	0.14	0.07	0.22	0.97	0.41	0.15	0.18	0.16	0.17	0.12	0.11	0.13
Cobalt	8.6	17.7	7.7	8.5	7.2	7.7	8.5	8.9	6.5	10.4	9.9	11.9	7.6	3.1	12.8	20.3	10.9	10.3	23.4	8.5	11.9	6	5.2	9.8
Iron	34100	24800	19800	20700	29100	32300	32000	33300	22700	27400	26800	29400	26000	30600	32300	26000	24500	27800	32500	27000	26600	23100	27800	28300
Manganese	199	746	280	304	278	342	223	204	116	298	230	271	142	46	459	**2660**	391	252	761	193	400	114	103	275
Nickel	25.8	43.1	26.2	17.9	22.8	18.4	47.9	58.1	18.2	29.7	28.7	28	22.3	14	33.2	**94.6**	35.6	27.4	38.2	25.1	29.7	19	18.7	27.6
Selenium	0.8	0.9	0.9	0.6	0.6	0.6	1.5	1.8	0.7	1.2	1	0.9	0.9	0.5	1.0	1.2	0.6	1.0	0.7	0.7	1.0	0.7	0.6	0.7
Zinc	93	119	105	83	81	91	107	117	77	100	115	114	88	51	103	157	104	101	95	76	101	65	66	86

LEGEND

- SURFACE SAMPLE
- DW WELL
- BOREHOLE
- MONITORING WELL
- TEST PIT
- SEDIMENT SAMPLE
- HAND DUG SURFACE SOIL SAMPLE
- HAND AUGER
- SURFACE WATER
- WOODEN CULVERT
- CONTOUR (10m)
- SECONDARY ROAD
- APPROXIMATE SEASONAL SWALE / DRAINAGE DITCH
- WATERCOURSE
- INFERRED UNDERGROUND WATERCOURSE
- INFERRED GROUNDWATER FLOW DIRECTION
- APPROXIMATE WETLAND
- ALASKA HIGHWAY FORMER ALIGNMENT
- APPROXIMATE LOCATION OF AREA OF POTENTIAL ENVIRONMENTAL CONCERN DEFINED BY GOLDER IN
- APPROXIMATE LOCATION OF AREA OF POTENTIAL ENVIRONMENTAL CONCERN DEFINED BY GOLDER IN
- APPROXIMATE LOCATION OF HISTORICAL BUILDINGS
- SITE LOCATION
- REVISED AEC BOUNDARY BASED ON ESTIMATED EXTENT OF PETROLEUM HYDROCARBON CONTAMINATION
- WOOD DEBRIS PILE

SOIL CHEMISTRY RESULTS - TOTAL METALS

- One or more parameters ANALYZED EXCEED THE MOST CONSERVATIVE CSR STAGE 10 STANDARDS FOR WILDLANDS (REVERTED) AND/OR INDUSTRIAL LAND USE
- PARAMETERS ANALYZED MET THE MOST CONSERVATIVE CSR STAGE 10 STANDARDS FOR WILDLANDS (REVERTED) AND/OR INDUSTRUAL LAND USE



0 50 100
1:1,250 METRES

DRAFT

REFERENCES

1. APEC, MONITORING WELLS, TESTPITS AND CONTOURS OBTAINED FROM ARCADIS.
2. IMAGERY OBTAINED FROM BING MAPS FOR ARCGIS PUBLISHED BY MICROSOFT CORPORATION, REDMOND, WA, MAY 2009.
3. WATERCOURSES OBTAINED BY B.C. MINISTRY OF FORESTS, LAND AND NATURAL RESOURCE OPERATIONS.
4. CONTOURS DERIVED FROM CANVEC, MODIFIED BY GOLDER ASSOCIATES LTD.
5. PROJECTION: UTM ZONE 10N DATUM: WGS84

NOTES

1. BC MOE PROTOCOL 4 FOR THE PEACE REGION WAS APPLIED WHEN ITS CONCENTRATION WAS HIGHER THAN THE CORRESPONDING CSR STANDARD.
2. ALL PARAMETER UNITS IN MILLIGRAMS PER KILOGRAM (MG/KG), UNLESS OTHERWISE NOTED; M = METRES; BGS = BELOW GROUND SURFACE.
3. LOCATIONS WHERE NO SAMPLES WERE ANALYSED ARE COLORED BLACK AND ARE NOT HIGHLIGHTED GREEN OR RED.
4. APEC SHOWN FOR ILLUSTRATIVE PURPOSES.

CLIENT
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

CONSULTANT
Golder Associates

YYYY-MM-DD	2016-08-19
DESIGNED	EOB
PREPARED	RC / CD
REVIEWED	
APPROVED	

PROJECT
K-19 TRUTCH FORMER TOWNSITE
ALASKA HIGHWAY, B.C.

TITLE
SOIL CHEMISTRY RESULTS - TOTAL METALS

PROJECT NO.	CONTROL	REV.	FIGURE
1657709	5000	0	3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

0 25mm

PATH: Y:\Burnaby\CAD-GIS\Client\PWGSC\Alaska_Highway\99_PROJECTS\1657709\02_PRODUCTION\5000\MXD\Report\k19Stage 10_Report\1657709_5000_K19_Figure_003_Soil_Chem_Results_Metals.mxd PRINTED ON: 2017-12-07 AT: 2:53:55 PM

Parameters	CSR WL_R Standard	CSR IL Standard
Chloride (ion)	100	100
Sodium (ion)	200	1,000

Location	K19-TP16-08	K19-TP16-08	K19-HA17-04	K19-HA17-04	K19-TP17-03	K19-TP17-03	K19-TP17-05	K19-TP17-05	K19-TP17-05	K19-TP17-05	K19-TP17-05	K19-TP17-09	K19-TP17-19
Depth of Sample (m bgs)	0.5	2.8	0.4-0.6	0.4-0.6	0.5	2.5	0.5	0.5	1.6	2.6	3.5	0.5	0.4
QA/QC							FDA	FD					
Chloride (ion)	166	1,030	103	156	3,350	2,400	1,740	1,080	1,090	617	143	824	563
Sodium (ion)	190	121	68	100	2,050	883	989	695	443	132	24	476	344

0 50 100
1:1,250 METRES

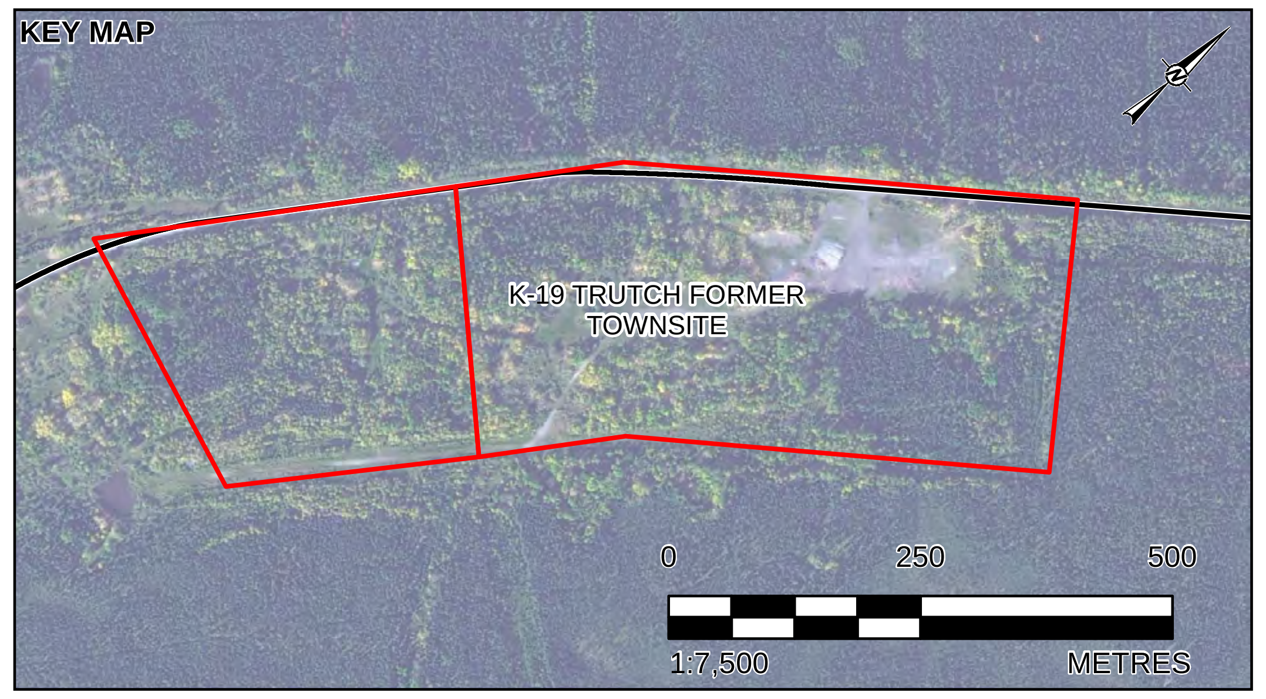
DRAFT

LEGEND

◬	SURFACE SAMPLE
⦿	DW WELL
⌖	BOREHOLE
◆	MONITORING WELL
▪	TEST PIT
▣	SEDIMENT SAMPLE
✖	HAND DUG SURFACE SOIL SAMPLE
Ⓗ	HAND AUGER
●	SURFACE WATER
⊙	WOODEN CULVERT
—	CONTOUR (10m)
====	SECONDARY ROAD
- - -	APPROXIMATE SEASONAL SWALE / DRAINAGE DITCH
—	WATERCOURSE
-·▶	INFERRED UNDERGROUND WATERCOURSE
→	INFERRED GROUNDWATER FLOW DIRECTION
▭	APPROXIMATE WETLAND
▭	ALASKA HIGHWAY FORMER ALIGNMENT
▭	APPROXIMATE LOCATION OF AREA OF POTENTIAL ENVIRONMENTAL CONCERN DEFINED BY GOLDER IN
▭	APPROXIMATE LOCATION OF AREA OF POTENTIAL ENVIRONMENTAL CONCERN DEFINED BY GOLDER IN
⬚	APPROXIMATE LOCATION OF HISTORICAL BUILDINGS
🟥	SITE LOCATION
▭	REVISED AEC BOUNDARY BASED ON ESTIMATED EXTENT OF PETROLEUM HYDROCARBON CONTAMINATION
▭	WOOD DEBRIS PILE

SOIL CHEMISTRY RESULTS - SODIUM AND CHLORIDE (SATURATED PASTE)

🔴	One or more parameters ANALYZED EXCEED THE MOST CONSERVATIVE CSR STAGE 10 STANDARDS FOR WILDLANDS (REVERTED) AND/OR INDUSTRIAL LAND USE
🟢	PARAMETERS ANALYZED MET THE MOST CONSERVATIVE CSR STAGE 10 STANDARDS FOR WILDLANDS (REVERTED) AND/OR INDUSTRUAL LAND USE



REFERENCES

1. APEC, MONITORING WELLS, TESTPITS AND CONTOURS OBTAINED FROM ARCADIS.
2. IMAGERY OBTAINED FROM BING MAPS FOR ARCGIS PUBLISHED BY MICROSOFT CORPORATION, REDMOND, WA, MAY 2009.
3. WATERCOURSES OBTAINED BY B.C. MINISTRY OF FORESTS, LAND AND NATURAL RESOURCE OPERATIONS.
4. CONTOURS DERIVED FROM CANVEC, MODIFIED BY GOLDER ASSOCIATES LTD.
5. PROJECTION: UTM ZONE 10N DATUM: WGS84

NOTES

1. ALL PARAMETER UNITS IN MILLIGRAMS PER KILOGRAM (MG/KG), UNLESS OTHERWISE NOTED; M = METRES; BGS = BELOW GROUND SURFACE.
2. LOCATIONS WHERE NO SAMPLES WERE ANALYSED ARE COLORED BLACK AND ARE NOT HIGHLIGHTED GREEN OR RED.
3. APEC SHOWN FOR ILLUSTRATIVE PURPOSES.

CLIENT
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

PROJECT
K-19 TRUTCH FORMER TOWNSITE
ALASKA HIGHWAY, B.C.

CONSULTANT
Golder Associates

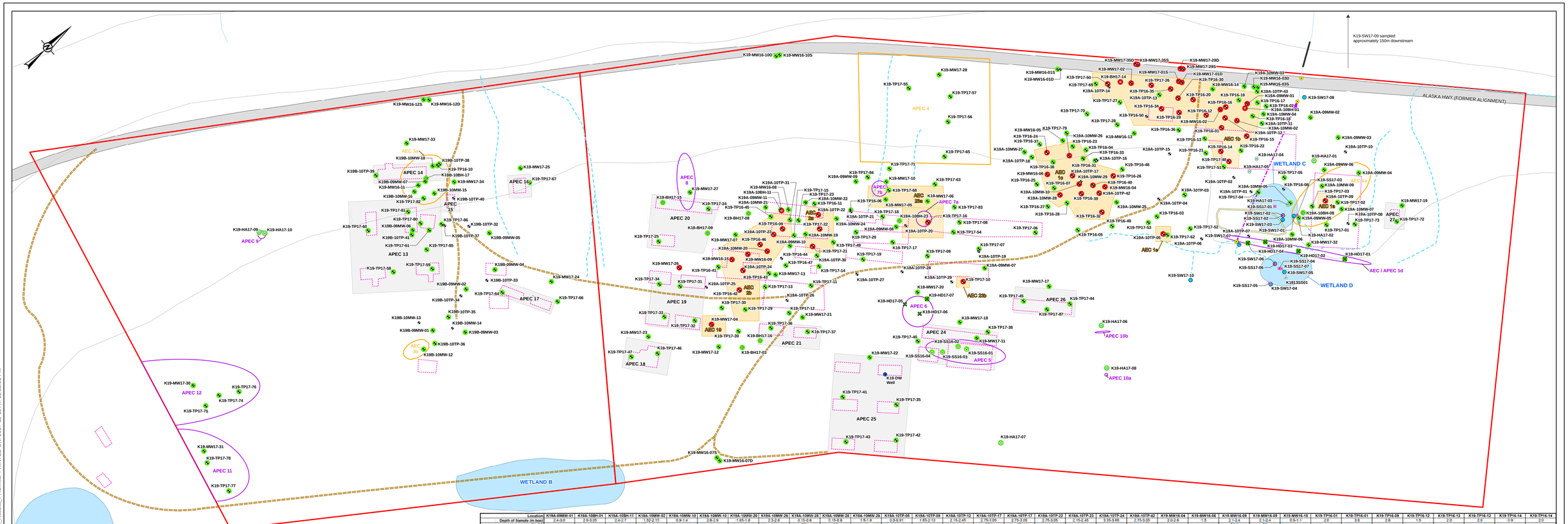
YYYY-MM-DD	2016-08-19
DESIGNED	EOB
PREPARED	RC / CD
REVIEWED	
APPROVED	

TITLE
SOIL CHEMISTRY RESULTS
- SODIUM AND CHLORIDE (SATURATED PASTE)

PROJECT NO.	CONTROL	REV.	FIGURE
1657709	5000	0	4

PATH: Y:\burnaby\CAD-GIS\Client\PWGSC\Alaska_Highway\99_PROJECTS\1657709\02_PRODUCTION\5000\MXD\Report\K19\Stage_10_Report\1657709_5000_K19_Figure_004_Soil_Chem_Results_Sodium.mxd PRINTED ON: 2017-10-20 AT: 4:10:50 PM

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D
25mm
0



Location	K19A-09MW-01	K19A-10BH-01	K19A-10BH-11	K19A-10MW-02	K19A-10MW-10	K19A-10MW-20	K19A-10MW-26	K19A-10MW-26	K19A-10MW-28	K19A-10MW-29	K19A-10MW-28	K19A-10TP-05	K19A-10TP-09	K19A-10TP-12	K19A-10TP-17	K19A-10TP-17	K19A-10TP-22	K19A-10TP-23	K19A-10TP-24	K19A-10TP-42	K19-MW16-04	K19-MW16-06	K19-MW16-09	K19-MW16-09	K19-MW16-15	K19-TP16-01	K19-TP16-01	K19-TP16-09	K19-TP16-12	K19-TP16-12	K19-TP16-12	K19-TP16-14	K19-TP16-14
Depth of Sample (m bgs)	2.4-3.0	2.9-3.05	2.4-2.7	1.52-2.13	0.9-1.4	2.6-2.9	1.65-1.8	2.3-2.8	0.15-0.8	0.15-0.6	1.5-1.8	0.3-0.91	1.83-2.13	2.15-2.45	2.75-3.05	2.75-3.05	2.75-3.05	2.15-2.45	3.35-3.65	2.75-3.05	2.0-2.6	1.5	2.1-2.4	2.1-2.4	0.5-1.1	2.0	3.6	2.8	1.5	2.0	2.9	0.9	2.0
QA/QC									FDA	FD					FDA	FD							FDA	FD									
Benzene	< 0.04	< 0.0050	0.20	-	< 0.34	0.33	-	0.89	< 0.20	-	< 0.17	-	-	-	1.7	2.3	-	-	-	1.3	3.8	0.089	0.091	0.091	< 0.0050	0.045	0.14	< 0.0050	0.031	0.020	0.052	< 0.0050	-
Toluene	< 0.3	< 0.020	< 0.025	-	0.32	1.8	-	6.8	3.3	-	1.1	-	-	-	2.3	3.2	-	-	-	< 0.046	4.3	1.2	< 0.020	< 0.020	< 0.020	0.30	< 0.020	< 0.020	0.025	< 0.020	0.041	-
Ethylbenzene	< 0.5	0.034	0.23	-	0.87	1.2	-	3.7	0.050	-	< 0.34	-	-	-	8.7	9.6	-	-	-	4.3	3.8	0.98	0.56	0.53	< 0.010	0.96	1.7	0.19	0.29	0.46	0.94	0.050	-
Xylenes	< 0.1	< 0.040	0.16	-	6.0	6.4	-	23	28	-	20	-	-	-	14	16	-	-	-	7.9	21	4.7	0.59	0.54	< 0.040	0.81	2.5	1.5	0.11	0.53	0.36	0.095	-
F1 - BTEX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	730	820	-	-	-	570	-	-	-	-	-	-	750	-	120	190	210	240	-
F1 (C6-C10)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	790	-	-	-	580	-	-	-	-	-	-	750	-	120	190	210	240	-
F2 (C10-C16)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-C19)	1,100	1,400	< 100	8,300	-	1,130	1,290	915	2,020	-	4,470	10,900	892	14,200	-	-	1,190	7,570	3,020	-	4,250	447	4,430	2,160	5,395	2,900	1,870	798	1,700	8,950	4,200	4,300	2,900
EPH(C19-C32)	380	113	< 100	397	-	< 100	< 100	129	< 100	-	203	1090	< 100	310	-	790	< 100	< 100	670	130	291	198	< 100	< 100	166	231	391	< 100	130	410	280	630	110
LEPH	1,100	1,400	< 100	8,300	-	1,130	1,290	911	-	-	4,440	10,900	891	-	-	-	-	-	-	-	4,250	445	4,430	2,170	5,395	2,900	1,870	797	1,700	8,900	4,200	4,300	2,900
HEPH	380	113	< 100	397	-	< 100	< 100	126	-	-	203	1090	< 100	-	-	-	-	-	-	-	291	198	< 100	< 100	166	231	391	< 100	130	410	280	630	110
VPH	470	53	-	-	470	390	-	220	630	630	-	-	-	-	620	690	-	-	-	520	320	150	220	220	31	230	720	69	110	150	180	200	-
VH(C6-C10)	< 100	53	-	-	460	400	260	200	600	550	-	-	-	-	730	730	290	-	-	530	550	160	250	230	31	230	720	71	110	150	180	200	-
Naphthalene	< 0.05	< 0.33	0.015	18	1.9	3.5	2.8	-	-	30	< 0.14	1	29	-	-	-	1.2	16	5.3	-	5.8	0.86	7.3	3.7	< 0.12	2.1	0.99	1.7	3.2	9.6	5.3	0.098	7.1
2-Methylnaphthalene	< 0.05	0.33	0.017	82	1.4	0.99	7.4	-	-	58	< 0.21	0.7	120	-	-	-	3.5	15	11	-	19	3.1	1.3	0.8	< 0.095	7.2	3.5	3.7	8.1	0.27	-	25	-

Location	K19-TP16-15	K19-TP16-16	K19-TP16-20	K19-TP16-20	K19-TP16-24	K19-TP16-24	K19-TP16-26	K19-TP16-26	K19-TP16-29	K19-TP16-29	K19-TP16-30	K19-TP16-30	K19-TP16-30	K19-TP16-30	K19-TP16-32	K19-TP16-32	K19-TP16-32	K19-TP16-34	K19-TP16-34	K19-TP16-35	K19-TP16-35	K19-TP16-35	K19-TP16-35	K19-TP16-35	K19-TP16-39	K19-TP16-39	K19-TP16-39	K19-TP16-40	K19-TP16-40	K19-TP16-42	K19-TP16-46	K19-BH17-14	K19-BH17-14	K19-BH17-14
Depth of Sample (m bgs)	2.1	2.0	2.9	3.8	2.5	2.5	1.5	3.8	4.3	4.3	1.0	2.9	3.8	4.3	2.9	2.9	2.9	3.4	2.0	2.0	3.5	3.8	4.4	2.0	2.0	3.5	3.8	2.5	3.5	2.5	3.5	2.5	3.5
QA/QC					FD										FDA	FD				FD					FDA	FD								
Benzene	0.011	0.084	0.057	0.19	0.013	<0.0050	0.20	0.035	< 0.0050	0.75	1.8	20	13	19	0.12	0.25	-	4.7	0.20	-	-	19	1.7	18	1.1	0.89	0.40	0.39	< 0.0050	< 0.0050	0.085	0.56	0.25
Toluene	< 0.020	< 0.020	< 0.020	0.23	0.087	0.039	0.061	< 0.020	1.8	1.4	37	110	7.2	8.3	0.060	0.025	-	0.86	-	-	-	7.3	14	3.3	0.65	0.72	0.79	0.11	< 0.020	< 0.020	0.16	< 0.020	0.26
Ethylbenzene	0.30	0.24	0.17	2.3	0.14	0.075	0.40	0.078	7.1	1.7	6.8	54	19	7.8	0.70	2.5	-	7.3	-	-	-	34	9.9	16	6.1	5.2	5.15	0.17	0.011	0.011	< 0.010	< 0.010	0.02
Xylenes	< 0.040	< 0.040	0.17	2.4	0.18	0.04	1.3	0.28	15	3.1	190	310	52	21	1.5	10	-	13	-	-	-	53	39	39	22	18	47	2.6	< 0.040	< 0.040	< 0.040	0.040	0.045
F1 - BTEX	79	100	110	300	82	<10	69	36	250	110	3,300	5,600	1,200	760	-	-	-	-	-	-	-	-	36	-	540	-	520	2100	430	40	62	< 10	< 10	12
F1 (C6-C10)	80	100	110	300	82	<10	71	37	270	120	3,600	7,200	840	-	-	-	-	-	-	-	-	-	-	-	580	550	2200	430	40	62	< 10	< 10	12
F2 (C10-C16)	-	-	-	-	-	-	-	-	-	-	4,500	1,500	-	-	-	-	-	-	-	-	-	-	-	-	2500	5300	1800	1800	-	19000	-	-	-
F3 (C16-C34)	-	-	-	-	-	-	-	-	-	-	650	160	-	-	-	-	-	-	-	-	-	-	-	-	250	460	160	2600	-	2600	-	-	-
EPH(C10-C19)	1,700	5,400	4,100	1,800	2,400	1,400	150	690	400	300	4,700	1,600	-	600	5,800	-	2,200	280	410	510	510	150	700	-	1,400	2,000	4,700	5,700	1,700	1,400	22,000	< 100	< 100
EPH(C19-C32)	150	390	260	350	370	300	140	< 100	380	460	510	130	-	370	230	-	210	< 100	230	120	140	-	140	-	< 100	170	140	< 100	< 100	890	< 100	< 100	-
LEPH	1,700	5,400	4,100	1,800	2,400	1,400	150	690	400	300	4,700	1,600	-	550	5,700	-	2,200	280	400	500	510	-	690	-	1,400	2,000	4,700	5,700	1,700	1,400	22,000	< 100	< 100
HEPH	150	390	260	350	370	300	130	< 100	380	460	510	130	-	370	230	-	210	< 100	230	120	140	-	140	-	< 100	170	140	< 100	< 100	890	< 100	< 100	-
VPH	72	80	110	260	73	<10	59	33	220	91	3,200	6,100	1,400	690	220	210	-	540	210	37	<10	-	-	1200	480	440	2000	2300	280	37	56	< 10	< 10	11
VH(C6-C10)	72	80	110	260	73	<10	60	34	220	88	3,400	6,400	-	760	220	220	-	530	-	37	<10	-	-	1200	510	490	2000	2300	280	37	56	< 10	< 10	11
Naphthalene	0.37	3.9	3.3	2.1	0.16	0.067	<0.010	0.32	1.8	0.29	26	11	-	2.4	6.1	-	1.2	2.4	2.3	3.8	3.8	-	4.4	-	4.3	1.9	3.8	0.13	0.033	0.41	0.011	< 0.010	< 0.010
2-Methylnaphthalene	0.26	2.4	5.6	2.9	0.32	0.22	<0.020	0.21	0.51	0.089	9.2	4.2	-	1.2	1.4	-	3.2	0.98	1.2	1.4	1.5	-	2.1	-	13	37	16	0.76	0.12	2.2	0.03	< 0.020	-

Location	K19-MW17-01	K19-MW17-01	K19-MW17-01	K19-MW17-01	K19-MW17-02	K19-MW17-02	K19-MW17-02	K19-MW17-04	K19-MW17-04	K19-MW17-06	K19-MW17-26	K19-MW17-26	K19-MW17-28D	K19-MW17-28D	K19-MW17-28D	K19-MW17-35D	K19-MW17-35D	K19-MW17-35D	K19-MW17-35D	K19-TP17-10	K19-TP17-10	K19-TP17-16	K19-TP17-16	K19-TP17-16	K19-TP17-21	K19-TP17-21	K19-TP17-22	K19-TP17-22	K19-TP17-26	K19-TP17-26	K19-TP17-48	K19-TP17-48	K19-TP17-50
Depth of Sample (m bgs)	1.5	2.5	3.5	4.5	8.6	1.5	2.5	5.9	1.4	2.5	8.0-8.8	11.0-11.8	2.5-2.8	3.4-3.7	3.4-3.7	1.1-1.5	1.5-1.8	2.4-2.7	6.5-7.0	0.9	0.5	1.9	1.5	2.4	2.4	4.4	6.2	0.8	3.9	4.4	4.9	5.1	-
QA/QC		FDA	FD											FDA	FD	FD	FDA	FD		FD	FDA	FD	FDA	FD	FDA	FD	FDA	FD	FDA	FD			
Benzene	0.83	1.9	2.7	0.075	0.015	0.035	0.23	0.22	< 0.0050	< 0.0050	< 0.02	< 0.02	0.04	0.05	0.08	< 0.02	< 0.02	0.3	0.39	0.08	0.35	0.65	< 0.0050	0.0065	0.006	0.0078	-	0.011	25	1.8	0.0087	0.0097	0.033
Toluene	0.054	0.35	0.64	0.025	0.71	0.16	0.052	0.21	< 0.020	0.39	1.33	0.74	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	0.05	1.6	2.5	< 0.02	< 0.020	< 0.020	< 0.020	< 0.020	-	< 0.020	3.7	1.09	0.82	0.31	3.8
Ethylbenzene	0.011	4.3	5.1	0.041	0.014	0.21	0.26	0.097	0.013	0.015	0.81	0.87	< 0.05	0.08	0.14	0.12	0.11	1.13	1.63	< 0.05	0.14	0.21	0.27	0.43	0.16	0.21	-	0.27	11	0.63	< 0.010	< 0.010	0.012
Xylenes	0.054	3	4.2	0.057	< 0.040	< 0.040	0.056	0.41	< 0.040	< 0.040	3.2	3.7	< 0.1	< 0.2	0.3	0.3	0.3	0.9	0.3	< 0.1	1.7	2.5	0.21	0.15	0.54	0.27	-	0.45	38	2.3	< 0.040	< 0.040	< 0.040
F1 - BTEX	31	255	360	32	22	< 10	< 10	17	52	13	-	-	-	-	-	-	-	-	-	-	-	< 10	190	350	53	51	-	52	830	51	< 10	< 10	12
F1 (C6-C10)	32	260	360	33	23	< 10	< 10	18	52	14	-	-	-	-	-	-	-	-	-	-	-	12	190	350	53	52	-	53	580	57	< 10	< 10	16
F2 (C10-C16)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH(C10-C19)	< 100	320	340	< 100	< 100	< 100	390	290	1,200	720	46	110	857	484	573	374	308	61	77	79	-	-	4,800	4,600	1,100	1,100	4,800	1,900	360	250	< 100	190	250
EPH(C19-C32)	< 100	120	140	< 100	< 100	< 100	< 100	120	< 100	< 100	40	88	119	85	99	400	318	66	82	100	-	-	< 200	< 200	160	170	310	120	200	210	< 100	310	340
LEPH	< 100	320	340	< 100	< 100	< 100	390	290	1,200	710	44	108	857	483	572	372	307	60	76	79	-	-	4,800	4,600	1,100	1,100	4,800	1,900	380	250	< 100	190	250
HEPH	< 100	120	140	< 100	< 100	< 100	< 100	120	< 100	< 100	40	87	116	84	98	400	318	66	82	100	-	-	< 200	< 200	160	170	310	120	200	210	< 100	310	340
VPH	32	410	340	26	29	< 10	< 10	13	50	13	45	84	< 10	30	46	19	17	34	42	< 10	< 10	< 10	190	340	51	49	-	49	500	48	< 10	< 10	< 10
VH(C6-C10)	33	420	350	26	21	< 10	< 10	14	50	13	50	89	< 10	31	47	20	17	36	44	< 10	11	< 10	190	340	51	50	-	49	550	54	< 10	< 10	13
Naphthalene	< 0.010	1.3	1.3	0.33	0.49	0.012	0.13	0.021	0.028	0.071	1	1.39	0.308	0.746	0.96	1.17	1.01	0.387	0.471	0.016	-	-	3	2.1	0.40	0.47	0.044	2.1	1.2	0.24	0.015	< 0.010	0.012
2-Methylnaphthalene	< 0.020	0.76	0.79	0.98	0.98	0.023	0.17	0.052	0.10	0.20	1.38	2.59	< 0.005	0.34	0.51	3.76	3.29	0.119	0.064	0.19	-	-	0.59	0.38	0.29	0.35	0.19	0.1	0.41	0.13	0.042	0.030	0.038

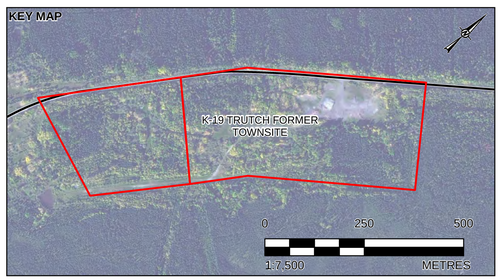
Parameter	CSR W_{ng} Standard	CSR IL Standard
Benzene	0.036	0.005
Toluene	0.5	0.5
Ethylbenzene	15	15
Xylenes	0.5	0.5
F1 - BTEX	200	200
F1 (C6-C10)	200	200
F2 (C10-C16)	1,000	2,000
F3 (C16-C34)	1,000	5,000
EPH(C10-C19)	1,000	2,000
EPH(C19-C32)	1,000	5,000
LEPH	1,000	2,000
HEPH	1,000	5,000
VPH	200	200
VH(C6-C10)	200	200
Naphthalene	0.6	20
2-Methylnaphthalene	100	950

LEGEND

- SURFACE SAMPLE
- DW WELL
- BOREHOLE
- MONITORING WELL
- TEST PIT
- SEDIMENT SAMPLE
- HAND DUG SURFACE SOIL SAMPLE
- HAND AUGER
- SURFACE WATER
- WOODEN CULVERT
- CONTOUR (10m)
- SECONDARY ROAD
- APPROXIMATE SEASONAL SWALE / DRAINAGE DITCH
- WATERCOURSE
- INFERRED UNDERGROUND WATERCOURSE
- INFERRED GROUNDWATER FLOW DIRECTION
- APPROXIMATE WETLAND
- ALASKA HIGHWAY FORMER ALIGNMENT
- APPROXIMATE LOCATION OF AREA OF POTENTIAL ENVIRONMENTAL CONCERN DEFINED BY GOLDER IN
- APPROXIMATE LOCATION OF AREA OF POTENTIAL ENVIRONMENTAL CONCERN DEFINED BY GOLDER IN
- APPROXIMATE LOCATION OF HISTORICAL BUILDINGS
- SITE LOCATION
- REVISED AEC BOUNDARY BASED ON ESTIMATED EXTENT OF PETROLEUM HYDROCARBON CONTAMINATION
- WOOD DEBRIS PILE

SOIL CHEMISTRY RESULTS - PETROLEUM HYDROCARBONS, POLYCYCLIC AROMATIC HYDROCARBONS, BTEX AND VPH

- One or more parameters ANALYZED EXCEED THE MOST CONSERVATIVE CSR STAGE 10 STANDARDS FOR WILDLANDS (REVERTED) AND/OR INDUSTRIAL LAND USE
- PARAMETERS ANALYZED MET THE MOST CONSERVATIVE CSR STAGE 10 STANDARDS FOR WILDLANDS (REVERTED) AND/OR INDUSTRUAL LAND USE



0 50 100
1:1,250 METRES

DRAFT

REFERENCES

1. APEC, MONITORING WELLS, TESTPITS AND CONTOURS OBTAINED FROM ARCADIS.
2. IMAGERY OBTAINED FROM BING MAPS FOR ARCGIS PUBLISHED BY MICROSOFT CORPORATION, REDMOND, WA, MAY 2009.
3. WATERCOURSES OBTAINED BY B.C. MINISTRY OF FORESTS, LAND AND NATURAL RESOURCE OPERATIONS.
4. CONTOURS DERIVED FROM CANVEC, MODIFIED BY GOLDER ASSOCIATES LTD.
5. PROJECTION: UTM ZONE 10N DATUM: WGS84

NOTES

1. ALL PARAMETER UNITS IN MILLIGRAMS PER KILOGRAM (MG/KG), UNLESS OTHERWISE NOTED; M = METRES; BGS = BELOW GROUND SURFACE.
2. LOCATIONS WHERE NO SAMPLES WERE ANALYSED ARE COLORED BLACK AND ARE NOT HIGHLIGHTED GREEN OR RED.
3. APEC SHOWN FOR ILLUSTRATIVE PURPOSES.

CLIENT
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

CONSULTANT
Golder Associates

YYYY-MM-DD	2016-08-19
DESIGNED	EOB
PREPARED	RC / CD
REVIEWED	
APPROVED	

PROJECT
K-19 TRUTCH FORMER TOWNSITE
ALASKA HIGHWAY, B.C.

TITLE
SOIL CHEMISTRY RESULTS - PETROLEUM HYDROCARBONS, POLYCYCLIC AROMATIC HYDROCARBONS, BTEX AND VPH

PROJECT NO.	CONTROL	REV.	FIGURE
1657709	5000	0	5

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

0 25mm

PATH: \\golder.gds\gal\burnaby\CAD-GIS\Client\PWGSC\Alaska_Highway\09_PROJECT\S1\1657709\02_PRODUCTION\MS0001\MXD\Report\K-19\Stage_10_Report\1657709_5000_k19_Figure_005_Soil_Chem_Results_PHC.mxd PRINTED ON: 2017-12-15 AT: 12:32:31 PM

K19-SW17-09 sampled approximately 150m downstream

ALASKA HWY. (FORMER ALIGNMENT)

WETLAND A

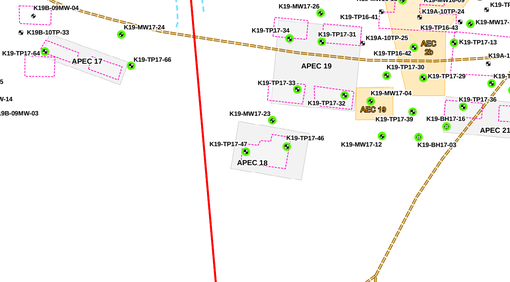
WETLAND B

WETLAND C

WETLAND D

APEC 1a
APEC 1b
APEC 2
APEC 3a
APEC 3b
APEC 4
APEC 5
APEC 6
APEC 7a
APEC 7b
APEC 8
APEC 9
APEC 10a
APEC 10b
APEC 11
APEC 12
APEC 13
APEC 14
APEC 15
APEC 16
APEC 17
APEC 18
APEC 19
APEC 20
APEC 21
APEC 22a
APEC 22b
APEC 23a
APEC 23b
APEC 24
APEC 25
APEC 26
APEC 27
AEC 1c
AEC 1d
AEC / APEC 1d
AEC 2a
AEC 2b
AEC 3a
AEC 3b

K19-MW16-10D K19-MW16-10S K19-MW16-12S K19-MW16-12D K19-MW17-33 K19-MW17-25 K19-MW16-07S K19-MW16-07D K19-MW17-30 K19-TP17-76 K19-TP17-74 K19-TP17-75 K19-MW17-31 K19-TP17-78 K19-TP17-77 K19-HA17-09 K19-HA17-10 K19-TP17-67 K19-MW17-28 K19-TP17-55 K19-TP17-57 K19-TP17-56 K19-TP17-65 K19-MW17-35D K19-MW17-35S K19-MW17-29D K19-MW17-29S K19-MW17-01D K19-MW17-01S K19-MW17-02 K19-BH17-14 K19-TP17-50 K19-TP17-49 K19-TP16-35 K19-TP17-26 K19-TP16-34 K19-TP16-13 K19-TP17-27 K19-TP17-70 K19-TP17-28 K19-TP16-50 K19-TP16-29 K19-MW16-02 K19-MW16-01S K19-MW16-01D K19-MW16-14 K19-MW16-03D K19-MW16-03S K19-10MW-03 K19-SW17-08 K19-09MW-01 K19-09MW-02 K19-10BH-01 K19-10MW-04 K19-10MW-02 K19-10TP-11 K19-10TP-12 K19-TP16-01 K19-TP16-15 K19-TP16-22 K19-TP16-14 K19-TP16-21 K19-TP16-13 K19-TP16-36 K19-TP16-12 K19-TP16-20 K19-TP16-19 K19-TP16-16 K19-TP16-02 K19-TP16-17 K19-10TP-13 K19-10TP-14 K19-10TP-43 K19-MW16-13 K19-MW16-26 K19-TP16-23 K19-TP16-04 K19-TP16-33 K19-10TP-16 K19-TP16-31 K19-10TP-17 K19-10MW-29 K19-TP16-26 K19-TP16-60 K19-MW16-04 K19-10TP-42 K19-TP16-48 K19-10TP-15 K19-10MW-25 K19-TP16-49 K19-TP17-53 K19-TP16-03 K19-10TP-04 K19-10TP-03 K19-10TP-02 K19-10MW-05 K19-10TP-01 K19-TP17-04 K19-TP16-09 K19-TP17-05 K19-HA17-05 K19-HA17-04 K19-HA17-01 K19-09MW-06 K19-09MW-04 K19-09MW-03 K19-10TP-10 K19-SS17-03 K19-10MW-09 K19-TP17-03 K19-10TP-09 K19-TP17-02 K19-10BH-08 K19-09MW-05 K19-10MW-07 K19-10TP-08 K19-TP17-73 K19-TP17-72 K19-MW17-19 K19-TP17-01 K19-HA17-02 K19-MW17-32 K19-HD17-03 K19-HD17-04 K19-HD17-02 K19-HD17-01 K19-SS17-04 K19-SS17-07 K19-SW17-05 K19-SS17-05 K19-SW17-04 K191SS01 K19-SW17-06 K19-SW17-07 K19-SW17-01 K19-SW17-02 K19-SW17-03 K19-SS17-01 K19-SS17-02 K19-10MW-06 K19-TP17-62 K19-10TP-06 K19-10TP-07 K19-SW17-10 K19-MW17-12 K19-TP17-45 K19-TP17-44 K19-TP17-87 K19-HA17-06 K19-HA17-08 K19-TP17-07 K19-10MW-07 K19-TP17-06 K19-TP17-54 K19-TP17-52 K19-TP17-83 K19-TP17-16 K19-TP17-08 K19-10BH-23 K19-10TP-20 K19-10TP-21 K19-10TP-22 K19-TP16-11 K19-TP16-06 K19-MW17-05 K19-TP17-18 K19-TP17-68 K19-MW17-10 K19-TP17-63 K19-TP17-71 K19-TP17-84 K19-09MW-09 K19-MW17-06 K19-10TP-31 K19-MW16-08 K19-10BH-11 K19-09MW-11 K19-10MW-22 K19-10MW-21 K19-TP17-15 K19-TP17-23 K19-TP16-45 K19-BH17-08 K19-TP17-24 K19-BH17-15 K19-BH17-09 K19-TP17-25 K19-TP16-09 K19-10TP-23 K19-09MW-07 K19-TP16-46 K19-10MW-20 K19-10MW-10 K19-10MW-19 K19-TP17-20 K19-TP17-49 K19-TP17-17 K19-TP17-21 K19-TP17-19 K19-TP16-44 K19-TP16-47 K19-10TP-30 K19-TP17-14 K19-TP17-11 K19-MW17-26 K19-TP16-41 K19-MW16-15 K19-MW16-09 K19-10TP-24 K19-MW17-13 K19-TP16-43 K19-TP17-34 K19-TP17-31 K19-10TP-25 K19-TP17-13 K19-TP16-42 K19-10TP-26 K19-TP17-12 K19-TP17-29 K19-TP17-30 K19-TP17-33 K19-TP17-32 K19-MW17-04 K19-TP17-39 K19-BH17-16 K19-BH17-03 K19-MW17-21 K19-TP17-36 K19-TP17-37 K19-MW17-23 K19-TP17-47 K19-TP17-46 K19-MW17-12 K19-10TP-27 K19-10TP-28 K19-10TP-29 K19-MW17-20 K19-HD17-07 K19-HD17-05 K19-HD17-06 K19-MW17-18 K19-TP17-38 K19-MW17-11 K19-TP17-40 K19-SS16-02 K19-SS16-03 K19-SS16-04 K19-SS16-01 K19-MW17-22 K19 DW Well K19-TP17-41 K19-TP17-35 K19-TP17-43 K19-TP17-42 K19-HA17-07 K19-MW17-07 K19-10MW-10 K19-10MW-28 K19-TP16-27 K19-TP16-28 K19-TP16-32 K19-TP16-05 K19-10TP-05 K19-10MW-11 K19-TP16-25 K19-TP16-38 K19-MW16-06 K19-TP16-07 K19-MW16-05 K19-TP16-24 K19-TP16-37 K19-10MW-27 K19-10TP-18 K19-TP17-79 K19-10MW-26 K19-TP16-37 K19-10MW-18 K19-10MW-17 K19-10TP-19 K19-10TP-32 K19-10TP-33 K19-10TP-34 K19-10TP-35 K19-10MW-13 K19-10BH-14 K19-09MW-01 K19-09MW-03 K19-10TP-36 K19-10MW-12 K19-10TP-38 K19-10BH-17 K19-10TP-39 K19-09MW-07 K19-MW16-11 K19-10MW-15 K19-10MW-16 K19-TP17-82 K19-TP17-81 K19-TP17-80 K19-09MW-06 K19-10TP-41 K19-TP17-61 K19-TP17-85 K19-TP17-40 K19-10TP-40 K19-10TP-32 K19-10TP-37 K19-09MW-05 K19-09MW-04 K19-MW17-24 K19-TP17-64 K19-TP17-66 K19-TP17-58 K19-TP17-59 K19-09MW-02



Parameter	CSR WL_R Standard	CSR IL Standard
Dichloromethane	5	50

Location	K19-TP16-30
Depth of Sample (m bgs)	2.9
QA/QC	
Dichloromethane	12

LEGEND

- SURFACE SAMPLE
- DW WELL
- BOREHOLE
- MONITORING WELL
- TEST PIT
- SEDIMENT SAMPLE
- HAND DUG SURFACE SOIL SAMPLE
- HAND AUGER
- SURFACE WATER
- WOODEN CULVERT
- CONTOUR (10m)
- SECONDARY ROAD
- APPROXIMATE SEASONAL SWALE / DRAINAGE DITCH
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- APPROXIMATE LOCATION OF AREA OF POTENTIAL ENVIRONMENTAL CONCERN DEFINED BY GOLDER IN
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- APPROXIMATE LOCATION OF HISTORICAL BUILDINGS
- SITE LOCATION
- REVISED AEC BOUNDARY BASED ON ESTIMATED EXTENT OF PETROLEUM HYDROCARBON CONTAMINATION
- WOOD DEBRIS PILE

SOIL CHEMISTRY RESULTS - VOLATILE ORGANIC COMPOUNDS

- One or more parameters ANALYZED EXCEED THE MOST CONSERVATIVE CSR STAGE 10 STANDARDS FOR WILDLIFE (REVERTED) AND/OR INDUSTRIAL LAND USE
- PARAMETERS ANALYZED MET THE MOST CONSERVATIVE CSR STAGE 10 STANDARDS FOR WILDLANDS (REVERTED) AND/OR INDUSTRUAL LAND USE

0 50 100
1:1,250 METRES

DRAFT

REFERENCES

1. APEC, MONITORING WELLS, TESTPITS AND CONTOURS OBTAINED FROM ARCADIS.
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NOTES

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3. APEC SHOWN FOR ILLUSTRATIVE PURPOSES.

CLIENT
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

CONSULTANT
Golder Associates

YYYY-MM-DD	2016-08-19
DESIGNED	EOB
PREPARED	RC / CD
REVIEWED	
APPROVED	

PROJECT
K-19 TRUTCH FORMER TOWNSITE
ALASKA HIGHWAY, B.C.

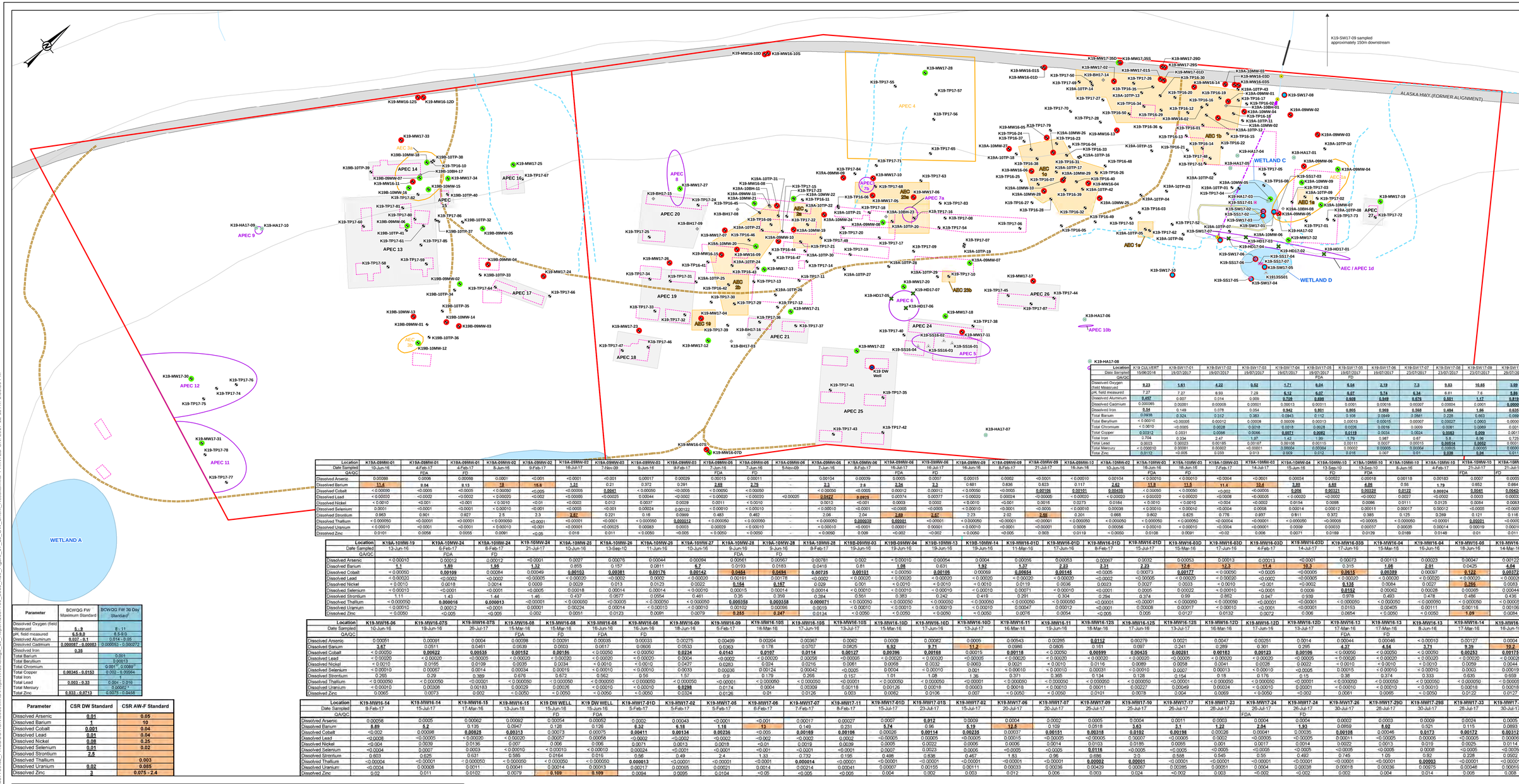
TITLE
SOIL CHEMISTRY RESULTS - VOLATILE ORGANIC COMPOUNDS

PROJECT NO.	CONTROL	REV.	FIGURE
1657709	5000	0	6

PATH: \\golder.gds\gal\burnaby\CAD-GIS\Client\PWGSC\Alaska_Hwy\way\99_PROJECTS\1657709\02_PRODUCTION\5000\MXD\Report\K19\Stage_10_Report\1657709_5000_K19_Figure_006_Soil_Chem_Results_VOC.mxd PRINTED ON: 2017-11-21 AT: 11:16:00 AM

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

0 25mm



Location	K19 CULVERT	K19-SW17-01	K19-SW17-02	K19-SW17-03	K19-SW17-04	K19-SW17-05	K19-SW17-06	K19-SW17-07	K19-SW17-08	K19-SW17-09	K19-SW17-10
Date Sampled	15/06/2016	19/07/2017	19/07/2017	19/07/2017	19/07/2017	19/07/2017	19/07/2017	23/07/2017	23/07/2017	23/07/2017	29/07/2017
QA/QC						FDA	FD	FDA	FD		
Dissolved Oxygen (field Moitored	**9.23**	**1.61**	**4.22**	**0.52**	**1.71**	**6.04**	**6.04**	**2.19**	**7.3**	**9.83**	**10.65**	**3.09**
pH, field measured	7.27	7.27	6.93	7.28	**6.12**	**6.07**	**6.07**	**5.74**	**6.34**	6.81	7.6	**5.86**
Diisolved Aluminium	**0.457**	0.007	0.014	0.009	**0.709**	**0.009**	**0.008**	**0.949**	**0.676**	**0.551**	**1.17**	**0.319**
Dissolved Cadmium	0.000065	0.00001	0.00008	0.00001	0.00013	0.00011	0.0001	0.00016	0.00007	0.00004	0.0001	**0.00009**
Dissolved Iron	**5.54**	0.149	0.078	0.054	**0.942**	**0.901**	**0.905**	**0.969**	**0.568**	**0.484**	**1.66**	**0.635**
Total Barium	0.0908	0.324	0.312	0.383	0.0943	0.112	0.109	0.0949	0.0981	0.228	0.663	0.099
Total Beryllium	< 0.00010	<0.00005	0.00012	0.00008	0.00009	0.00013	0.00013	**0.00015**	0.00007	0.00027	0.0003	0.00007
Total Chromium	< 0.0010	<0.0005	0.0028	0.0018	0.0018	0.0028	0.0026	0.0016	0.0009	0.0061	0.0069	0.001
Total Copper	0.00312	0.001	0.0066	0.0066	**0.0071**	**0.0082**	**0.0119**	0.0034	0.0024	**0.0063**	**0.009**	0.0017
Total Iron	5.704	0.334	2.47	1.97	1.42	1.99	1.79	0.987	0.67	5.8	6.66	0.725
Total Lead	0.0023	0.00023	0.00185	0.00167	0.00158	0.00115	0.00111	0.0027	0.00015	**0.00614**	**0.0052**	0.00013
Total Mercury	< 0.000010	0.00001	0.00002	<0.00001	0.00004	0.00004	0.00002	0.00005	0.00004	0.00005	0.00003	0.00003
Total Zinc	**0.0112**	<0.005	0.033	0.013	0.009	0.012	0.018	0.007	0.01	**0.038**	**0.04**	0.011

Location	K19A-09MW-01	K19A-09MW-01	K19A-09MW-01	K19A-09MW-02	K19A-09MW-02	K19A-09MW-02	K19A-09MW-03	K19A-09MW-03	K19A-09MW-03	K19A-09MW-05	K19A-09MW-05	K19A-09MW-06	K19A-09MW-06	K19A-09MW-06	K19A-09MW-06	K19A-09MW-08	K19A-09MW-09	K19A-09MW-09	K19A-09MW-09	K19A-09MW-10	K19A-10MW-02	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	K19A-10MW-04	K19A-10MW-10	K19A-10MW-10	K19A-10MW-10	K19A-10MW-10	K19A-10MW-10
Date Sampled	10-Jun-16	4-Feb-17	4-Feb-17	8-Jun-16	9-Feb-17	18-Jul-17	7-Nov-09	9-Jun-16	8-Feb-17	7-Jun-16	7-Jun-16	5-Nov-09	-	7-Jun-16	8-Feb-17	16-Jul-17	16-Jul-17	16-Jun-16	8-Feb-17	21-Jul-17	15-Jun-16	16-Jun-16	16-Jun-16	8-Feb-17	17-Jul-17	14-Jul-17	15-Jun-16	13-Sep-10	13-Sep-10	8-Jun-16	4-Feb-17	21-Jul-17	21-Jul-17
QA/QC		FDA	FD							FDA	FD			FDA	FD							FDA	FD			FDA	FD				FDA	FD
Dissolved Arsenic	0.00088	0.0006	0.00068	0.0001	<0.001	<0.001	<0.001	0.00017	0.00029	0.00015	0.00011	-	0.00104	0.00039	0.0005	0.0007	0.00015	0.0002	<0.0001	0.0001	<0.00010	0.00104	<0.00010	<0.00010	<0.0004	<0.0001	0.00024	0.00022	0.00018	0.00183	0.0007	0.0005
Dissolved Barium	**11.4**	8.04	8.13	**18**	**15.6**	**1.31**	0.21	0.372	0.291	**2.68**	**2.76**	-	**2.3**	7.8	**3.24**	**3.3**	0.681	0.636	0.623	0.117	**2.62**	**1.8**	**1.5**	**11.4**	**10.4**	**3.88**	**1.79**	0.652	0.664	0.664	0.664
Dissolved Cobalt	< 0.00050	<0.0005	<0.0005	< 0.00050	<0.005	<0.00005	**0.0041**	< 0.00050	<0.0005	< 0.00050	< 0.00050	-	< 0.00050	<0.0005	0.00012	< 0.00050	<0.0005	**0.00186**	**0.00101**	**0.00435**	< 0.00050	< 0.00050	<0.005	<0.00005	**0.006**	**0.00331**	**0.00228**	**0.0122**	**0.00924**	**0.0041**	**0.00424**
Dissolved Lead	< 0.00020	<0.0002	<0.0002	< 0.00020	<0.002	<0.00005	<0.00025	0.00044	<0.0002	< 0.00020	< 0.00020	<0.00025	**0.0427**	**0.0979**	0.00374	0.00377	< 0.00020	0.00024	<0.00005	< 0.00020	< 0.00020	< 0.00020	<0.0008	<0.00005	< 0.00020	<0.0002	<0.0002	0.0027	<0.0002	0.0003	0.00032
Dissolved Nickel	< 0.0010	<0.001	<0.001	< 0.0010	<0.01	<0.0002	0.012	0.0037	0.0029	0.0011	< 0.0010	-	0.0013	0.0011	0.0022	0.0016	0.0016	0.0273	0.0164	< 0.0010	< 0.0010	< 0.0010	<0.004	<0.0002	0.0154	0.0098	0.0085	0.0111	0.0125	0.0084	0.0083
Dissolved Selenium	0.0001	<0.0001	<0.0001	< 0.00010	<0.001	<0.0005	0.001	0.00024	0.00122	< 0.00010	< 0.00010	-	< 0.00010	<0.0001	<0.0005	< 0.00010	<0.0001	<0.0005	< 0.00010	0.00038	< 0.00010	< 0.00010	<0.0004	0.0008	0.00014	0.00012	0.00011	0.00017	0.00012	<0.0005	<0.0005
Dissolved Strontium	0.963	0.901	0.927	2.5	2.3	**2.62**	0.221	0.16	0.0969	0.483	0.482	-	2.08	2.04	**2.69**	**2.67**	2.23	2.03	**2.56**	0.201	0.668	0.802	0.825	0.776	0.937	0.911	0.372	0.385	0.125	0.269	0.121	0.116
Dissolved Thallium	< 0.000050	<0.00001	<0.00001	< 0.000050	<0.0001	<0.00001	<0.0001	**0.000312**	< 0.000050	< 0.000050	< 0.000050	-	< 0.000050	**0.000038**	**0.00061**	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	< 0.000050	< 0.000050	< 0.000050	<0.00004	<0.00001	< 0.000050	<0.00005	<0.00005	< 0.000050	< 0.000050	**0.00001**	0.00001
Dissolved Uranium	< 0.00010	<0.0001	<0.0001	< 0.00010	<0.001	<0.00001	<0.00025	0.00083	0.0003	0.00029	< 0.00010	-	< 0.00010	<0.0001	0.00001	0.00001	< 0.00010	<0.0001	<0.00001	0.0008	0.00056	< 0.00010	<0.0004	<0.00001	0.0009	0.00033	0.00037	0.00035	0.00014	0.00019	0.00018
Dissolved Zinc	0.0101	0.0058	0.0055	0.0091	<0.05	0.018	0.011	< 0.0050	<0.005	< 0.0050	< 0.0050	-	< 0.0090	0.009	<0.002	<0.002	< 0.0050	<0.005	0.003	0.0119	< 0.0050	0.0108	0.0091	<0.02	0.006	0.0071	0.0189	0.0129	0.0169	0.0148	0.01	0.011

Location	K19A-10MW-19	K19A-10MW-24	K19A-10MW-24	K19-10MW-24	K19A-10MW-25	K19A-10MW-26	K19A-10MW-26	K19A-10MW-27	K19A-10MW-28	K19A-10MW-28	K19A-10MW-28	K19B-09MW-03	K19B-09MW-04	K19B-10MW-13	K19B-10MW-14	K19-MW16-01D	K19-MW16-01D	K19-MW16-01D	K19-MW16-03D	K19-MW16-03D	K19-MW16-03D	K19-MW16-03D	K19-MW16-03D	K19-MW16-03S	K19-MW16-04	K19-MW16-04	K19-MW16-04	K19-MW16-05	K19-MW16-06
Date Sampled	13-Jun-16	8-Feb-17	8-Feb-17	21-Jul-17	10-Jun-16	13-Sep-10	11-Jun-16	10-Jun-16	9-Jun-16	9-Jun-16	9-Jun-16	8-Feb-17	19-Jun-16	19-Jun-16	19-Jun-16	11-Mar-16	17-Jun-16	8-Feb-17	15-Jul-17	16-Jun-16	8-Feb-17	14-Jul-17	17-Jun-16	15-Mar-16	16-Jun-16	18-Jun-16	14-Mar-16	16-Jun-16	18-Jun-16	14-Mar-16
QA/QC		FDA	FD							FDA	FD																		
Dissolved Arsenic	< 0.00010	0.00012	0.00012	<0.0001	0.0027	0.00276	0.00044	0.00094	0.00061	0.00067	0.002	< 0.00010	0.00054	0.0004	0.00095	0.00053	0.00057	0.0032	0.00053	0.00013	0.00013	<0.0001	0.00073	0.00113	0.00023	0.00047	0.00122		
Dissolved Barium	**1.1**	**1.85**	**1.85**	**1.32**	0.855	0.157	0.0811	**6.7**	0.0193	0.0183	0.0418	0.81	**1.08**	0.631	**1.92**	**1.37**	**2.23**	**2.31**	**2.23**	**12.6**	**12.3**	**11.4**	**10.3**	0.315	**1.08**	**2.01**	0.0425	**4.04**	
Dissolved Cobalt	< 0.00050	**0.00109**	0.00084	0.00049	**0.00103**	**0.00381**	**0.00176**	**0.00142**	**0.0484**	**0.0494**	**0.00725**	**0.00101**	< 0.00050	**0.00106**	0.00059	**0.00654**	**0.00145**	<0.0005	0.00073	**0.00177**	< 0.00050	<0.0005	<0.00005	**0.0615**	**0.00389**	0.00097	**0.122**	**0.00372**	
Dissolved Lead	< 0.00020	<0.0002	<0.0002	<0.0002	<0.00005	< 0.00020	<0.0002	0.0002	< 0.00020	0.00161	0.00178	<0.0002	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	<0.0002	<0.00005	< 0.00020	< 0.00020	<0.0002	<0.00005	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	
Dissolved Nickel	< 0.0010	<0.001	0.0014	0.0009	0.0029	0.013	0.0123	0.0022	**0.154**	**0.167**	0.029	0.001	< 0.0010	< 0.0010	< 0.0010	0.0019	0.0036	0.0023	0.0027	0.0033	< 0.0010	<0.001	<0.0002	**0.136**	0.0054	0.0027	**0.166**	0.0083	0.0083
Dissolved Selenium	< 0.00010	<0.0001	<0.0001	<0.0005	0.00018	0.00014	< 0.00010	0.00015	0.00014	0.00014	< 0.00010	< 0.00010	< 0.00010	< 0.00010	0.00071	< 0.00010	< 0.00010	0.0001	0.0005	0.00022	< 0.00010	<0.0001	0.0006	**0.0152**	0.00062	0.00028	0.00095	0.00044	
Dissolved Strontium	1.11	1.43	1.44	1.46	0.437	0.0577	0.0554	0.481	0.35	0.359	0.284	0.551	0.383	0.242	0.419	0.291	0.304	0.294	0.374	0.99	0.862	0.947	0.939	0.978	0.493	0.478	0.486	0.436	
Dissolved Thallium	< 0.000050	**0.000016**	**0.000013**	<0.00001	< 0.000050	<0.00005	< 0.000050	< 0.000050	**0.000358**	**0.000358**	**0.00077**	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.00001	<0.00001	<0.00001	<0.00001	< 0.000050	< 0.000050	<0.00001	<0.00001	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	
Dissolved Uranium	< 0.00010	0.00012	<0.0001	0.00001	0.00224	0.00014	< 0.00010	< 0.00010	0.00102	0.00098	0.0019	< 0.00010	< 0.00010	< 0.00010	< 0.00010	<0.00001	0.00012	<0.0001	0.00008	0.00017	< 0.00010	<0.0001	<0.00001	0.0153	0.00405	0.00111	0.00116	0.00106	
Dissolved Zinc	< 0.0050	<0.005	<0.005	0.002	0.0051	0.0123	0.0091	0.0079	**0.255**	**0.247**	0.0134	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.0076	0.0054	<0.005	0.005	0.0127	0.0132	0.0072	0.006	0.0854	< 0.0050	< 0.0050	**1.09**	0.0054	

Parameter	BCWQG FW Maximum Standard	BCWQG FW 30 Day Standard[2]
Dissolved Oxygen (field Moitored	**5 - 9**	8 - 11
pH, field measured	**6.5-9.0**	6.5-9.0
Diisolved Aluminium	**0.037 - 0.1**	0.014 - 0.05
Dissolved Cadmium	**0.000087 - 0.00083**	0.000053 - 0.000272
Dissolved Iron	**0.35**	
Total Barium		0.001
Total Beryllium		0.00013
Total Chromium		0.001[1] - 0.0089[1]
Total Copper	**0.00345 - 0.0153**	0.003 - 0.00564
Total Iron		1
Total Lead	**0.003 - 0.33**	0.004 - 0.016
Total Mercury		0.00002 *
Total Zinc	**0.033 - 0.0713**	0.0075 - 0.0458

Location	K19-MW16-06	K19-MW16-07S	K19-MW16-07S	K19-MW16-08	K19-MW16-08	K19-MW16-08	K19-MW16-09	K19-MW16-09	K19-MW16-10S	K19-MW16-10S	K19-MW16-10S	K19-MW16-10D	K19-MW16-10D	K19-MW16-10D	K19-MW16-10D	K19-MW16-11	K19-MW16-11	K19-MW16-12S	K19-MW16-12S	K19-MW16-12S	K19-MW16-12D	K19-MW16-12D	K19-MW16-12D	K19-MW16-13	K19-MW16-13	K19-MW16-13	K19-MW16-14	K19-MW16-14	K19-MW16-14
Date Sampled	10-Jun-16	19-Jun-16	26-Jul-17	15-Mar-16	15-Mar-16	15-Mar-16	5-Feb-17	18-Mar-16	13-Jul-17	15-Mar-16	17-Jun-16	13-Jul-17	15-Mar-16	17-Jun-16	13-Jul-17	16-Mar-16	19-Jun-16	13-Jul-17	18-Mar-16	17-Jun-16	13-Jul-17	14-Mar-16	17-Jun-16	13-Jul-17	17-Mar-16	8-Jun-16	4-Feb-17	17-Mar-16	18-Jun-16	14-Mar-16
QA/QC				FDA	FD	FDA	FD																				FDA	FD	
Dissolved Arsenic	0.00051	0.00091	0.0004	0.00098	0.00091	0.00035	0.00033	0.00275	0.00499	0.00204	0.00367	0.0062	0.0009	0.00982	0.0005	0.00543	0.00285	**0.0112**	0.00279	0.0021	0.0047	0.00251	0.0014	0.00044	0.00046	< 0.00010	0.00127	0.0004	
Dissolved Barium	**3.67**	0.0511	0.0461	0.0539	0.0503	0.0617	0.0606	0.0533	0.0363	0.178	0.0707	**8.25**	**5.92**	**9.71**	**11.2**	0.0388	0.0805	0.161	0.097	0.241	0.289	0.301	0.295	**4.37**	**4.54**	**3.71**	**9.39**	**10.2**	
Dissolved Cobalt	< 0.00050	**0.00622**	**0.00535**	**0.00152**	**0.00156**	< 0.00050	< 0.00050	**0.0234**	**0.0143**	**0.0107**	**0.0114**	**0.00127**	**0.00396**	**0.00168**	0.00015	**0.00118**	< 0.00050	**0.00599**	**0.00435**	**0.00281**	**0.00183**	**0.00123**	**0.00106**	< 0.00050	< 0.00050	< 0.00050	**0.00253**	**0.00175**	
Dissolved Lead	< 0.00020	< 0.00020	<0.00005	< 0.00020	< 0.00020	< 0.00020	0.0004	<0.0002	< 0.00020	0.00056	<0.00005	< 0.00020	< 0.00020	0.00031	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	<0.00005	< 0.00020	< 0.00020	<0.00005	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020
Dissolved Nickel	< 0.0010	0.0165	0.0109	0.0035	0.0034	< 0.0010	< 0.0010	0.0477	0.0283	0.024	0.0215	0.0061	0.0058	0.0032	0.0003	0.0021	< 0.0010	0.0116	0.0089	0.0058	0.0041	0.0028	0.0022	< 0.0010	< 0.0010	< 0.0010	0.0059	0.0044	
Dissolved Selenium	< 0.00010	0.00067	0.0014	0.00034	0.00019	< 0.00010	< 0.00010	0.0033	0.00038	0.00124	0.00042	<0.0005	0.0004	< 0.00010	0.001	< 0.00010	< 0.00010	0.00031	< 0.00010	0.0007	0.00013	< 0.00010	<0.0005	0.00015	< 0.00010	< 0.00010	0.0003	0.00019	
Dissolved Strontium	0.265	0.29	0.389	0.676	0.672	0.562	0.56	1.57	0.9	0.179	0.266	0.157	1.01	1.08	1.36	0.371	0.365	0.134	0.128	0.154	0.18	0.176	0.15	0.38	0.374	0.333	0.635	0.659	
Dissolved Thallium	< 0.000050	< 0.000050	<0.000001	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.000001	< 0.000050	< 0.000050	<0.000001	< 0.000050	< 0.000050	<0.000001	< 0.000050	< 0.000050	<0.000001	< 0.000050	<0.000001	< 0.000050	<0.000001	< 0.000050	<0.000001	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050
Dissolved Uranium	< 0.00010	0.00308	0.00183	0.00029	0.00026	< 0.00010	< 0.00010	**0.0298**	0.0174	0.0004	0.00309	0.00118	0.00126	0.00018	0.00003	0.00018	< 0.00010	0.00011	0.00227	0.00049	0.00024	< 0.00010	0.00001	< 0.00010	< 0.00010	< 0.00010	0.00018	0.00018	
Dissolved Zinc	0.0065	0.0073	0.002	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.0324	0.0126	0.01	0.0126	0.003	0.0062	0.0106	0.007	< 0.0050	< 0.0050	0.0101	0.0078	0.004	< 0.0050	0.0069	< 0.0050	<0.002	0.0061	0.0065	< 0.0050	0.0122	0.0127

Parameter	CSR DW Standard	CSR AW-F Standard
Dissolved Arsenic	**0.01**	**0.05**
Dissolved Barium	**1**	**10**
Dissolved Cobalt	**0.001**	**0.04**
Dissolved Lead	**0.01**	**0.04**
Dissolved Nickel	**0.08**	**0.25**
Dissolved Selenium	**0.01**	**0.02**
Dissolved Strontium	**2.5**	
Dissolved Thallium		**0.003**
Dissolved Uranium	**0.02**	**0.085**
Dissolved Zinc	**3**	**0.075 - 2.4**

Location	K19-MW16-14	K19-MW16-14	K19-MW16-15	K19-MW16-15	K19 DW WELL	K19 DW WELL	K19-MW17-01D	K19-MW17-02	K19-MW17-05	K19-MW17-06	K19-MW17-07	K19-MW17-11	K19-MW17-01D	K19-MW17-01S	K19-MW17-02	K19-MW17-06	K19-MW17-07	K19-MW17-09	K19-MW17-10	K19-MW17-17	K19-MW17-23	K19-MW17-24	K19-MW17-24	K19-MW17-26	K19-MW17-29D	K19-MW17-29S	K19-MW17-33	K19-MW17-35S
Date Sampled	9-Feb-17	15-Jul-17	17-Mar-16	13-Jun-16	15-Jun-16	15-Jun-16	5-Feb-17	5-Feb-17	5-Feb-17	6-Feb-17	7-Feb-17	15-Jul-17	23-Jul-17	23-Jul-17	15-Jul-17	20-Jul-17	20-Jul-17	25-Jul-17	25-Jul-17	26-Jul-17	28-Jul-17	26-Jul-17	26-Jul-17	30-Jul-17	28-Jul-17	30-Jul-17	28-Jul-17	30-Jul-17	30-Jul-17
QA/QC					FD	FDA																	FDA	FD				
Dissolved Arsenic	0.00058	0.0005	0.00062	0.00092	0.00054	0.00052	0.0002	0.00043	<0.0001	<0.001	0.00017	0.00027	0.0007	**0.012**	0.0009	0.0004	0.0002	0.0005	0.0004	0.0011	0.0003	0.0004	0.0004	0.0002	0.0003	0.0009	0.0024	0.0005
Dissolved Barium	**8.89**	**5.2**	0.135	0.0947	0.128	0.126	**6.32**	**6.18**	**1.18**	**13**	0.149	0.231	**5.74**	0.96	**5.19**	**12.8**	0.109	0.0518	**3.63**	**3.24**	**3.1**	**1.22**	**2.84**	**1.93**	0.0859	**8.02**	0.521	0.115	0.0893
Dissolved Cobalt	<0.002	0.00098	**0.00825**	**0.00313**	0.00073	0.00075	**0.00411**	**0.00134**	**0.00236**	<0.005	**0.00169**	**0.00108**	0.00026	**0.00114**	**0.00235**	0.00037	**0.00151**	**0.00318**	**0.0102**	**0.00198**	0.00026	0.00041	0.00035	**0.00108**	0.00046	**0.0173**	**0.00172**	**0.00312**	
Dissolved Lead	<0.0008	<0.00005	< 0.00020	< 0.00020	0.00057	0.00058	<0.0002	<0.0002	<0.0002	<0.002	<0.0002	0.0002	<0.00005	0.00005	<0.00005	0.00015	<0.00005	<0.00005	0.00007	<0.00005	0.0002	<0.00005	<0.00005	0.00011	<0.00005	0.00006	<0.00005	0.00006
Dissolved Nickel	<0.004	0.0039	0.0136	0.007	0.006	0.006	0.0071	0.0013	0.0018	<0.01	0.0019	0.0039	0.0005	0.0022	0.0006	0.0006	0.0014	0.0103	0.0185	0.0055	0.001	0.0017	0.0014	0.0022	0.0013	0.019	0.0025	0.0114	
Dissolved Selenium	<0.0004	0.0007	0.0003	< 0.00010	< 0.00010	< 0.00010	0.00024	<0.0001	<0.0001	<0.001	<0.0001	0.0023	0.0006	<0.0005	<0.0005	0.0007	0.0023	0.0006	<0.0005	**0.0116**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0008	<0.0005	<0.0005	
Dissolved Strontium	0.603	0.625	0.631	0.585	0.0164	0.016	0.56	0.49	2.4	1.33	0.732	0.195	0.498	0.836	0.467	1.83	0.95	0.686	2.0	0.588	0.545	0.55	0.492	0.745	1.05	0.92	0.228	0.0502	
Dissolved Thallium	<0.00004	<0.00001	< 0.000050	< 0.000050	< 0.000050	< 0.000050	**0.000013**	<0.00001	<0.00001	<0.00001	**0.000014**	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	**0.00002**	**0.00001**	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	**0.00003**	<0.00001	<0.00001	
Dissolved Uranium	<0.0004	0.00008	0.0011	0.00041	0.00014	0.00013	0.00217	0.00065	0.00021	0.0014	0.00214	0.00041	0.00007	0.00155	0.00111	0.00033	0.00036	0.00429	0.00057	0.00285	0.00051	0.0004	0.00038	0.00018	0.00036	0.00575	0.00048	0.00016	
Dissolved Zinc	0.02	0.011	0.0102	0.0079	**0.109**	**0.109**	0.0094	0.0095	0.0104	<0.05	<0.005	<0.005	0.004	0.002	0.003	0.012	0.006	0.003	0.024	<0.002	0.003	<0.002	<0.002	0.002	0.004	0.014	0.005	0.008	

LEGEND

- SURFACE SAMPLE
- DW WELL
- BOREHOLE
- MONITORING WELL
- TEST PIT
- SEDIMENT SAMPLE
- HAND DUG SURFACE SOIL SAMPLE
- HAND AUGER
- SURFACE WATER
- WOODEN CULVERT
- CONTOUR (10m)
- SECONDARY ROAD
- APPROXIMATE SEASONAL SWALE / DRAINAGE DITCH
- WATERCOURSE
- INFERRED UNDERGROUND WATERCOURSE
- INFERRED GROUNDWATER FLOW DIRECTION
- APPROXIMATE WETLAND
- ALASKA HIGHWAY FORMER ALIGNMENT
- APPROXIMATE LOCATION OF AREA OF POTENTIAL ENVIRONMENTAL CONCERN DEFINED BY GOLDER IN
- APPROXIMATE LOCATION OF AREA OF POTENTIAL ENVIRONMENTAL CONCERN DEFINED BY GOLDER IN
- APPROXIMATE LOCATION OF HISTORICAL BUILDINGS
- SITE LOCATION
- REVISED AEC BOUNDARY BASED ON ESTIMATED EXTENT OF PETROLEUM HYDROCARBON CONTAMINATION
- WOOD DEBRIS PILE

GROUNDWATER AND SURFACE WATER CHEMISTRY RESULTS - DISSOLVED METALS (EXCLUDING LITHIUM)

ONE OR MORE PARAMETERS ANALYZED EXCEED THE MOST CONSERVATIVE CSR STANDARD FOR DRINKING WATER AND/OR FRESHWATER AQUATIC LIFE FOR GROUNDWATER OR THE BCWQG FRESHWATER MAXIMUM AND/OR BCWQG FRESHWATER 30 DAY STANDARD FOR SURFACE WATER IN THE JULY 2017 OR ANY HISTORIC SAMPLING EVENT

PARAMETERS ANALYZED MET THE MOST CONSERVATIVE CSR STANDARDS FOR DRINKING WATER AND/OR FRESHWATER AQUATIC FOR GROUNDWATER OR THE BCWQG FRESHWATER MAXIMUM AND/OR BCWQG FRESHWATER 30 DAY STANDARD FOR SURFACE WATER IN THE JULY 2017 OR ANY HISTORIC SAMPLING EVENT

REFERENCES

1. CONTOURS OBTAINED FROM ARCADIS.
2. DW WELL, CULVERT, APPROXIMATE WETLAND AND APPROXIMATE SWALE/DRAINAGE DITCH OBTAINED FROM GOLDER ASSOCIATES LTD.
3. MONITORING WELLS OBTAINED FROM ARCADIS, VECTOR GEOMATICS, AND GOLDER ASSOCIATES LTD.
4. ALASKA HIGHWAY FORMER ALIGNMENT AND SECONDARY ROADS OBTAINED BY ARCADIS, PORTIONS DERIVED BY VECTOR GEOMATICS, FEBRUARY 7 TH AND 8 TH, 2017.
5. WATERCOURSES OBTAINED BY B.C. MINISTRY OF FORESTS, LAND AND NATURAL RESOURCE OPERATIONS.
6. IMAGERY OBTAINED FROM BING MAPS FOR ARCGIS PUBLISHED BY MICROSOFT CORPORATION, REDMOND, WA, MAY 2009.
7. PROJECTION: UTM ZONE 10N DATUM: WGS84

NOTES

1. ALL PARAMETER UNITS IN MILLIGRAMS PER LITRE (MG/L), UNLESS OTHERWISE NOTED; M = METRES; BGS = BELOW GROUND SURFACE.
STANDARDS SHOWN ARE FROM THE CONTAMINATED SITES REGULATION (CSR), ENACTED IN 1997, AND UPDATED PERIODICALLY.
LAND-USE ABBREVIATIONS (CSR): PL (URBAN PARK LAND); RL (RESIDENTIAL); CL (COMMERCIAL)
QA/QC = QUALITY ASSURANCE, QUALITY CONTROL.
FDA = FIELD DUPLICATE AVAILABLE; FD = FIELD DUPLICATE.
2. LOCATIONS WHERE NO SAMPLES WERE ANALYSED ARE COLORED BLACK AND ARE NOT HIGHLIGHTED GREEN OR RED.
3. APEC SHOWN FOR ILLUSTRATIVE PURPOSES.

CLIENT
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

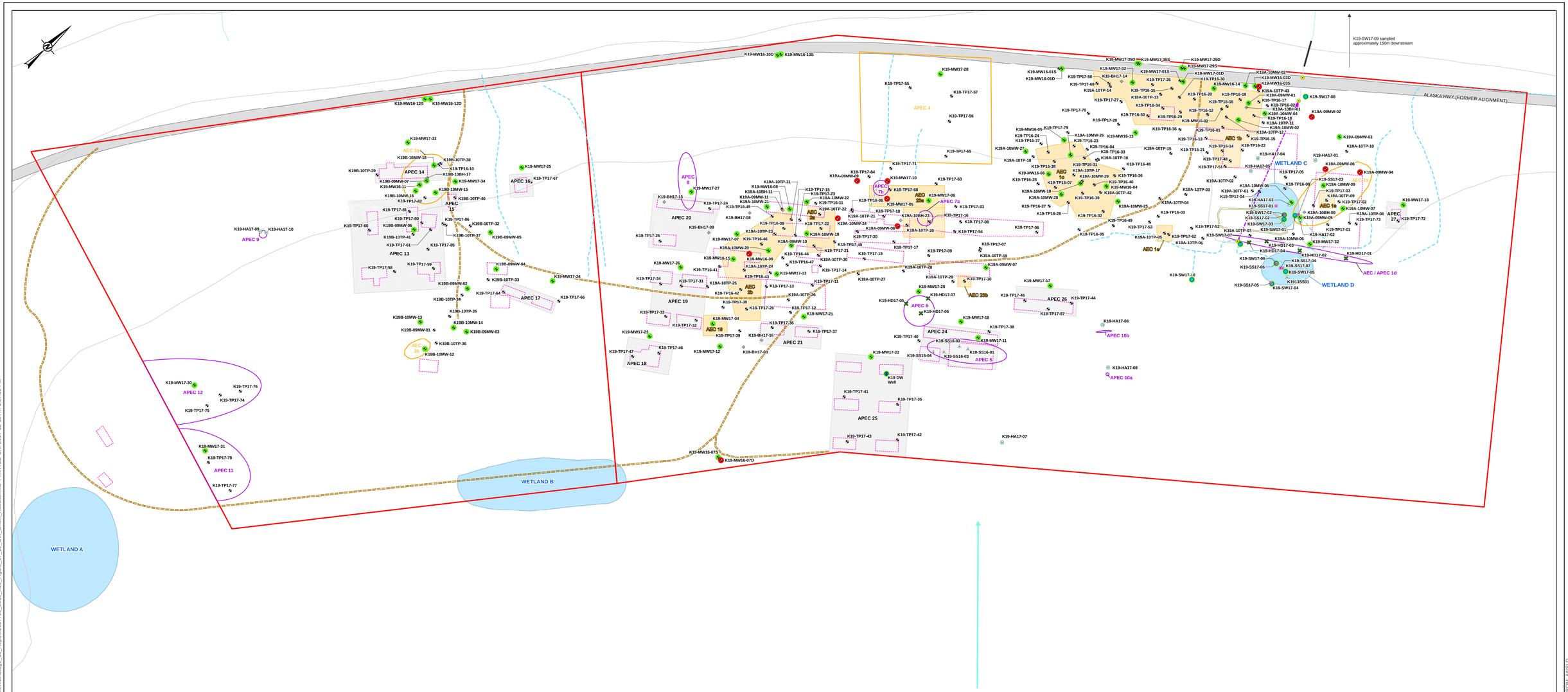
CONSULTANT
Golder Associates

YYYY-MM-DD	2017-12-15
DESIGNED	KDB
PREPARED	RC
REVIEWED	
APPROVED	

PROJECT
K-19 TRUTCH FORMER TOWNSITE
ALASKA HIGHWAY, B.C.

TITLE
GROUNDWATER AND SURFACE WATER CHEMISTRY RESULTS DISSOLVED METALS (EXCLUDING LITHIUM)

PROJECT NO.	CONTROL	REV.	FIGURE
1667709	5000	A



Parameter	CSR DW Standard	CSR AW-F Standard
Chloride	250	1500
Sodium	200	-

Location	K19A-09MW-02	K19A-09MW-02	K19A-09MW-02	K19A-09MW-04	K19A-09MW-06	K19A-09MW-06	K19-09MW-06	K19-09MW-06	K19A-09MW-08	K19A-09MW-09	K19A-09MW-09	K19A-10MW-24	K19A-10MW-24	K19A-10MW-24	K19-MW16-03S	K19-MW16-07D	K19-MW16-07D	K19-MW16-09	K19-MW16-09	K19-MW17-05	K19-MW17-05	K19-MW17-10
Date Sampled	8-Jun-16	9-Feb-17	16-Jul-17	7-Jun-16	8-Feb-17	16-Jul-17	16-Jul-17	16-Jun-16	13-Jun-16	16-Jun-16	8-Feb-17	6-Feb-17	6-Feb-17	21-Jul-17	17-Jun-16	14-Mar-16	18-Jun-16	18-Jun-16	5-Feb-17	5-Feb-17	27-Jul-17	25-Jul-17
QA/QC												FDA	FD									
Chloride	780	760	696	270	2400	2800	2720	2720	690	1200	1100	480	480	414	630	-	-	87	23	1200	1190	1050
Sodium	66.7	64.5	62	9.94	410	467	452	460	28.4	23.6	23	17.3	16.4	14.7	70.4	220	179	345	248	25.5	26.8	41

LEGEND

- SURFACE SAMPLE
- DW WELL
- BOREHOLE
- MONITORING WELL
- TEST PIT
- SEDIMENT SAMPLE
- HAND DUG SURFACE SOIL SAMPLE
- HAND AUGER
- SURFACE WATER
- WOODEN CULVERT
- CONTOUR (10m)
- SECONDARY ROAD
- APPROXIMATE SEASONAL SWALE / DRAINAGE DITCH
- WATERCOURSE
- INFERRED UNDERGROUND WATERCOURSE
- INFERRED GROUNDWATER FLOW DIRECTION
- APPROXIMATE WETLAND
- ALASKA HIGHWAY FORMER ALIGNMENT
- APPROXIMATE LOCATION OF AREA OF POTENTIAL ENVIRONMENTAL CONCERN DEFINED BY GOLDER IN
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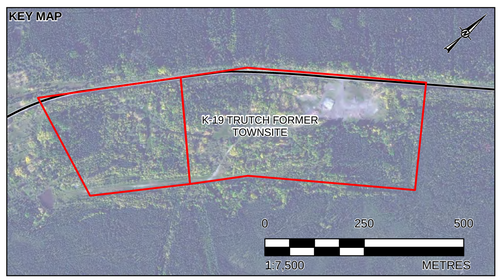
- SITE LOCATION
- REVISED AEC BOUNDARY BASED ON ESTIMATED EXTENT OF PETROLEUM HYDROCARBON CONTAMINATION
- WOOD DEBRIS PILE

GROUNDWATER AND SURFACE WATER CHEMISTRY RESULTS - CHLORIDE ION AND DISSOLVED SODIUM

- ONE OR MORE PARAMETERS ANALYZED EXCEED THE MOST CONSERVATIVE CSR STANDARD FOR DRINKING WATER AND/OR FRESHWATER AQUATIC LIFE FOR GROUNDWATER OR THE BCWQG FRESHWATER MAXIMUM AND/OR BCWQG FRESHWATER 30 DAY STANDARD FOR SURFACE WATER IN THE JULY 2017 OR ANY HISTORIC SAMPLING EVENT
- PARAMETERS ANALYZED MET THE MOST CONSERVATIVE CSR STANDARDS FOR DRINKING WATER AND/OR FRESHWATER AQUATIC FOR GROUNDWATER OR THE BCWQG FRESHWATER MAXIMUM AND/OR BCWQG FRESHWATER 30 DAY STANDARD FOR SURFACE WATER IN THE JULY 2017 OR ANY HISTORIC SAMPLING EVENT



0 50 100
1:1,250 METRES

DRAFT

REFERENCES
1. CONTOURS OBTAINED FROM ARCADIS.
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7. PROJECTION: UTM ZONE 10N DATUM: WGS84

NOTES
1. ALL PARAMETER UNITS IN MILLIGRAMS PER LITRE (MG/L), UNLESS OTHERWISE NOTED; M = METRES; BGS = BELOW GROUND SURFACE.
STANDARDS SHOWN ARE FROM THE CONTAMINATED SITES REGULATION (CSR), ENACTED IN 1997, AND UPDATED PERIODICALLY.
LAND-USE ABBREVIATIONS (CSR): PL (URBAN PARK LAND); RL (RESIDENTIAL); CL (COMMERCIAL)
QA/QC = QUALITY ASSURANCE, QUALITY CONTROL.
FDA = FIELD DUPLICATE AVAILABLE; FD = FIELD DUPLICATE.
2. LOCATIONS WHERE NO SAMPLES WERE ANALYSED ARE COLORED BLACK AND ARE NOT HIGHLIGHTED GREEN OR RED.
3. APEC SHOWN FOR ILLUSTRATIVE PURPOSES.

CLIENT
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-12-15
DESIGNED	KDB
PREPARED	RC
REVIEWED	
APPROVED	

PROJECT
K-19 TRUTCH FORMER TOWNSITE
ALASKA HIGHWAY, B.C.

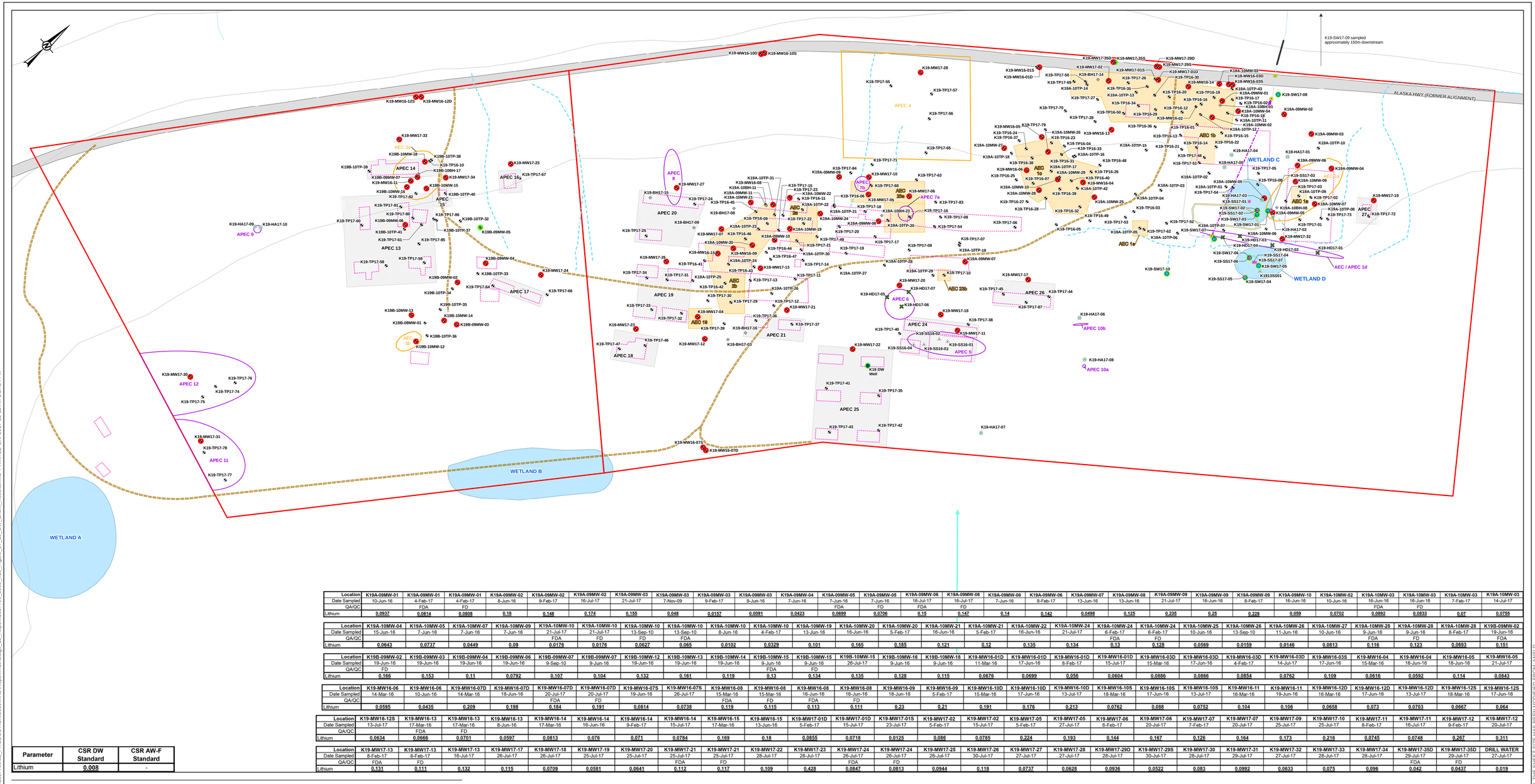
TITLE
GROUNDWATER AND SURFACE WATER CHEMISTRY RESULTS CHLORIDE ION AND DISSOLVED SODIUM

PROJECT NO.	CONTROL	REV.	FIGURE
1667709	5000	A	8

PATH: \\golder.gds\gal\burnaby\CAD-GIS\Client\PWGSC\Alaska_Highway\99_PROJECTS\1657709\02_PRODUCTION\5000\MXD\Report\k19\Stage_10_Report\1657709_5000_K19_Figure_07_10_GW_Chem_Results.mxd PRINTED ON: 2017-12-15 AT: 1:37:10 PM

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI D

0 25mm


K19-SW17-09 sampled approximately 150m downstream
ALASKA HWY (FORMER ALIGNMENT)
APEC 4
APEC 8
APEC 20
APEC 19
APEC 18
APEC 21
APEC 25
APEC 24
APEC 26
APEC 14
APEC 15
APEC 13
APEC 16
APEC 17
APEC 9
APEC 12
APEC 11
APEC 10a
APEC 10b
APEC 1a
APEC 1b
APEC 1c
APEC 1d
APEC 2a
APEC 2b
APEC 2c
APEC 3a
APEC 3b
APEC 5
APEC 6
APEC 7a
APEC 7b
APEC 27
WETLAND A
WETLAND B
WETLAND C
WETLAND D
K19 DW Well
K19-SW17-08
K19-SW17-10
K19-SW17-09
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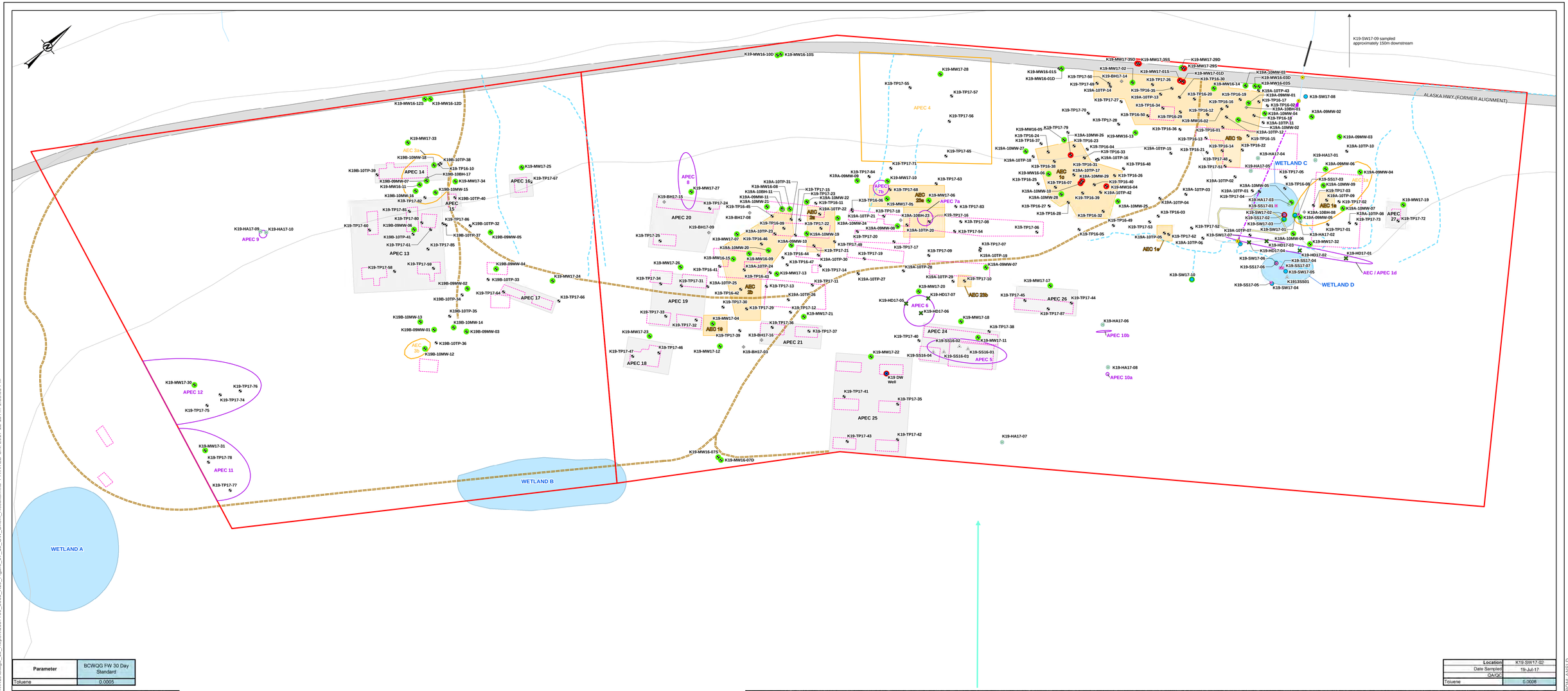

Parameter	BCWQG FW 30 Day Standard
Toluene	0.0005

Parameter	CSR DW Standard	CSR AW-F Standard
Benzene	**0.005**	**0.4**
Toluene	**0.06**	**0.005**
Xylenes	**0.09**	**0.3**
LEPH	-	**0.5**
VPH (C6-C10)	-	**1.5**
Benzo(a)pyrene	**0.00001**	**0.0001**
Benzo(b,j) fluoranthene	**0.00007**	-
Naphthalene	**0.08**	**0.01**
Pyrene	**0.1**	**0.0002**
Quinoline	**0.00005**	**0.034**
1-Methylnaphthalene	**0.0055**	-
2-methylnaphthalene	**0.015**	-

Location	K19-SW17-02
Date Sampled	19-Jul-17
QA/QC	FD
Toluene	0.0008

Location	K19A-10MW-10	K19A-10MW-10	K19A-10MW-10	K19A-10MW-10	K19A-10MW-26	K19A-10MW-26	K19A-10MW-29	K19A-10MW-29	K19-MW16-04	K19-MW16-04	K19 DW WELL	K19 DW WELL	K19-MW17-01D	K19-MW17-01S	K19-MW17-29S	K19-MW17-35D	K19-MW17-35D
Date Sampled	13-Sep-10	13-Sep-10	8-Jun-16	4-Feb-17	13-Sep-10	11-Jun-16	9-Jun-16	10-Jun-16	15-Mar-16	16-Jun-16	15-Jun-16	15-Jun-16	5-Feb-17	23-Jul-17	30-Jul-17	29-Jul-17	29-Jul-17
QA/QC	FD	FDA	-	-	-	-	-	-	-	-	FD	FDA	-	-	-	-	-
Benzene	<0.0017	0.0012	0.00072	0.0017	**0.007**	0.0019	-	**0.006**	**0.0083**	**0.0097**	< 0.00040	< 0.00040	-	**1.9**	**0.0538**	**0.574**	**0.569**
Toluene	0.00049	<0.0005	< 0.00040	<0.0004	0.0017	0.00055		0.00077	0.0028	0.0019	< 0.00040	< 0.00040	-	**0.138**	0.0016	**0.02**	**0.0202**
Xylenes	0.016	0.0098	0.001	0.0043	0.0081	0.0015		0.00057	**0.024**	0.015	< 0.00040	< 0.00040	-	**0.146**	0.006	0.001	0.001
LEPH	0.088	0.43	**2.7**	<0.2	0.2	< 0.20	**1.2**	-	**0.64**	**0.57**	< 0.20	< 0.20	0.3	**1.51**	**0.65**	<0.1	<0.1
VPH (C6-C10)	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	-	<0.3	<0.3	<0.3	<0.3	-	**2.72**	0.17	<0.1	<0.1
Benzo(a)pyrene	<0.00001	<0.00001	< 0.0000090	<0.000009	<0.00001	< 0.0000090	< 0.0000090	-	< 0.0000090	< 0.0000090	**0.000049**	**0.000054**	**0.000015**	<0.00001	<0.00001	<0.00001	<0.00001
Benzo(b,j) fluoranthene	<0.00001	<0.00001	< 0.00050	<0.00005	<0.00001	< 0.000050	< 0.000050	-	< 0.000050	< 0.000050	**0.00024**	**0.00024**	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001
Naphthalene	0.0021	0.0022	0.0004	0.0017	0.0091	0.0009	0.00015	-	**0.016**	0.0073	0.0021	0.0021	0.00046	**0.0155**	**0.0235**	<0.00005	<0.00005
Pyrene	<0.00001	<0.00001	< 0.000020	<0.00002	<0.00001	< 0.000020	< 0.000020	-	< 0.000020	< 0.000020	**0.00075**	**0.00074**	0.000081	<0.00002	<0.00002	<0.00004	<0.00004
Quinoline	<0.00009	<0.0001	< 0.00024	<0.00004	<0.0001	< 0.00024	< 0.00024	-	< 0.00057	**0.00036**	**0.00055**	**0.00056**	<0.00004	<0.0001	<0.0001	<0.00002	<0.00002
1-Methylnaphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.00732**	**0.0117**	<0.00005	<0.00005
2-methylnaphthalene	0.0037	0.0039	0.00015	0.0019	0.0039	0.00026	< 0.00010	-	**0.022**	**0.018**	0.00031	0.0003	0.00097	0.00215	0.00599	<0.00005	<0.00005

LEGEND

- SURFACE SAMPLE
- DW WELL
- BOREHOLE
- MONITORING WELL
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- SEDIMENT SAMPLE
- HAND DUG SURFACE SOIL SAMPLE
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GROUNDWATER AND SURFACE WATER CHEMISTRY RESULTS - PETROLEUM HYDROCARBONS, POLYCYCLIC AROMATIC HYDROCARBONS, BTEX AND VPH

- ONE OR MORE PARAMETERS ANALYZED EXCEED THE MOST CONSERVATIVE CSR STANDARD FOR DRINKING WATER AND/OR FRESHWATER AQUATIC LIFE FOR GROUNDWATER OR THE BCWQG FRESHWATER MAXIMUM AND/OR BCWQG FRESHWATER 30 DAY STANDARD FOR SURFACE WATER IN THE JULY 2017 OR ANY HISTORIC SAMPLING EVENT
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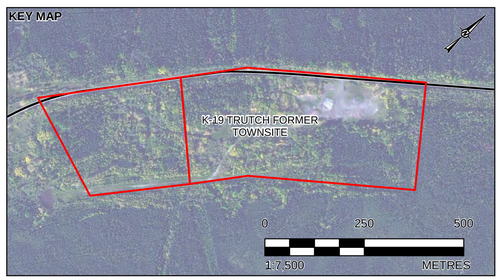

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7. PROJECTION: UTM ZONE 10N DATUM: WGS84

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3. APEC SHOWN FOR ILLUSTRATIVE PURPOSES.

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CONSULTANT
Golder Associates

YYYY-MM-DD	2017-12-15
DESIGNED	KDB
PREPARED	RC
REVIEWED	
APPROVED	

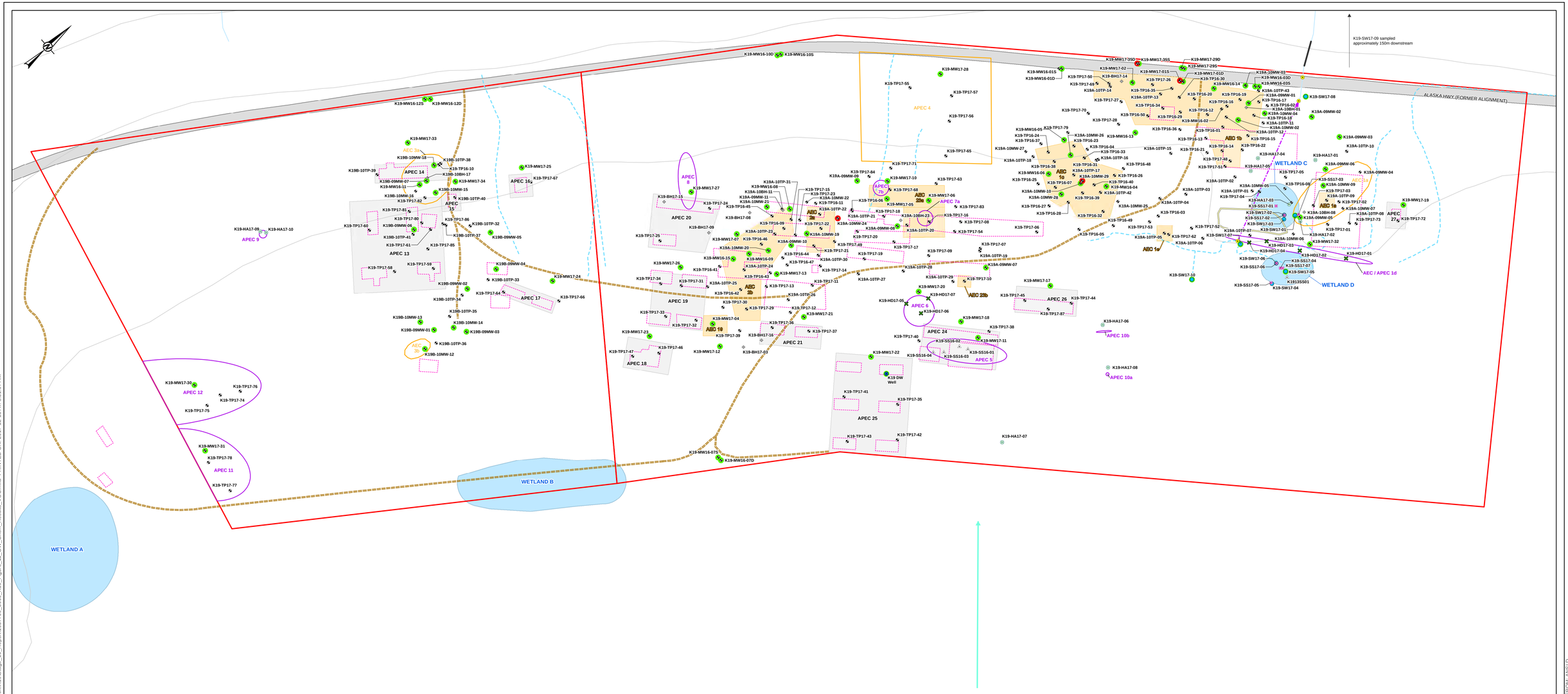
PROJECT
K-19 TRUTCH FORMER TOWNSITE
ALASKA HIGHWAY, B.C.

TITLE
GROUNDWATER AND SURFACE WATER CHEMISTRY RESULTS PETROLEUM HYDROCARBONS, POLYCYCLIC AROMATIC HYDROCARBONS, BTEX AND VPH

PROJECT NO.	CONTROL	REV.	FIGURE
1667709	5000	A	10

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI D
0 25mm

PATH: \\golder.gds\gal\burnaby\CAD-GIS\Client\PWGSC\Alaska_Highway\99_PROJECTS\1657709\02_PRODUCTION\5000\MXD\Report\k19\Stage_10_Report\1657709_5000_K19_Figure_07_10_GW_Chem_Results.mxd PRINTED ON: 2017-12-15 AT: 1:38:00 PM



Parameter	CSR DW Standard	CSR AW-F Standard
Dichloromethane	0.05	0.98
1,2-Dichloroethane	0.005	1
1,2-Dichloropropane	0.0045	-
1,1,2,2-Tetrachloroethane	0.0008	-

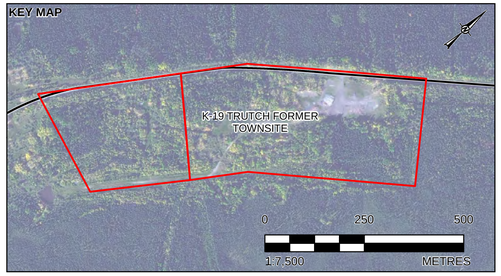
Location	K19A-10MW-24	K19-10MW-24	K19A-10MW-24	K19A-10MW-29	K19-MW17-01S	K19-MW17-35D	K19-MW17-35D
Date Sampled	6-Feb-17	6-Feb-17	21-Jul-17	10-Jun-16	23-Jul-17	29-Jul-17	29-Jul-17
QA/QC	FDA	FD				FDA	FD
Dichloromethane	0.13[1]	<0.002	<0.001	< 0.0020	<0.001	<0.001	<0.001
1,2-Dichloroethane	<0.0005	<0.0005	<0.001	0.026	0.274	0.121	0.122
1,2-Dichloropropane	<0.0005	<0.0005	<0.001	0.00055	0.045	0.002	0.002
1,1,2,2-Tetrachloroethane	<0.0005	<0.0005	*<0.001*	0.0045	*<0.001*	*<0.001*	*<0.001*

LEGEND

- SURFACE SAMPLE
- DW WELL
- BOREHOLE
- MONITORING WELL
- TEST PIT
- SEDIMENT SAMPLE
- HAND DUG SURFACE SOIL SAMPLE
- HAND AUGER
- SURFACE WATER
- WOODEN CULVERT
- CONTOUR (10m)
- SECONDARY ROAD
- APPROXIMATE SEASONAL SWALE / DRAINAGE DITCH
- WATERCOURSE
- INFERRED UNDERGROUND WATERCOURSE
- INFERRED GROUNDWATER FLOW DIRECTION
- APPROXIMATE WETLAND
- ALASKA HIGHWAY FORMER ALIGNMENT
- APPROXIMATE LOCATION OF AREA OF POTENTIAL ENVIRONMENTAL CONCERN DEFINED BY GOLDER IN
- APPROXIMATE LOCATION OF AREA OF POTENTIAL ENVIRONMENTAL CONCERN DEFINED BY GOLDER IN
- APPROXIMATE LOCATION OF HISTORICAL BUILDINGS
- SITE LOCATION
- REVISED AEC BOUNDARY BASED ON ESTIMATED EXTENT OF PETROLEUM HYDROCARBON CONTAMINATION
- WOOD DEBRIS PILE

GROUNDWATER AND SURFACE WATER CHEMISTRY RESULTS - VOLATILE ORGANIC COMPOUNDS

- ONE OR MORE PARAMETERS ANALYZED EXCEED THE MOST CONSERVATIVE CSR STANDARD FOR DRINKING WATER AND/OR FRESHWATER AQUATIC LIFE FOR GROUNDWATER OR THE BCWQG FRESHWATER MAXIMUM AND/OR BCWQG FRESHWATER 30 DAY STANDARD FOR SURFACE WATER IN THE JULY 2017 OR ANY HISTORIC SAMPLING EVENT
- PARAMETERS ANALYZED MET THE MOST CONSERVATIVE CSR STANDARDS FOR DRINKING WATER AND/OR FRESHWATER AQUATIC FOR GROUNDWATER OR THE BCWQG FRESHWATER MAXIMUM AND/OR BCWQG FRESHWATER 30 DAY STANDARD FOR SURFACE WATER IN THE JULY 2017 OR ANY HISTORIC SAMPLING EVENT



DRAFT

REFERENCES

1. CONTOURS OBTAINED FROM ARCADIS.
2. DW WELL, CULVERT, APPROXIMATE WETLAND AND APPROXIMATE SWALE/DRAINAGE DITCH OBTAINED FROM GOLDER ASSOCIATES LTD.
3. MONITORING WELLS OBTAINED FROM ARCADIS, VECTOR GEOMATICS, AND GOLDER ASSOCIATES LTD.
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5. WATERCOURSES OBTAINED BY B.C. MINISTRY OF FORESTS, LAND AND NATURAL RESOURCE OPERATIONS.
6. IMAGERY OBTAINED FROM BING MAPS FOR ARCGIS PUBLISHED BY MICROSOFT CORPORATION, REDMOND, WA, MAY 2009.
7. PROJECTION: UTM ZONE 10N DATUM: WGS84

NOTES

1. ALL PARAMETER UNITS IN MILLIGRAMS PER LITRE (MG/L), UNLESS OTHERWISE NOTED; M = METRES; BGS = BELOW GROUND SURFACE.
[1]SAMPLE RE-ANALYZED FOR DICHLOROMETHANE WAS PAST METHOD-SPECIFIED HOLD TIME. RE-ANALYSIS YIELDED A CONCENTRATON OF <0.002 MG/L.
STANDARDS SHOWN ARE FROM THE CONTAMINATED SITES REGULATION (CSR), ENACTED IN 1997, AND UPDATED PERIODICALLY.
LAND-USE ABBREVIATIONS (CSR): PL (URBAN PARK LAND); RL (RESIDENTIAL); CL (COMMERCIAL)
QA/QC = QUALITY ASSURANCE, QUALITY CONTROL.
FDA = FIELD DUPLICATE AVAILABLE; FD = FIELD DUPLICATE.
2. LOCATIONS WHERE NO SAMPLES WERE ANALYSED ARE COLORED BLACK AND ARE NOT HIGHLIGHTED GREEN OR RED.
3. APEC SHOWN FOR ILLUSTRATIVE PURPOSES.

CLIENT
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-12-15
DESIGNED	KDB
PREPARED	RC
REVIEWED	
APPROVED	

PROJECT
K-19 TRUTCH FORMER TOWNSITE
ALASKA HIGHWAY, B.C.

TITLE
GROUNDWATER AND SURFACE WATER CHEMISTRY RESULTS VOLATILE ORGANIC COMPOUNDS

PROJECT NO.	CONTROL	REV.	FIGURE
1667709	5000	A	11

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

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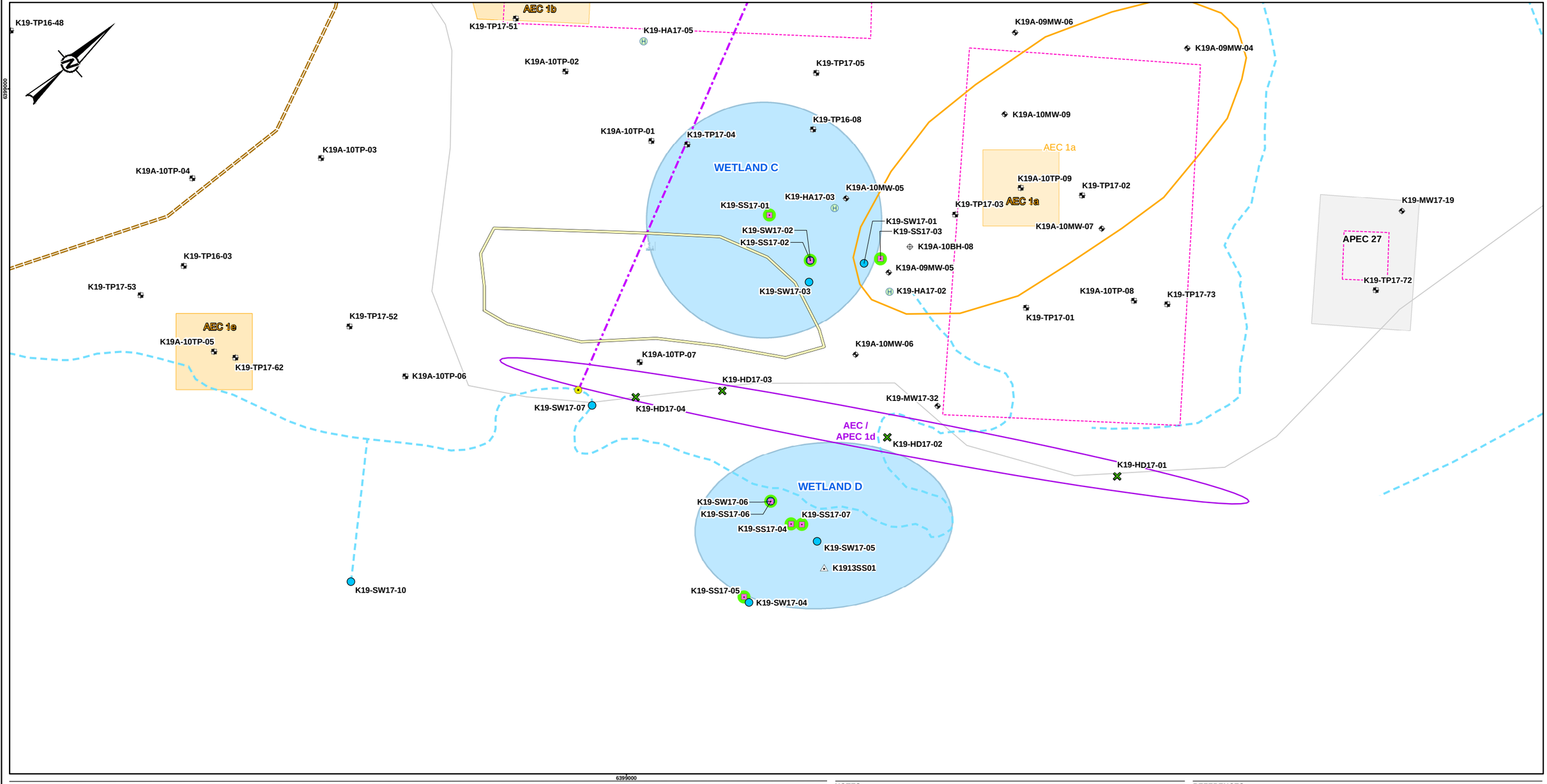
PATH: \\golder.gds\gal\burnaby\CAD-GIS\Client\PWGSC\Alaska_Highway\09_PROJECT\S1\1657709\02_PRODUCTION\5000\MXD\Report\K19\Stage_10_Report\1657709_5000_K19_Figure_11_GW_Chem_Results_VOC.mxd PRINTED ON: 2017-12-15 AT: 8:51:07 AM



6399000

LEGEND

- SURFACE SAMPLE
- BOREHOLE
- MONITORING WELL
- TEST PIT
- SEDIMENT SAMPLE
- HAND DUG SURFACE SOIL SAMPLE
- HAND AUGER
- SURFACE WATER
- WOODEN CULVERT
- CONTOUR (10M)
- SECONDARY ROAD
- APPROXIMATE SEASONAL SWALE / DRAINAGE DITCH
- INFERRED UNDERGROUND WATERCOURSE
- APPROXIMATE WETLAND
- APPROXIMATE LOCATION OF AREA OF POTENTIAL ENVIRONMENTAL CONCERN DEFINED BY GOLDER IN 2016 BASED ON FIELD OBSERVATIONS
- APPROXIMATE LOCATION OF AREA OF POTENTIAL ENVIRONMENTAL CONCERN DEFINED BY GOLDER IN 2016 BASED ON 1951 GATOR MAP
- APPROXIMATE LOCATION OF HISTORICAL BUILDINGS
- SITE LOCATION
- REVISED AEC BOUNDARY BASED ON ESTIMATED EXTENT OF PETROLEUM HYDROCARBON CONTAMINATION
- WOOD DEBRIS PILE

SEDIMENT CHEMISTRY RESULTS - TOTAL METALS

- PARAMETERS ANALYZED MET THE MOST CONSERVATIVE CSR STAGE 10 STANDARDS FOR FRESHWATER SEDIMENTS FOR TYPICAL AND/OR SENSITIVE USE

DRAFT

0 10 20

1:500 METRES

NOTES

1. CONTAMINATED MATERIAL EXCEEDS CONTAMINATED SITE REGULATION STANDARDS FOR PARKLAND AND/OR COMMERCIAL LAND USES, AS DEFINED IN THE SPECIFICATIONS.
2. BUILDINGS/INFRASTRUCTURE ARE AS OF FEBRUARY, 2017 AND ARE BASED ON GOLDER SITE OBSERVATIONS AND A SURVEY CONDUCTED BY VECTOR GEOMATICS LAND SURVEYING LTD.
3. FOR DETAILS REGARDING TEST HOLE GEOLOGY SEE APPENDICIES.
4. DRUMS/BURIED METAL DEBRIS POSSIBLE IN OTHER PORTIONS OF SITE.
5. ANY POTENTIAL GROUNDWATER ENCOUNTERED IN THE EXCAVATION, OR OTHER WATER THAT REQUIRES REMOVAL TO CARRY OUT THE INTENDED WORK, WILL BE COLLECTED AND MANAGED IN ACCORDANCE WITH THE APPLICABLE ENVIRONMENTAL LEGISLATION.
6. SUBSURFACE UTILITIES IDENTIFIED ON THIS FIGURE ARE APPROXIMATE AND BASED ON SURFACE FLAGGING AND THE LOCATION ABOVE GROUND UTILITY PEDESTALS. UTILITY LOCATION TO BE CONFIRMED BY CONTRACTOR PRIOR TO EXCAVATION.
7. TRICKLE FLOW WAS OBSERVED TO DAYLIGHT IN AN APPROXIMATELY 50 CM DIAMETER WOODEN CULVERT LOCATED ALONG THE NORTHWEST BOUNDARY OF THE SITE. THE EXTENT AND THE INLET OF THE WOODEN CULVERT WAS NOT IDENTIFIED.

REFERENCES

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2. DW WELL, CULVERT, APPROXIMATE WETLAND AND APPROXIMATE SWALE/DRAINAGE DITCH OBTAINED FROM GOLDER ASSOCIATES LTD.
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6. IMAGERY OBTAINED FROM BING MAPS FOR ARCGIS PUBLISHED BY MICROSOFT CORPORATION, REDMOND, WA, MAY 2009.
7. PROJECTION: UTM ZONE 10N DATUM: WGS84

CLIENT
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-11-21
DESIGNED	KO
PREPARED	RC
REVIEWED	
APPROVED	

PROJECT
K-19 TRUTCH FORMER TOWNSITE
ALASKA HIGHWAY, B.C.

TITLE
SEDIMENT CHEMISTRY RESULTS - TOTAL METALS

PROJECT NO.	CONTROL	REV.	FIGURE
1657709	5000	A	12

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

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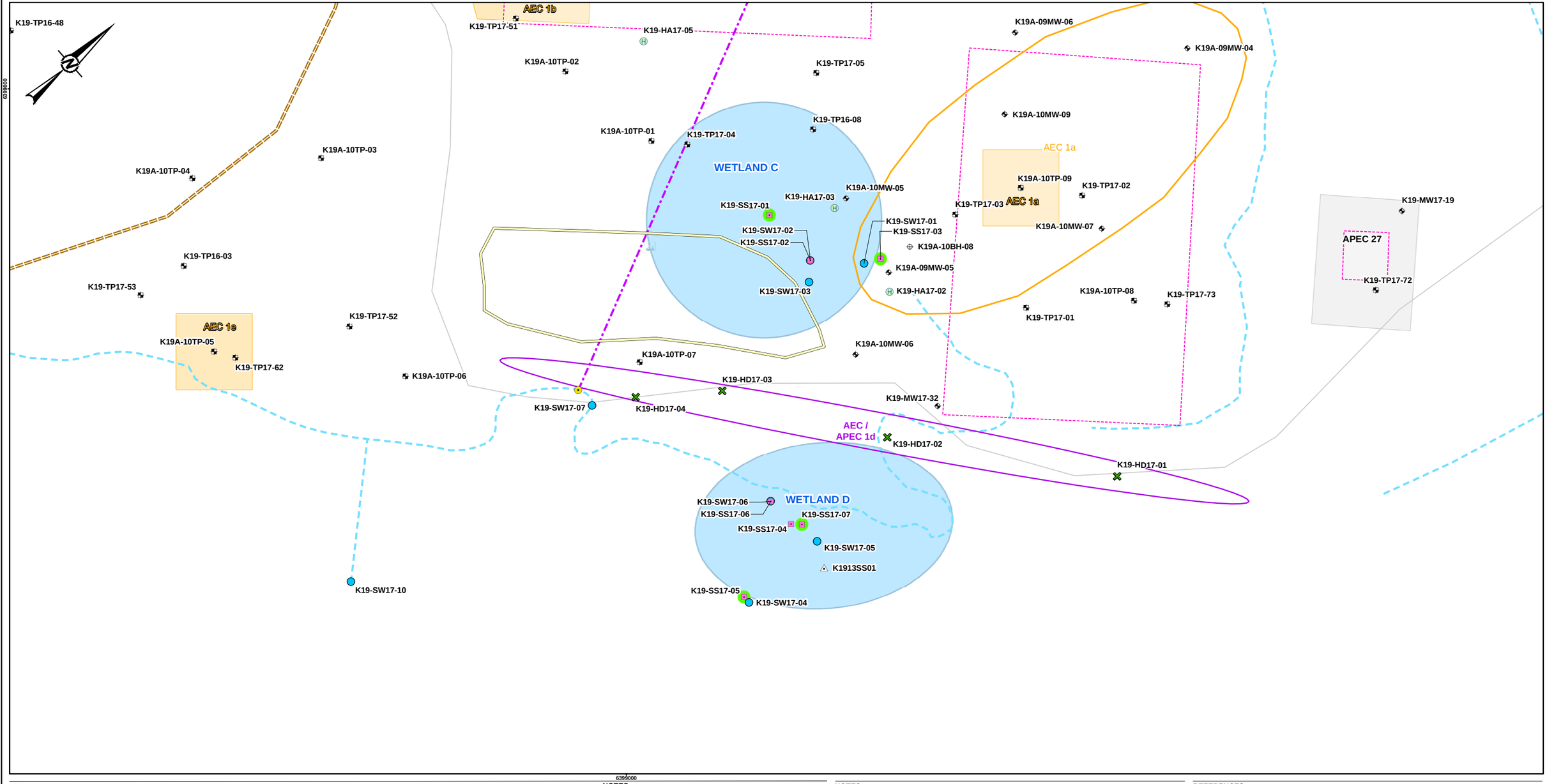

LEGEND

- SURFACE SAMPLE
- BOREHOLE
- MONITORING WELL
- TEST PIT
- SEDIMENT SAMPLE
- HAND DUG SURFACE SOIL SAMPLE
- HAND AUGER
- SURFACE WATER
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- APPROXIMATE LOCATION OF AREA OF POTENTIAL ENVIRONMENTAL CONCERN DEFINED BY GOLDER IN 2016 BASED ON 1951 GATOR MAP
- APPROXIMATE LOCATION OF HISTORICAL BUILDINGS
- SITE LOCATION
- REVISED AEC BOUNDARY BASED ON ESTIMATED EXTENT OF PETROLEUM HYDROCARBON CONTAMINATION
- WOOD DEBRIS PILE

SEDIMENT CHEMISTRY RESULTS - SODIUM AND CHLORIDE (SATURATED PASTE)

- PARAMETERS ANALYZED MET THE MOST CONSERVATIVE CSR STAGE 10 STANDARDS FOR FRESHWATER SEDIMENTS FOR TYPICAL AND/OR SENSITIVE USE

6399000

NOTES

1. BOLDED AND UNDERLINED TEXT INDICATES THAT THE CONCENTRATION EXCEEDS THE CSR STAGE 10 STANDARD WILDLANDS (REVERTED) LAND USE
2. BOLDED AND ORANGE SHADED TEXT INDICATES THAT THE CONCENTRATION EXCEEDS THE CSR STAGE 10 STANDARD FOR INDUSTRIAL LAND USE
3. ALL CONCENTRATIONS ARE EXPRESSED IN MILLIGRAMS PER KILOGRAM (MG/KG)
4. QAQC = QUALITY ASSURANCE QUALITY CONTROL; FDA = FIELD DUPLICATE AVAILABLE; FD = FIELD DUPLICATE

DRAFT

0 10 20

1:500 METRES

NOTES

1. CONTAMINATED MATERIAL EXCEEDS CONTAMINATED SITE REGULATION STANDARDS FOR PARKLAND AND/OR COMMERCIAL LAND USES, AS DEFINED IN THE SPECIFICATIONS.
2. BUILDINGS/INFRASTRUCTURE ARE AS OF FEBRUARY, 2017 AND ARE BASED ON GOLDER SITE OBSERVATIONS AND A SURVEY CONDUCTED BY VECTOR GEOMATICS LAND SURVEYING LTD.
3. FOR DETAILS REGARDING TEST HOLE GEOLOGY SEE APPENDICIES.
4. DRUMS/BURIED METAL DEBRIS POSSIBLE IN OTHER PORTIONS OF SITE.
5. ANY POTENTIAL GROUNDWATER ENCOUNTERED IN THE EXCAVATION, OR OTHER WATER THAT REQUIRES REMOVAL TO CARRY OUT THE INTENDED WORK, WILL BE COLLECTED AND MANAGED IN ACCORDANCE WITH THE APPLICABLE ENVIRONMENTAL LEGISLATION.
6. SUBSURFACE UTILITIES IDENTIFIED ON THIS FIGURE ARE APPROXIMATE AND BASED ON SURFACE FLAGGING AND THE LOCATION ABOVE GROUND UTILITY PEDESTALS. UTILITY LOCATION TO BE CONFIRMED BY CONTRACTOR PRIOR TO EXCAVATION.
7. TRICKLE FLOW WAS OBSERVED TO DAYLIGHT IN AN APPROXIMATELY 50 CM DIAMETER WOODEN CULVERT LOCATED ALONG THE NORTHWEST BOUNDARY OF THE SITE. THE EXTENT AND THE INLET OF THE WOODEN CULVERT WAS NOT IDENTIFIED.

REFERENCES

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7. PROJECTION: UTM ZONE 10N DATUM: WGS84

CLIENT
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-11-21
DESIGNED	KO
PREPARED	RC
REVIEWED	
APPROVED	

PROJECT
K-19 TRUTCH FORMER TOWNSITE
ALASKA HIGHWAY, B.C.

TITLE
SEDIMENT CHEMISTRY RESULTS - SODIUM AND CHLORIDE (SATURATED PASTE)

PROJECT NO.	CONTROL	REV.	FIGURE
1657709	5000	A	13

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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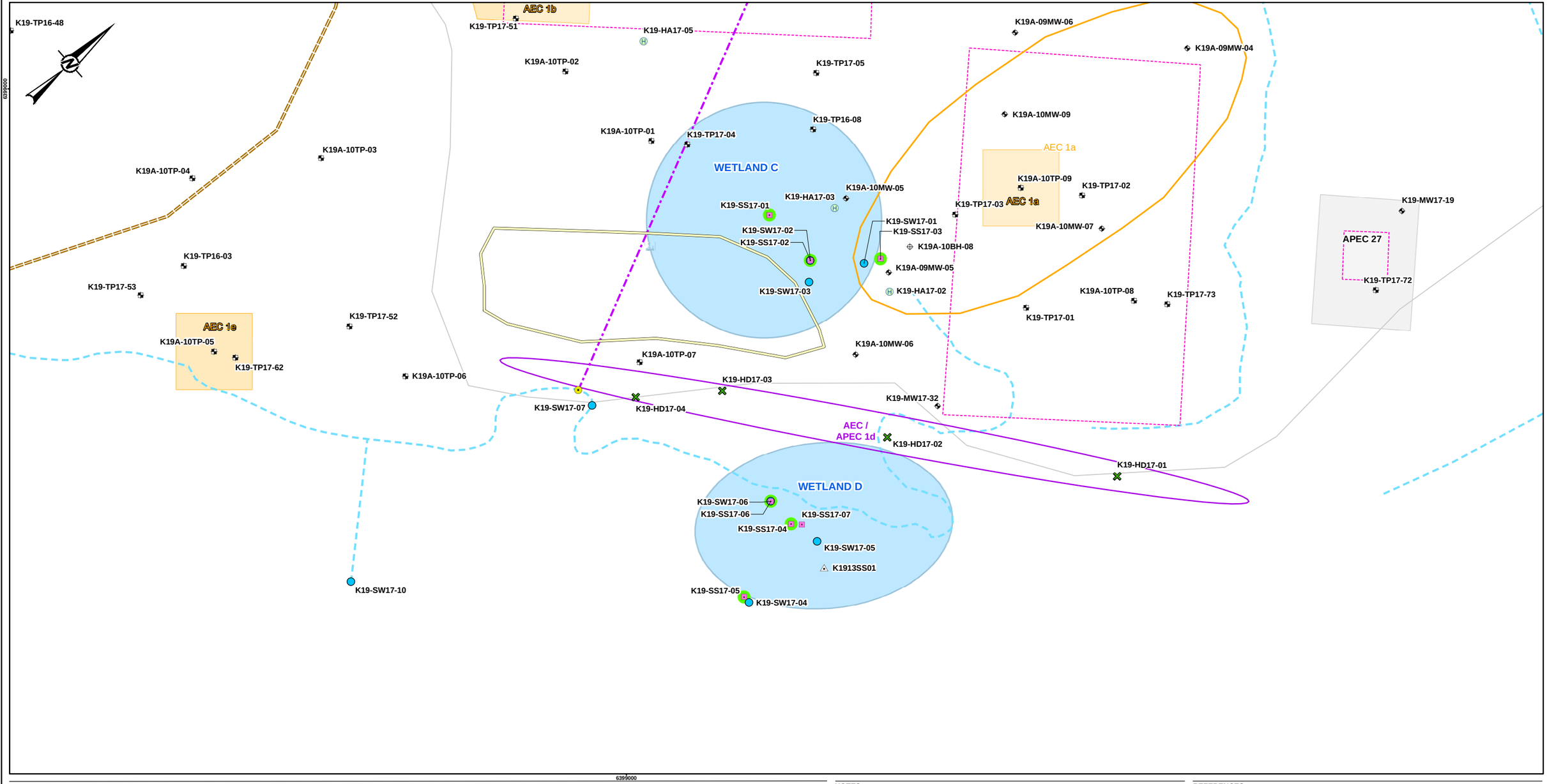
PATH: \\prj\dfs\gis\Burnaby\CAD-GIS\Client\PWGSC\Alaska_Highway\99_PROJECTS\1657709\02_PRODUCTION\5000\MXD\Report\K19\Stage_10_Report\1657709_5000_K19_Figure_12_15_Sediment_Chem_Results.mxd PRINTED ON: 2017-11-21 AT: 10:43:52 AM



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LEGEND

- SURFACE SAMPLE
- BOREHOLE
- MONITORING WELL
- TEST PIT
- SEDIMENT SAMPLE
- HAND DUG SURFACE SOIL SAMPLE
- HAND AUGER
- SURFACE WATER
- WOODEN CULVERT
- CONTOUR (10M)
- SECONDARY ROAD
- APPROXIMATE SEASONAL SWALE / DRAINAGE DITCH
- INFERRED UNDERGROUND WATERCOURSE
- APPROXIMATE WETLAND
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- APPROXIMATE LOCATION OF AREA OF POTENTIAL ENVIRONMENTAL CONCERN DEFINED BY GOLDER IN 2016 BASED ON 1951 GATOR MAP
- APPROXIMATE LOCATION OF HISTORICAL BUILDINGS
- SITE LOCATION
- REVISED AEC BOUNDARY BASED ON ESTIMATED EXTENT OF PETROLEUM HYDROCARBON CONTAMINATION
- WOOD DEBRIS PILE

SEDIMENT CHEMISTRY RESULTS - PETROLEUM HYDROCARBONS, POLYCYCLIC AROMATIC HYDROCARBONS, BTEX AND VPH

- PARAMETERS ANALYZED MET THE MOST CONSERVATIVE CSR STAGE 10 STANDARDS FOR FRESHWATER SEDIMENTS FOR TYPICAL AND/OR SENSITIVE USE

DRAFT

0 10 20

1:500 METRES

NOTES

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4. DRUMS/BURIED METAL DEBRIS POSSIBLE IN OTHER PORTIONS OF SITE.
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7. PROJECTION: UTM ZONE 10N DATUM: WGS84

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PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-11-21
DESIGNED	KO
PREPARED	RC
REVIEWED	
APPROVED	

PROJECT
K-19 TRUTCH FORMER TOWNSITE
ALASKA HIGHWAY, B.C.

TITLE
SEDIMENT CHEMISTRY RESULTS - PETROLEUM HYDROCARBONS, POLYCYCLIC AROMATIC HYDROCARBONS, BTEX AND VPH

PROJECT NO.	CONTROL	REV.	FIGURE
1657709	5000	A	14

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

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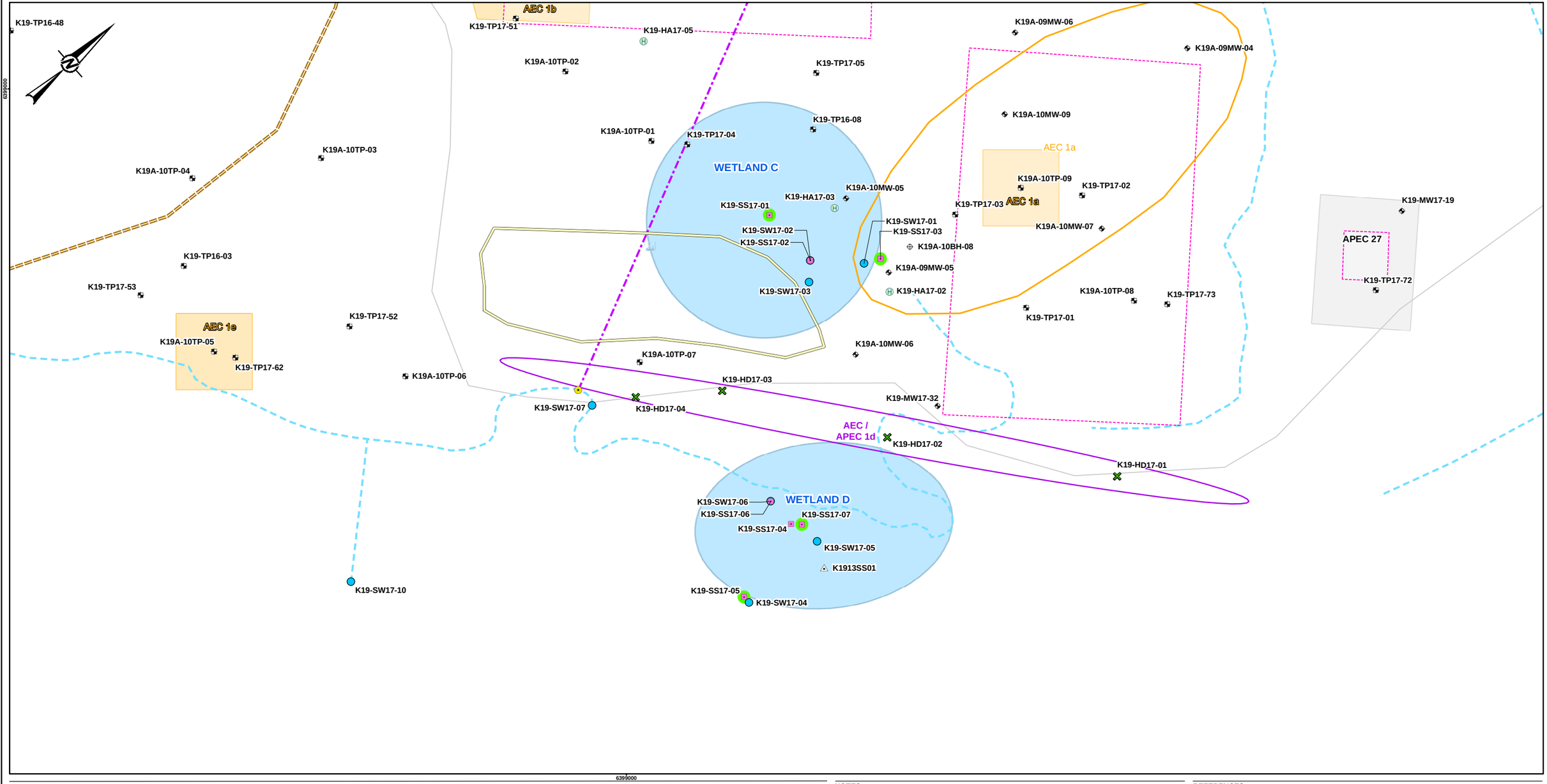

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LEGEND

- SURFACE SAMPLE
- BOREHOLE
- MONITORING WELL
- TEST PIT
- SEDIMENT SAMPLE
- HAND DUG SURFACE SOIL SAMPLE
- HAND AUGER
- SURFACE WATER
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- CONTOUR (10M)
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- REVISED AEC BOUNDARY BASED ON ESTIMATED EXTENT OF PETROLEUM HYDROCARBON CONTAMINATION
- WOOD DEBRIS PILE

SEDIMENT CHEMISTRY RESULTS - VOLATILE ORGANIC COMPOUNDS

- PARAMETERS ANALYZED MET THE MOST CONSERVATIVE CSR STAGE 10 STANDARDS FOR FRESHWATER SEDIMENTS FOR TYPICAL AND/OR SENSITIVE USE

DRAFT

0 10 20

1:500 METRES

NOTES

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7. TRICKLE FLOW WAS OBSERVED TO DAYLIGHT IN AN APPROXIMATELY 50 CM DIAMETER WOODEN CULVERT LOCATED ALONG THE NORTHWEST BOUNDARY OF THE SITE. THE EXTENT AND THE INLET OF THE WOODEN CULVERT WAS NOT IDENTIFIED.

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7. PROJECTION: UTM ZONE 10N DATUM: WGS84

CLIENT
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-11-21
DESIGNED	KO
PREPARED	RC
REVIEWED	
APPROVED	

PROJECT
K-19 TRUTCH FORMER TOWNSITE
ALASKA HIGHWAY, B.C.

TITLE
SEDIMENT CHEMISTRY RESULTS - VOLATILE ORGANIC COMPOUNDS

PROJECT NO.	CONTROL	REV.	FIGURE
1657709	5000	A	15

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

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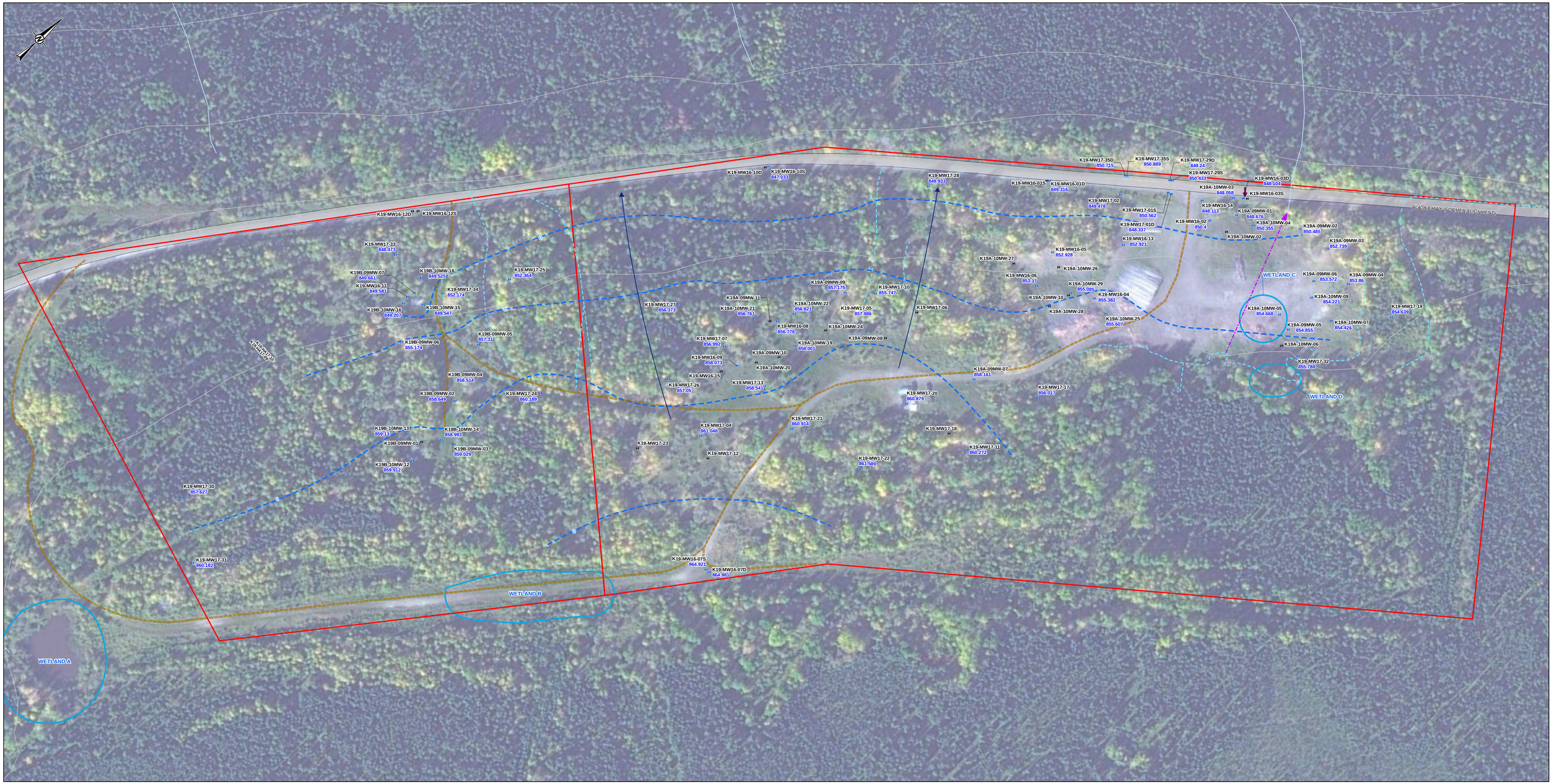
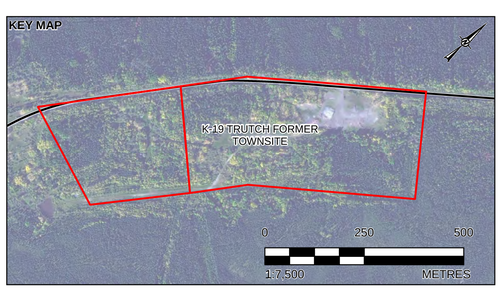


LEGEND

- MONITORING WELL (GROUNDWATER ELEVATION PROVIDED)
- MONITORING WELL (GROUNDWATER ELEVATION NOT PROVIDED)
- GROUNDWATER CONTOUR (m)
- INFERRED PERCHED CONDITIONS
- INFERRED GROUNDWATER FLOW DIRECTION
- CONTOUR (10m)
- SECONDARY ROAD
- APPROXIMATE SEASONAL SWALE / DRAINAGE DITCH
- WATERCOURSE
- INFERRED UNDERGROUND WATERCOURSE
- APPROXIMATE WETLAND
- ALASKA HIGHWAY FORMER ALIGNMENT
- SITE LOCATION



DRAFT

0 50 100
1:1,250 METRES

NOTES

1. **855.97** REPRESENTS GROUNDWATER ELEVATION IN METRES (MEASURED JULY, 12 TO 29, 2017).

REFERENCES

1. CONTOURS OBTAINED FROM ARCADIS.
2. MONITORING WELLS OBTAINED FROM ARCADIS, VECTOR GEOMATICS, AND GOLDER ASSOCIATES LTD.
3. ALASKA HIGHWAY FORMER ALIGNMENT AND SECONDARY ROADS OBTAINED BY ARCADIS, PORTIONS DERIVED BY VECTOR GEOMATICS, FEBRUARY 7TH AND 8TH, 2017.
4. WATERCOURSES OBTAINED BY B.C. MINISTRY OF FORESTS, LAND AND NATURAL RESOURCE OPERATIONS.
5. IMAGERY OBTAINED FROM BING MAPS FOR ARCGIS PUBLISHED BY MICROSOFT CORPORATION, REDMOND, WA, MAY 2009.
6. PROJECTION: UTM ZONE 10N DATUM: WGS84

CLIENT
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-10-12
DESIGNED	KDB
PREPARED	RC
REVIEWED	
APPROVED	

PROJECT
K-19 TRUTCH FORMER TOWNSITE
ALASKA HIGHWAY, B.C.

TITLE
GROUNDWATER ELEVATION AND FLOW DIRECTION IN BEDROCK, JULY 2017

PROJECT NO.	CONTROL	REV.	FIGURE
1667709	5000	A	16

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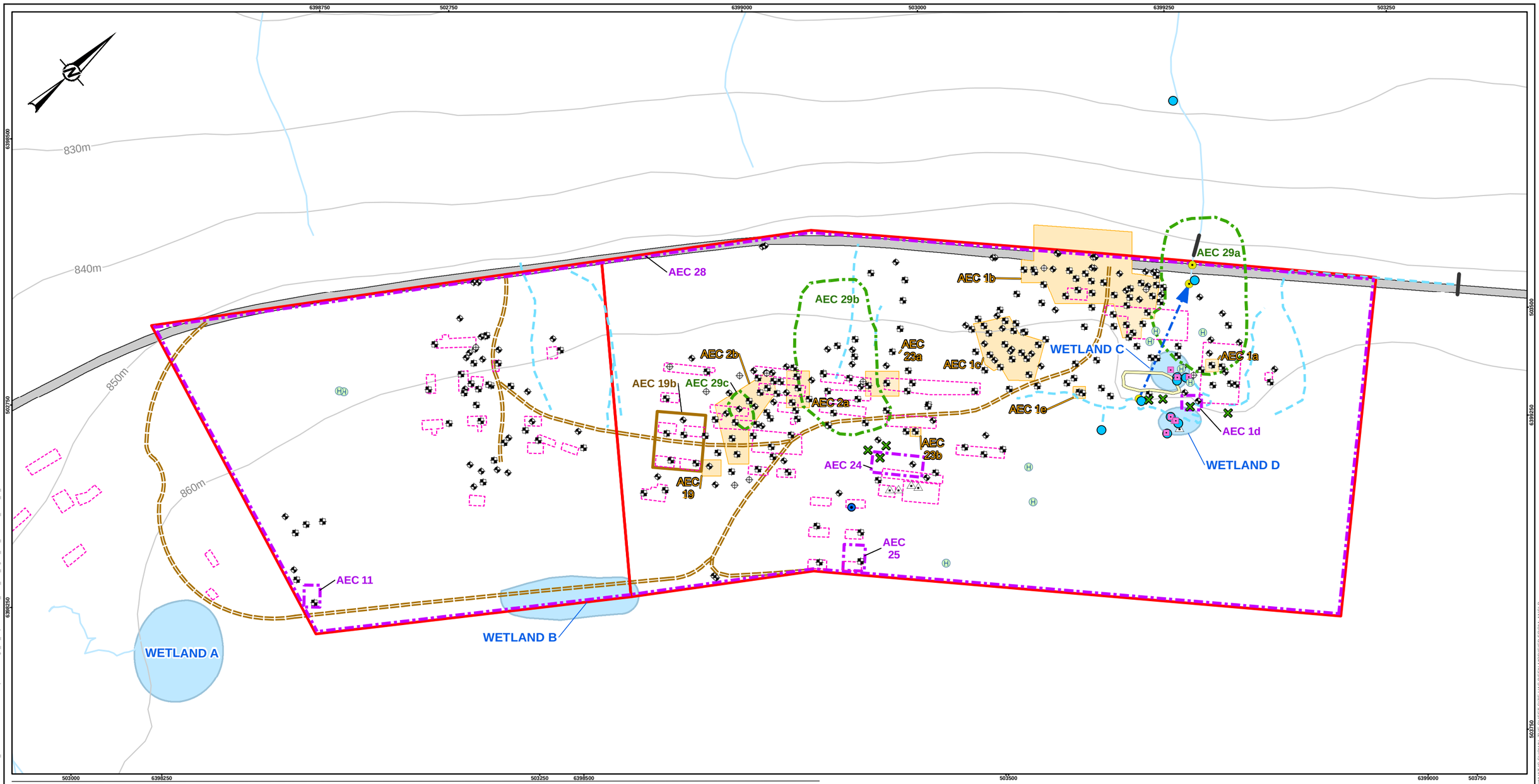

LEGEND

- SURFACE SAMPLE
- DW WELL
- BOREHOLE
- MONITORING WELL
- TEST PIT
- SEDIMENT SAMPLE
- HAND DUG SURFACE SOIL SAMPLE
- HAND AUGER
- SURFACE WATER
- WOODEN CULVERT
- STEEL CULVERT
- CONTOUR (10m)
- SECONDARY ROAD
- INFERRED UNDERGROUND WATERCOURSE
- APPROXIMATE SEASONAL SWALE / DRAINAGE DITCH
- WATERCOURSE
- APPROXIMATE WETLAND
- ALASKA HIGHWAY FORMER ALIGNMENT
- AEC BOUNDARY BASED ON METALS CONTAMINATION
- AEC BOUNDARY BASED ON SODIUM AND/OR CHLORIDE CONTAMINATION
- PRELIMINARY AEC BOUNDARY BASED ON ESTIMATED PETROLEUM HYDROCARBON CONTAMINATION (DELINEATION REQUIRED)
- APPROXIMATE LOCATION OF HISTORICAL BUILDINGS
- SITE LOCATION
- AEC BOUNDARY BASED ON ESTIMATED EXTENT OF PETROLEUM HYDROCARBON CONTAMINATION
- WOOD DEBRIS PILE

DRAFT

0 50 100
1:3,000 METRES

REFERENCE(S)

1. CONTOURS OBTAINED FROM ARCADIS.
2. SURFACE SAMPLES OBTAINED FROM ARCADIS AND GOLDER ASSOCIATES LTD.
3. DW WELL, CULVERT, APPROXIMATE WETLAND AND APPROXIMATE SWALE/DRAINAGE DITCH OBTAINED FROM GOLDER ASSOCIATES LTD.
4. BOREHOLES OBTAINED FROM ARCADIS AND VECTOR GEOMATICS.
5. TEST PITS AND MONITORING WELLS OBTAINED FROM ARCADIS, VECTOR GEOMATICS, AND GOLDER ASSOCIATES LTD.
6. ALASKA HIGHWAY FORMER ALIGNMENT AND SECONDARY ROADS OBTAINED BY ARCADIS, PORTIONS DERIVED BY VECTOR GEOMATICS, FEBRUARY 7TH AND 8TH, 2017.
7. WATERCOURSES OBTAINED BY B.C. MINISTRY OF FORESTS, LAND AND NATURAL RESOURCE OPERATIONS.
8. PROJECTION: UTM ZONE 10N DATUM: WGS84

CLIENT
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-12-15
DESIGNED	EOB
PREPARED	RC
REVIEWED	
APPROVED	

PROJECT
K-19 TRUTCH FORMER TOWNSITE
ALASKA HIGHWAY, B.C.

TITLE
ESTIMATED AREAS OF CONTAMINATION

PROJECT NO.	CONTROL	REV.	FIGURE
1657709	5000	A	17

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PATH: \\golder.gds\ga\burnaby\CAD-GIS\Cle\rl\PWGSC\Alaska_Highway\99_PROJECT\S\1657709\02_PRODUCTION\5000\MXD\ReportK19\Stage_10_Report\1657709_5000_K19_Figure_017_Estimated_Areas_of_Contamination.mxd PRINTED ON: 2017-12-15 AT: 11:14:35 AM

APPENDIX A

Photographic Summary

Photo 1: Backfilled test pit in AEC 1b, looking NW

Photo 2: Test pitting activities at K19-TP17-61 APEC 13, looking S

Photo 3: Soil sampling at K19-TP17-56 APEC 4

Photo 4: Clay pipe identified during the excavation of K19-TP17-57 APEC 4

Photo 5: Completed log bridge for accessing APEC 26, looking NE

Photo 6: Soil sampling at K19-TP17-77 APEC 11

Photo 7: Soil sampling at K19-TP17-83 AEC 23a

Photo 8: Culvert identified during the excavation of K19-TP17-86 APEC 13

Photo 9: Slug testing at K19-MW17-29D AEC 1b

Photo 10: Mulching by M&M Resources in APEC 4

Photo 11: Partially mulched vegetation at APEC 17, looking SE

Photo 12: Partially mulched vegetation at APEC 12, looking N

Photo 13: Drilling K19-MW17-17 AEC 26, Tundra Environmental Drilling

Photo 14: Log piles cleared from AEC 1c, looking W

Photo 15: Excavator removing logs from Site onto neighboring property

Photo 16: Monitoring well installation at K19-MW17-20 APEC 6, Tundra Environmental Drilling

Photo 17: Drilling K19-MW17-29D AEC 1b, Tundra Environmental Drilling

Photo 18: Drilling K19-MW17-33 APEC 14, Tundra Environmental Drilling

APPENDIX B

Environmental Monitoring Summary Report

TECHNICAL MEMORANDUM

DATE 12 December 2017 **REFERENCE No.** 1657709-044-TM-Rev1-5000

TO Dave Osguthorpe
Public Services and Procurement Canada

CC Erin O'Brien. Ahmadreza Mehjoo

FROM Jack Yurko, Christy Jones, Iain Jones **EMAIL** Jack_Yurko@golder.com
Christy_Jones@golder.com

SUMMER ENVIRONMENTAL INVESTIGATION AT SITE K-19, ALASKA HWY, NORTHERN BC – ENVIRONMENTAL MONITORING SUMMARY REPORT

1.0 NOTICE TO READER

This technical memorandum was prepared for Canada in accordance with terms and conditions of the Public Services and Procurement Canada (PSPC) in accordance with the terms and conditions of the Site Characterization Consultants Contract with Task Authorizations (CTA) #EZ897-170760/004/PWY) dated 7 December 2016 and scope of work outlined in Golder's document titled "Request for Amendment #1: Environmental investigation at Site K-19, Alaska Highway, Northern, BC", dated 30 June 2017. Approval for the scope of work was provided under TA 700383386, dated 25 May 2017 and amended 5 July 2017.

The inferences concerning Site conditions contained in this technical memorandum are based on information obtained during the assessment conducted by Golder personnel, and are based solely on the condition of the properties at the time of the Site reconnaissance, supplemented by historical and interview information obtained by Golder, as described in this technical memorandum.

This technical memorandum was prepared, based in part, on information obtained from historic information sources. In evaluating the subject Site, Golder has relied in good faith on information provided. We accept no responsibility for any deficiency or inaccuracy contained in this technical memorandum as a result of our reliance on the aforementioned information.

The findings and conclusions documented in this technical memorandum have been prepared for the specific application to this project, and have been developed in a manner consistent with that level of care normally exercised by environmental professionals currently practicing under similar conditions in the jurisdiction.

With respect to regulatory compliance issues, regulatory statutes are subject to change and interpretation. These statutes and interpretations may change over time, and should be reviewed. If new information is discovered during future work, the conclusions of this technical memorandum should be re-evaluated and the technical memorandum amended, as required, prior to any reliance upon the information presented herein.

2.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by PSPC to conduct a supplemental environmental investigation for K-19, Former Trutch Townsite (the Site) located at KM 320 of the old alignment of the Alaska Highway at latitude 57º43.908 north and longitude 122º56.564 west. The Site is located approximately 247 kilometres (km) north of Fort St. John.

This technical memorandum was prepared in accordance with terms and conditions of the PSPC Characterization Consultants Contract with Task Authorizations (CTA) #EZ897-170760/004/PWY) dated 7 December 2016 and scope of work outlined in Golder's document titled "*Request for Amendment #1: Environmental investigation at Site K-19, Alaska Highway, Northern, BC*", dated 30 June 2017. Approval for the scope of work was provided under TA 700383386, dated 25 May 2017 and amended 5 July 2017.

The field investigation was completed between 12 and 30 July 2017.

3.0 PROJECT INFORMATION

Project Name: K-19 Trutch townsite (the Site) Environmental Investigation

Location: North of Fort St. John near Kilometer 320 of the Alaska Highway, BC

Activities: Works conducted as part of the Summer Environmental Investigation at Site K-19 (the Program) included vegetation clearing and mulching, trail building, drill pad construction, test pitting, drilling, hand augering, and soil and groundwater sampling.

Vegetation removal and mulching activities were required to provide access for the equipment (excavator and drill rig) and expose environmental investigation areas for the Program. Tree and shrub clearing boundaries were flagged for each investigation area by North Forest Resources Management Ltd. (NFRM) prior to vegetation removal and mulching. Mulching activities by M&M Resources Inc. occurred from 14 to 19 July 2017 and consisted of mulching non-merchantable deciduous and coniferous tree and shrub species, and a limited volume of merchantable timber (up to 66 m^3).

Subsurface investigations (test pits) were conducted using a hydraulic excavator by Eh Cho Dene to a maximum depth of the bedrock refusal to complete additional delineation work at existing Areas of Environmental Concern (AECs) and to assess previously identified Areas of Potential Environmental Concern (APECs). Boreholes were drilled by Tundra Environmental Drilling Services Ltd. (Tundra) and some were completed as monitoring wells to allow evaluation of groundwater conditions at AECs and APECs. Hand auger holes were completed to obtain subsurface soil samples in areas that could only be accessed by foot due to access constraints or where shallow (<1 m) soil samples were required. Test pits and boreholes were completed under the supervision of a qualified geo-environmental technician. Additional information about the Program is found in the Supplementary Report on Environmental Investigation - K19 Trutch Former Townsite, Alaska Highway, Northern BC (to which this memorandum is attached).

4.0 SUMMARY OF SITE ACTIVITIES

4.1 Environmental Monitoring

Golder Associates Ltd. (Golder)'s Environmental Monitor (EM) (Jack Yurko) conducted Site inspections from 12 to 17 July 2017, Golder's Alternate EM (Konane Dion-Belair) conducted daily Site inspections from 18 to 27 July 2017, and Golder's Alternate EM (Michael Zima) conducted daily Site inspections from 28 to 30 July 2017.

The inspections included a review of:

- General Site conditions; including observations or sign of wildlife.
- Identified and delineated environmentally sensitive areas.
- Compliance with the Environmental Protection Plan (EPP), dated 7 July 2017 (final).

4.2 Pre-Clearing Nest Survey Search

The federal *Migratory Birds Convention Act* (MBCA; Government of Canada 1994) and the BC *Wildlife Act* (BCWA; Government of BC 1996) protect migratory birds, their eggs and nests. Environment Canada (2016a) provides information on general nesting periods of birds to support the planning of activities to reduce the risk of detrimental effects to migratory birds, their nests and eggs. The general nesting season for migratory birds in the region (B6 nesting zone) is from 30 April to 14 August for forested habitat (EC 2016a). Vegetation clearing and environmental investigations during this period have the potential to result in incidental take of migratory birds, their eggs and nests. The purpose of the surveys were to search for, and mark active bird nests within the area to be cleared and establish appropriate no-disturbance buffers to reduce the potential for contravention of the MBCA and the BCWA.

Using Golder's standard breeding bird survey protocol, Golder's EM and secondary crew (Adam Dowding) performed bird nesting surveys in each of the proposed clearing areas requiring tree felling and vegetation clearing/removal prior to planned tree clearing during the migratory bird nesting period:

- Pre-clearing bird nesting surveys commenced two days ahead of vegetation removal and mulching activities.
- Surveys were conducted for active nest presence within proposed equipment access routes and clearing areas as well as a 30 m buffer around these planned work areas.
- Auditory and behavioural cues (e.g., localized territorial singing, alarm calling, nest-building, feeding young) were used to assess nest activity where visual confirmation was not possible. Crews also conducted occasional stand watches to observe bird behaviour.
- Locations of detected nesting birds were recorded and a GPS point taken. Appropriate setback buffers for active nests, within which no vegetation clearing or environmental investigations were allowed to occur, were visibly marked around identified active nests using flagging tape and subsequently identified to crew members and contractors.
- Where vegetation clearing and mulching was to proceed, it was recommended that these activities should occur in areas where no nesting activities have been observed as soon as possible after completion of the pre-clearing nest survey and within a maximum of seven (7) days to reduce the chance that new nests are constructed in the interim following the surveys. It was further recommended that if clearing had not been completed within seven days after completion of the pre-clearing bird survey, a new survey should be completed.

Nine bird species were observed in and around the areas scheduled for clearing (**Table 1**) during the six survey days. All species are provincially listed as 'Yellow' (i.e., apparently secure and not at risk of extinction) (BC CDC 2016).

Table 1: Birds Species and Locations of Identified Nests Observed in the Survey Areas

Species	Dates Observed	Nest Locations (UTM 10V)
American robin *(Turdus migratorius)* [a]	12, 13, 14, and 16 July 2017	-
chipping sparrow (*Spizella passerine*) [a]	12, 13, 14, 16, and 17 July 2017	APEC 4 (503228 E; 6398930 N); APEC 1b (503190 E; 6399015 N)
common raven (*Corvus corax*) [a]	14 July 2017	-
common yellowthroat (*Geothlypis trichas*) [a]	14 July 2017	-
dark-eyed junco (*Junco hyemalis*)	12, 13, and 17 July 2017	APEC 4 (503077 E; 6398913 N)
hairy woodpecker (*Picoides villosus*)	13 July 2017	-
least flycatcher (*Empidonax minimus*)	15 July 2017	-
mourning warbler (*Geothlypis philadelphia*)	13 July 2017	-
Northern harrier (*Circus cyaneus*) [b]	15 July 2017	-
orange-crowned warbler (*Oreothlypis celata*)	17 July 2017	APEC 4 (503203 E; 6398943 N)
ovenbird (*Seiurus aurocapilla*) [a]	12 and 13 July 2017	-
pine siskin *(Pinus spinus)* [a, b]	12, 15 and 17 July 2017	-
red crossbill *(Loxia curvirostra)* [a]	12 July 2017	-
red-breasted nuthatch (*Sitta Canadensis*) [a]	12, 15, and 17 July 2017	-
red-tailed hawk (*Buteo jamaicensis*) [a]	12 July 2017	-
rose-breasted grosbeak (*Pheucticus ludovicianus*)	15 July 2017	-
Tennessee warbler (*Oreothlypis peregrine*)	12 and 13 July 2017	-
yellow warbler (*Setophaga petechial*)[a]	13, 14, and 15 July 2017	-
yellow-bellied sapsucker (*Sphyrapicus varius*)	14 July 2017	-

Notes: [a] indicates species also observed near, but outside, the area scheduled for clearing; [b] indicates species observed flying over, or through, the area scheduled for clearing.

4.2.1 APEC 1b

APEC 1b measured approximately 250 m^2 and was surveyed on 15 and 16 July 2017. The canopy of the area was composed primarily of willow species with occasional trembling aspen. The understory was comprised of highbush cranberry (*Vibernum edule*) and prickly rose. The site was bordered by the former Alaska Highway alignment to the west, the main access in to the site on the north, APEC 4 to the south, and a previously cleared area to the east. A suspected active nest was identified in long grass in APEC 1b based on a pair of birds having been observed flying in and out of the grass at the same location, carrying materials in their beak to this location, and behaving aggressively when the grass patch was approached. An appropriate nest buffer was established for the area using blue flagging tape with strips of green flagging tape.

4.2.2 APEC 4

APEC 4 has an area of approximately 5,700 m^2 and was surveyed on 12 July 2017 and revisited on 17, July 2017. The tree canopy was observed to be composed of mature balsam poplar (*Populus balsamifera*), trembling aspen (*P. tremuloides*), and white birch (*Betula papyrifera).* The understory was comprised of willow species (*Salix* sp.), green alder (*Alnus crispa*), raspberry (*Rubus idaeus),* and prickly rose (*Rosa acicularis*). The area is bordered by the resource access road to the west, previously cleared areas to the north and east, and similar forest type to the south.

Three active bird nests were observed during the survey and subsequent visit and appropriate nest buffers were established using blue flagging tape with strips of green flagging tape:

- A chipping sparrow nest with four eggs was observed beyond the east corner of APEC 4 on 12 July 2017, but within the recommended 30 m non disturbance buffer. The nest was located in willow approximately 1.2 m off of the ground.
- A dark-eyed junco nest containing at least 3 chicks was identified beyond the west corner of APEC 4 on 12 July 2017, but within the recommended 30 m non disturbance buffer. The nest was located on the ground approximately 2 m from the former Alaska Highway alignment, which provides access to the Site. The adult was observed to flush from the nest when vehicles passed.
- An orange crowned warbler nest was observed 3 m from the previously cleared area of APEC 4 on 17 July 2017, but within the recommended 30 m non disturbance buffer. The nest was located on the ground at the base of a willow tree.
- Activity at the chipping sparrow nest initially identified within the buffer zone of APEC 4 was not observed when the site was re-visited on 17 July 2017 and it was noted that the nest was not occupied, likely having been depredated. Therefore, the EM removed the flagging tape that had indicated the presence of an active nest.

4.2.3 Access to APECs 11 and 12

The access to APECs 11 and 12 was surveyed on 15 July 2017. The canopy of the route was composed of trembling aspen, white birch, lodgepole pine and black spruce. The understory was comprised of willow species, green alder, raspberry, and prickly rose. No active nests and no breeding bird behaviour were observed during the 15 July 2017 survey. An expansion of this access measuring approximately 50 m^2 was surveyed on 16 July 2017. The canopy of the expansion area was composed of willow species and green alder. No active nests and no birds were observed during the 16 July 2017 survey.

4.2.4 APECs 11 and 12

APECs 11 and 12 have an area of approximately 283 m^2 and were surveyed on 14 July 2017. The canopy of both areas was composed of trembling aspen, white birch, lodgepole pine and black spruce (*Picea mariana*). The understory was comprised of willow species, green alder, raspberry, and prickly rose. APECs 11 and 12 were surrounded by a similar type forest except to the west which was a black spruce dominated forest. No active nests and no breeding bird behaviour were observed during the 14 July 2017 survey.

4.2.5 APECs 13, 14, and 15

APECs 13, 14, and 15 were surveyed as one group due to their close proximity on 12 July 2017. The three areas cover approximately 4344 m^2. The canopy was composed of balsam poplar, trembling aspen, white birch, white spruce (*Picea glaucus*), and lodgepole pine (*Pinus contorta*). The understory contained willow species, green alder, raspberry, and prickly rose. No nests were observed during the 12 July 2017 survey; however, there was observed bird activity along the west section of APEC 13.

APEC 13 was re-surveyed on 13 July 2017 due to elevated bird activity observed during the previous day. The area covered was primarily the north-east side of the APEC and measured approximately 1575 m^2. The canopy was composed of balsam poplar, trembling aspen, white birch, white spruce, and lodgepole pine. The understory contained willow species, green alder, raspberry, and prickly rose. No nests were observed during the 13 July 2017 survey, within the planned work areas or the recommended 30 m non disturbance buffer for APEC 13. Elevated breeding bird activity was observed but was beyond planned work areas and associated buffers.

4.2.6 APECs 16 and 17

APECs 16 and 17 have an area of approximately 575 m^2 and were surveyed on 13 July 2017. The canopy of both areas was composed of mature balsam poplar, trembling aspen, white birch, and white spruce. The understory was comprised of willow species, green alder, raspberry, and prickly rose. APEC 16was entirely surrounded by the same forest type. APEC 17 was bordered by the same forest type to the south and east, and existing access routes to the north and west. No active nests and no breeding bird behaviour were observed during the 13 July 2017 survey.

4.2.7 APECs 19 and 20

APECs 19 and 20, located adjacent to each other, required expansions of the existing pads cleared in February 2017. Each expansion measures approximately 50 m^2 and were surveyed on 17 July 2017. The canopy of the pad extensions was composed of balsam poplar and trembling aspen, white spruce, and white birch with an understory consisting of willow and green alder. No nests or breeding bird activity were observed during the 17 July 2017 survey.

4.2.8 Access to APEC 24

The access to APEC 24 has an area of approximately 35 m^2 and was surveyed on 17 July 2017. The canopy of the route was composed of balsam poplar and trembling aspen, with an understory consisting of willow species and green alder. No nests or breeding bird activity were observed during the 17 July 2017 survey.

4.3 Environmental Management

An Environmental Orientation meeting was conducted during the daily Site health and safety meeting on 12 July 2017 by the EM with the Golder geo-environmental crew.

An Environmental Orientation meeting was conducted by the EM or alternate EM prior to new crew members commencing work and where new activities were planned. These consisted of the following Environmental Orientation meetings:

- 12 July 2017 with Golder's environmental and water quality crews.
- 14 July 2017 with Golder's crew members, the mulching contractor M&M Services (Elton Hagen), and test-pitting contractor Eh Cho Dene (Greg Loman).
- 15 July 2017 with utility locator contractor Underworld Utility Locating (Braeden Batter, Riley Palmer).
- 16 July with a new Golder employee to site (Darrell Klammer).
- 18 July 2017 with drilling contractor Tundra (Ryan Anderson, Larry Lavalee).

During each of the above orientation meetings the team discussed the planned activities and related environmental requirements and sensitivities as per the Environmental Protection Plan. Outside of these orientations, daily tailboard meetings were conducted during health and safety meetings by EM's each morning prior to work commencing. Environmental topics of discussion included fire hazard ratings, key components and mitigation associated with activities as per the EPP (i.e., sediment and erosion control, spill prevention and emergency response, noise management), clarification of environmentally sensitive areas, and explanation of the roles of the environmental staff to Site contractors including for the following contractors during the period they were conducting active work onsite:

- M&M (mulching): 14 to 19 July 2017.
- Eh Cho Dene (excavating): 14 to 22 July 2017.
- Tundra (drilling): 18 to 27 July 2017.
- Underworld (line locating): 16 to 17 July 2017.
- Vector (surveying): 27 to 28 July 2017.

Prior to the commencement of work the EM flagged off environmentally sensitive areas with high visibility flagging as specified in the EPP prior to planned ground disturbance activities. Flagging was hung on vegetation and/or wooden stakes placed along pre-determined setback distances from environmental sensitive areas including:

- 5 m setbacks from ditches/swales.
- 15 m setbacks from wetlands and streams.

The high visibility flagging demarcating sensitive areas was maintained throughout the Program. Additional flagging was placed, when necessary, to deter equipment from entering other potentially sensitive areas outside of the planned work area and/or to provide visible delineation for the extent of required vegetation clearing activities.

Prior to and during active work the EMs inspected for compliance with the EPP and confirmed the following mitigation measures and Best Management Practices (BMPs) were adhered during the Program on a daily basis:

- Vehicles had stayed on defined pathways.
- Confirmed operators had inspected equipment for cleanliness and potential leaks.
- Visually assessed the mulcher, excavator, and bulldozer for cleanliness.
- Spill kits were available on equipment as required.
- Waste was collected at site and disposed of off-site at days end.
- Potential environmentally sensitive areas were delineated and equipment did not encroach on established setbacks.
- Fire extinguishers were available on equipment as required.
- Fire rating was within acceptable levels and was checked before work commenced.

A summary of investigation activities and associated highlights of daily EM works completed during the Program, other than those reported above, are provided in Table 2.

Wildlife observations on Site during the Program in addition to bird activity discussed in Section 2. 2 were limited to the following:

- One deer was observed foraging on site by the water quality crew on 12 July 2017.
- Bear scat was observed throughout the site.

Related to the prevalence of bear scat on the site additional measures implemented for bears and relayed to all crew members and contractors included:

- Keep food in trucks with windows rolled up.
- Work in teams of two or more.
- Carry bear spray and air horn, and make noise before entering a new area.
- If it is necessary to be silent to perform the task, i.e., bird nest surveys, make noise before beginning and listen for all noises and movement in addition to bird calls.
- Pay attention to scat, tracks, digging, and other signs of wildlife. Take note of the relative freshness of the signs and vacate the area if they are deemed to be fresh.
- Keep other crews and contractors informed of wildlife sightings.

Works were conducted in compliance with the EPP. No vegetation clearing, test pitting, or drilling activities were conducted within identified environmentally sensitive areas. Excavated soils from the test pitting activities were segregated in the order they were removed and placed back into the test pit in the reverse order of excavation in keeping with best practices relating to site restoration. Where available, clean mulch (wood chips) were collected and placed over test pit locations to cover exposed soils, reduce potential for erosion, and expedite restoration. There were no observations of Site runoff or erosion to Site watercourses during the Program; however, roads became rutted and muddy during rainfall events on 16 and 17 July 2017 that required placement of clean native mulch to mitigate potential for erosion and offsite migration. For the test pitting and drilling activities, fuel and water was trucked in from Fort Nelson on an as-required basis and supplied to the Site by Radar Road Transport Ltd. (Radar). Table 2 provides a summary of vegetation removal, test pitting, drilling activities and service drop-offs during the Program.

Environmental monitoring summaries were provided daily by the EM/Alternate EM for internal review by Golder's Environmental Lead (Christy Jones) and Project Manager (Erin O'Brien). Daily summaries included descriptions of the environmental investigation activities, descriptions of potential environmental issues encountered and corresponding mitigation measures implemented, lists of communications with on Site personnel, and photos documenting environmental investigation activities.

Table 2: Summary of Construction Activities and Environmental Monitoring

Date	Equipment Active on Site	Construction Activities	Environmental Monitoring Highlights
12 July	None	None	■ Pre-clearing nest survey search at APEC 4, 13, 14 and 15. ■ Reconnaissance of identified environmental sensitive areas and established high visibility flagging at setback distances associated with watercourses.
13 July	None	None	■ Pre-clearing nest survey search at APECs 13, 16, and 17. ■ Reconnaissance of identified environmental sensitive areas and established high visibility flagging at setback distances associated with watercourses. ■ Worked with the geo-hydrologist to identify proposed test pit locations and access routes. Environmental areas of concern were pointed out and test pits and monitoring well locations were adjusted accordingly. ■ Installed flagging to delineate access routes and test pit pads at APEC 13.
14 July	1 mulcher 1 excavator	**Vegetation removal:** Tree and shrub removal and mulching in proposed investigation areas. **Test pitting:** Program began using one excavator. Completed 5 test pits: ■ K19-TP17-51 ■ K19-TP17-52 ■ K19-TP17-53 ■ K19-TP17-54 ■ K19-TP17-55	■ Conducted pre-clearing nest survey search at APEC 14. ■ Mulching operator was given a tour of the site and shown the specific work areas and areas of concern in proximity were pointed out. ■ Mulcher operator was directed at each site with respect to compliance with flagging boundaries. ■ Reconnaissance of identified environmental sensitive areas and established high visibility flagging at setback distances associated with watercourses. ■ Chose alternate route to APEC 4 to avoid impacting drainage. ■ Confirmed with PM the size required for test pitting, and the extent to which being conservative in removing and mulching trees as was practical.

Date	Equipment Active on Site	Construction Activities	Environmental Monitoring Highlights
15 July	1 mulcher 1 excavator Utility locator	**Vegetation removal:** Tree and shrub removal and mulching in proposed investigation areas. **Test pitting:** Completed 4 test pits: ■ K19-TP17-56 ■ K19-TP17-57 ■ K19-TP17-58 ■ K19-TP17-59	■ Pre-clearing nest survey search at access to APECs 11 and 12, and APEC 1b. ■ Reconnaissance of identified environmental sensitive areas and potential hazards. ■ High visibility flagging was established around identified sensitive areas and identified potential hazards. ■ Inspected vegetation removing and mulching activities near environmentally sensitive areas. ■ Directed mulcher operator at each site with respect to compliance with flagging boundaries. ■ Flagged routes into APECs 1b, 11, 12, 16, and 17. ■ Identified and flagged off an ephemeral wetland adjacent to APEC 1b. ■ Assessed APEC 27 to determine viability of crossing options at the swale for site access.
16 July	1 mulcher 1 excavator Utility locator	**Vegetation removal:** Tree and shrub removal and mulching in proposed investigation areas. **Test pitting:** Completed 4 test pits: ■ K19-TP17-60 ■ K19-TP17-61 ■ K19-TP17-62 ■ K19-TP17-63	■ Pre-clearing nest survey search at access to APECs 11 and 12, and APEC 1b. ■ Directed mulcher operator at each site with respect to compliance with flagging boundaries. ■ Assessed AEC 1e and discovered an unmarked swale at the east border. ■ Surveyed AEC 23a for bird nests, and flagged the area for the mulcher. ■ Directed contractors to add mulch to access for APEC 4 and the south access due to muddy conditions s mitigation relating to erosion control.
17 July	1 mulcher 1 excavator	**Vegetation removal:** Tree and shrub removal and mulching in proposed investigation areas. **Test pitting:** Completed 5 test pits: ■ K19-TP17-64 ■ K19-TP17-65 ■ K19-TP17-66 ■ K19-TP17-67	■ Pre-clearing nest survey search at access to APEC 24 and APECs 19 and 20. ■ Directed mulcher operator at each site with respect to compliance with flagging boundaries. ■ Performed bird nest surveys at to expand existing pads at APECs 24, 19, and 20. ■ Checked on all previously identified bird nests. ■ Assessed pathways and entrances to APECs for erosion and drainage issues. ■ Reassessed the swale at the access to APEC 27. ■ Transfer of EM responsibilities to Alternate EM.

Date	Equipment Active on Site	Construction Activities	Environmental Monitoring Highlights
18 July	1 mulcher	**Sediment sampling:** Completed 8 benthic sample grabs: ■ Wetland C (3 samples) ■ Wetland D (5 samples)	■ No additional observations or measures beyond conducting tailboards and general inspection for best practices discussed above in Section 2.3
19 July	1 mulcher 1 excavator 1 drill rig	**Test pitting:** Completed 2 test pits: ■ K19-TP17-72 (TP 30) ■ K19-TP17-73 (GA_TP-2) **Monitoring wells:** Drilled / installed 2 groundwater monitoring wells: ■ K19-MW17-18 (MW-12) ■ K19-MW17-19 (MW-20)	■ Drilling activities were shut down for approximately 1.25 hours due to thunderstorms in the area. ■ Some minor seepage was observed in the some of the test pits. When backfilling, the test pits were monitored for water seeping above the ground surface and none was observed. ■ Available wood chips spread over disturbed soil and completed test pits. ■ Test pit material was segregated and the material was placed back into the hole in the reverse order it was removed. ■ Logs were placed in the swale next to APEC 27 to facilitate access to the area. A silt fence was installed prior to placing the logs in the swale and the turbidity in the water feature was monitored to confirm sediment-laden water was not bypassing the silt fence.
20 July	1 excavator 1 drill rig	**Test pitting:** Completed 6 test pits: ■ K19-TP17-74 (TP 02) ■ K19-TP17-75 (TP 01) ■ K19-TP17-76 (TP 03) ■ K19-TP17-77 (TP 05) ■ K19-TP17-78 (TP 04) ■ K19-TP17-79 (TP 23) **Monitoring wells:** Drilled / installed 2 groundwater monitoring wells: ■ K19-MW17-20 (MW-11) ■ K19-MW17-20	■ Some minor seepage was observed in the some of the test pits. When backfilling, the test pits were monitored for water seeping above the ground surface and none was observed. ■ Available wood chips spread over disturbed soil and completed test pits. ■ Test pit material was segregated and the material was placed back into the hole in the reverse order it was removed.

Date	Equipment Active on Site	Construction Activities	Environmental Monitoring Highlights
21 July	1 excavator 1 drill rig	**Test pitting:** Completed 5 test pits: ■ K19-TP17-80 (TP 08) ■ K19-TP17-81 (GA_TP-1) ■ K19-TP17-82 (TP 11) ■ K19-TP17-83 (TP B) ■ K19-TP17-84 (TP C) **Monitoring wells:** Drilled / installed 3 groundwater monitoring wells: ■ K19-MW17-21 (MW-9) ■ K19-MW17-22 (MW-10) ■ K19-MW-17-23 (MW-6)	■ Some minor seepage was observed in some of the test pits. When backfilling, the test pits were monitored for water seeping above the ground surface and none was observed. ■ Available wood chips spread over disturbed soil over completed test pits. ■ Test pit material was segregated and the material was placed back into the hole in the reverse order it was removed.
22 July	1 excavator 1 drill rig	**Test pitting:** Completed 3 test pits: ■ K19-TP17-85 (TP D) ■ K19-TP17-86 (TP E) ■ K19-TP17-87 (TP F) **Monitoring wells:** Drilled / installed 3 groundwater monitoring wells: ■ K19-MW17-23 (MW-6) ■ K19-MW17-24 (MW-5) ■ K19-MW17-25 (MW-4) Drilled 1 groundwater monitoring well that was not been completed: ■ K19-MW17-26 (MW-7)	■ Some minor seepage was observed in the some of the test pits. When backfilling, the test pits were monitored for water seeping above the ground surface and none was observed. ■ The logs were removed from the swale into APEC 27. Wood mulch was placed in the area where the logs were removed to mitigate potential for erosion. The silt fence was removed approximately 1 hour after the logs were removed and the swale was visually inspected to confirm the absence of turbidity and exposed soils. ■ Available wood chips spread over disturbed soil over completed test pits. ■ Test pit material was segregated and the material was placed back into the hole in the reverse order it was removed.

Date	Equipment Active on Site	Construction Activities	Environmental Monitoring Highlights
23 July	1 drill rig	**Monitoring wells:** Drilled / installed 2 groundwater monitoring wells: ■ K19-MW17-27 (MW-8) ■ K19-MW17-28 (MW-14) Drilled 2 groundwater monitoring well that were not been completed: ■ K19-MW17-26 (MW-7) ■ K19-MW17-29 (MW-16) **Sediment sampling:** Completed 1 hand auger location: ■ K19-HA17-06 (HA-11)	■ No additional observations or measures beyond conducting tailboards and general inspection for best practices discussed above in Section 2.3
24 July	1 drill rig	**Monitoring wells:** Drilled / installed 1 groundwater monitoring wells: ■ K19-MW17-29S/D (MW-16).	■ Excess drill water was diverted away from watercourses.
25 July	1 drill rig	**Monitoring wells:** Drilled / installed 2 groundwater monitoring wells: ■ K19-MW17-26 (MW-7) ■ K19-MW17-31 (MW-SVP-1)	■ No additional observations or measures beyond conducting tailboards and general inspection for best practices discussed above in Section 2.3
26 July	1 drill rig	**Monitoring wells:** Drilled / installed 3 groundwater monitoring wells: ■ K19-MW17-31 (MW-SVP-2) ■ K19-MW17-32 (MW-19) ■ K19-MW17-33 (MW-2)	■ No additional observations or measures beyond conducting tailboards and general inspection for best practices discussed above in Section 2.3

Date	Equipment Active on Site	Construction Activities	Environmental Monitoring Highlights
27 July	1 drill rig	**Monitoring wells:** Drilled / installed 2 groundwater monitoring wells: ■ K19-MW17-34 (MW-3) ■ K19-MW17-35 S/D (MW-15)	■ The drillers left some supplies (i.e. bentonite chips, filter sand) for well construction on site for future work at nearby K-12 site. The material was stored on a pallet and either contained within totes or plastic bags covered to mitigate exposure to rain and wind and was subsequently removed during work in August. ■ Drill cuttings from K19-MW17-35 had indications of potential contamination. All potentially contaminated soil was placed in appropriate soil containment bags to be handled during future site remediation activities.
28 July		Groundwater and surface water sampling only	■ Purge water with hydrocarbon-like odours and sheen collected during development at K19-MW17-35D and K19-MW17-29S was placed in four 20L plastic buckets, labelled, and stored next to designated soil bags on-Site to be handled during future site remediation activities.
29 July	1 drill rig	**Sediment sampling:** Completed 1 hand auger location: ■ K19-HA17-07 (HA-08)	■ Purge water with hydrocarbon-like odours and sheen collected during sampling/slug-testing at K19-MW17-35D and K19-MW17-29S was placed in 20L plastic buckets, labelled, and stored next to designated soil bags on-Site to be handled during future site remediation activities.
30 July	1 drill rig	**Sediment sampling:** Completed 1 hand auger location: ■ K19-HA17-08 9HA-110	■ Purge water with hydrocarbon-like odours and sheen collected during sampling at K19-MW17-29S and slug testing at K19-MW17-35D was placed in 20L plastic buckets, labelled, and stored next to designated soil bags on-Site to be handled during future site remediation activities.

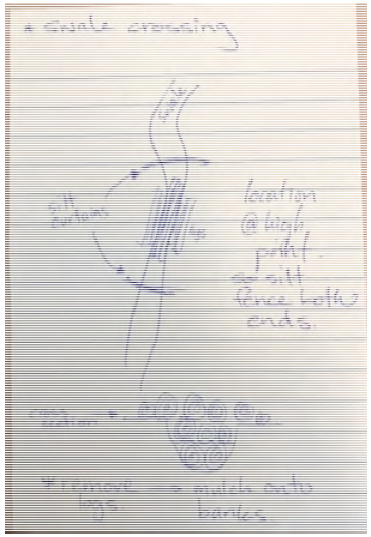
5.0 RECOMMENDED CORRECTIVE ACTION ITEMS

A summary of potential environmental issues observed during the Program, recommended corrective actions discussed with the contractors on Site, and issue resolution is provided in the Table 3.

Table 3: Summary of Issues and Recommended Corrective Action Items.

Date	Issue	Corrective Action or Discussion	Completed/ Resolved
12 July	A dark-eyed junco adult nesting approximately 2 m from Site access was observed to flush from the nest when a vehicle passed.	On 13 July 2017, a folding table was placed between the nest and road to screen the nest to reduce the disturbance by vehicular traffic on the bird and chicks. Crews and contractors were also asked to reduce speed when passing the nest and to not stop or linger in its vicinity. The EM monitored the bird's response as traffic was slowly allowed to proceed.	Observed to be resolved by 13 July 2017. Upon further inspections of the measures and monitoring of the nest, the EM observed that the bird was not flushing nor exhibiting stressed behaviour when vehicles drove with the screening method in place. The nest remained active with the adult bird continuing to attend the nest which remained active following project activities. Given the proximity of the nest to the access road for the site, the screening method proved to be an effective mitigation measure.
13, 15 and 17 July	13 July 2017- The mulcher struck a 3.5 m long steel pipe that was laying on the ground. The pipe got wrapped around the drum of the mulcher and got stuck, stopping the drum from turning. 15 July 2017 - The mulcher hit a solid steel axel rod at the end of the day that broke off a tooth holder on the drum. 17 July 2017 - The mulcher got a tire rim caught in the drum and could not free it.	Crews and contractors were asked to flag items when they are observed that may affect the mulcher. 13 July 2017- A chain was attached to the drum and pulled slightly by the excavator, turning the drum and dislodging the pipe. 17 July 2017 - The excavator was employed to turn the drum and release the rim successfully.	No environmental issues arose from these incidents.
15 July	The mulcher had a loose clamp on a hose causing antifreeze to spray on the inside of his machine.	Upon inspecting the area no liquid was observed on the ground and appeared to have been contained within the cage. The operator tightened the hose and cleaned up the fluid on and within his machine. Approximately 20 minutes later the clamp came loose again with similar results. Again, no liquid was observed to have contacted the ground as it was contained within the cage of the machine. The	Observed to be resolved by 15 July 2017. No environmental issues arose from this incident.

Date	Issue	Corrective Action or Discussion	Completed/ Resolved
		operator retrieved another clamp and installed it on the hose more securely and no further leaks occurred.	
15 to 22 July	The access to APEC 27 was created in the winter through a swale that had not been identified at that time due to winter conditions. The swale was now observed to hold water during the work activities and may result in erosion if not mitigated further should it be traversed with equipment.	The QEP in consultation with the EM (and contractors) discussed that alternative accesses were not feasible or desirable due to existing site vegetation and drainages. Possible crossing structures discussed with contractors included rig mats, swamp pads, and logs. There were no observable flows in the approximately 25-45 cm deep and 4 m wide channel and no fish or amphibian activity was noted by the EM. The QEP in consultation with the EM and PM recommended that a crossing be established over the swale to allow access to APEC 27 using logs from the Site as this would be the least damaging to the swale and it banks. Logs were recommended to be placed in the channel parallel with the banks as well as on each bank (see sketch below). Silt fence was also recommended to retain soil and sediment on either side of the crossing structure as the Site was at a high point where flows or effects during each crossing with the excavator could be moving in either direction. Further the QEP recommended that activities be limited to once over and back to complete work activities beyond the swale in limiting the number of crossings required.	Communicated to crew that no crossings be attempted until a solution has been identified on 15 July 2017. PM communicated the recommendations to the crew and contractors on 18 July 2017. Crews installed the silt fencing and then placed logs in channel on 19 July 2017 prior to traversing the swale. The measures were observed to be implemented as recommended during works with the work completed and the feature restored as of 22 July 2017. This included removal of the logs from the swale and the placement of wood mulch in the area where the logs were removed to mitigate potential for future erosion. The silt fence was removed approximately 1 hour after the logs were removed and the swale was visually inspected to confirm the absence of turbidity and exposed soils within the swale.

Date	Issue	Corrective Action or Discussion	Completed/ Resolved
			
16 and 17 July	Localized erosion resulting from: ■ Equipment leaving APECs due to the nature of how the skid steer turns, which can tear the earth under the tracks ■ Rain causing rills to form on the south access route. Pooling on the access was noticed near the end of the day.	Contractors requested to continue adding clean mulch in order to increase traction on the vegetated access routes as vehicular traffic had potential to result in vegetation loss. Contractors requested to continue adding more mulch to areas of the access where water was collecting to slow the flow, cover exposed soils, and prevent rills from expanding. Consider using the excavator to dig in water bars if the rain persists and the mulch becomes less effective. Contractors requested to have the excavator add mulch to the access and smooth out its tracks when leaving a site. There was no silt fencing available on site, requested having Eh Cho Dene ready to source some quickly if rain continues.	Observed to be ongoing and effective by 17 July 2017. No environmental issues arose from these issues that were considered resolved upon completion of site restoration.

6.0 SITE RESTORATION

During the Program, after each test pit or drilling location was completed the EM and/or Alternate EM inspected the Site and associated accesses to confirm compliance with the EPP and that the individual investigation area was clean and necessary restoration measures were implemented. Due to coverage from wood chips, no seeding of exposed soils was recommended by the EM and/or Alternate EM. Clean, local native wood chips generated from mulching activities were placed over the backfilled test pits and drill areas when possible. It is estimated that approximately 70% of the test pit and drill locations were covered with available wood chips during the Program. No immediate site restoration is recommended at this time due to forthcoming remediation plans by PSPC at the Site; however, the Program investigation locations should be assessed by PSPC or its Agent during remediation activities for evidence of erosion and/or proliferation of noxious weeds and restored, as necessary during and following future remediation activities.

7.0 POST-CONSTRUCTION

Demobilization by remaining contractors and Golder field crew occurred on 31 July 2017. Waste generated during the Program was removed from Site; however, sensitive area flagging tape was not removed as it was determined to be useful for delineating environmentally sensitive areas during forthcoming remediation activities at the Site. Three soil bags and five 20-L buckets of contaminated purge water of cuttings generated from the summer program and were contained and left on Site. It is understood that the completion of removal of flagging tape, soil bags and contaminated purge water will occur during planned future remediation works at K-19.

8.0 CLOSURE

We trust that the information contained within this technical memo is sufficient for your needs. Should you have questions, please do not hesitate to contact the undersigned at 604-296-4200.

GOLDER ASSOCIATES LTD.

Jack Yurko
Environmental Scientist

Christy Jones, PAg, RPBio
Senior Biologist and Agrologist

Iain Jones, MSc, Dipl Tech, RPBio
Associate, Senior Ecologist

LJY/CJ/IJ/syd

Attachments: Site Photos

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Photo 1: Buffer and subsequent folding table set up to mitigate effects from traffic disturbance on a dark-eyed junco nest along the former Alaska Highway alignment and near APEC 4.

Photo 2: Debris (pipes) observed sticking out of ground near the proposed location for K19-TP17-58 and flagged for mulcher.

Photo 3: The pipe and hose that came loose in the mulcher causing antifreeze to leak (left photo) and antifreeze on the interior wall of the mulcher cage, which was able to contain the release(right photo).

Photo 4: APEC 17 mulched area as viewed from within the swale buffer zone (left photo) and the mulcher clearing a path to APEC 4 (right photo).


Photo 5: The swale at APEC 27, which collected water during rainfall before the crossing and during construction of the temporary crossing on 19 July.

Photo 6: Excavator replacing soil into a completed test pit in the reverse order it was taken so that topsoil remains at the surface.

Photo 7: Above shows the rutting that occurs when the excavator turns when leaving a site. Below is after the excavator has smoothed the surface and added mulch.

APPENDIX C

Test Pit and Hand-Dug Logs

PROJECT No.: 1657709 / 5000

RECORD OF HAND AUGER: K19-HA17-01

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19

DRILLING DATE: July 17, 2017

DATUM: Geodetic

N: ~6399102 E: ~503342
Note: Northing and Easting Coordinates have been determined by GPS in the field and are approximate only.

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (⊕) 10 20 30 40 / MiniRae 3000 ppm (□) 50 100 150 200	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80 / WATER CONTENT % Wp W Wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		Ground Surface														
0	Hand Auger	GRAVEL and CLAY, trace sand, coarse gravel; dark greyish brown, no odour, no staining; cohesive fines, w~PL, soft.		0.00						1	03811-01					
		(CL) SILTY CLAY, trace sand, trace fine gravel; greyish brown, no odour, no staining; cohesive, w>PL, firm.		0.30						2	03811-04		⊕			
		End of Hand Auger. Reached Target Depth.		0.65												
1																
2																

DEPTH SCALE
1 : 10

Golder Associates

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: DK
CHECKED: EOB

National IM Server:GINT_GAL_NATIONALIM Unique Project ID: Output Form:BC_BOREHOLE (GEOENVIRO) RY:James 14/11/17

PROJECT No.: 1657709 / 5000

RECORD OF HAND AUGER: K19-HA17-02

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19

DRILLING DATE: July 17, 2017

DATUM: Geodetic

N: ~6399068 E: ~503365
Note: Northing and Easting Coordinates have been determined by GPS in the field and are approximate only.

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (⊕) 10 20 30 40 / MiniRae 3000 ppm (□) 50 100 150 200	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80 / WATER CONTENT % Wp W Wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
0		Ground Surface														
	Hand Auger	**(ML)** CLAYEY SILT, trace sand, organics/roots; brown, no odour, no staining; cohesive, w~PL, very soft.		0.00												
										1	03811-02	⊕				
		- coarse gravel below 0.65m														
		End of Hand Auger. Reached Target Depth.		0.65												
1																
2																

DEPTH SCALE
1 : 10

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: DK
CHECKED: EOB

Golder Associates

PROJECT No.: 1657709 / 5000

RECORD OF HAND AUGER: K19-HA17-03

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19

DRILLING DATE: July 17, 2017

DATUM: Geodetic

N: ~6399070 E: ~503352
Note: Northing and Easting Coordinates have been determined by GPS in the field and are approximate only.

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm ⊕ (10 20 30 40) / MiniRae 3000 ppm □ (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % Wp W Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		Ground Surface														
0	Hand Auger	**(GC)** GRAVEL and CLAY, fine to coarse gravel; greyish brown, no odour, no staining; non-cohesive, moist, dense. - increasing gravel content with depth		0.00						1	03811-03	⊕				
		End of Hand Auger. (Refusal)		0.40												
1																
2																

DEPTH SCALE
1 : 10

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: DK
CHECKED: EOB

Golder Associates

PROJECT No.: 1657709 / 5000

RECORD OF HAND AUGER: K19-HA17-04

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19

DRILLING DATE: July 17, 2017

DATUM: Geodetic

N: ~6399075 E: ~503316
Note: Northing and Easting Coordinates have been determined by GPS in the field and are approximate only.

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm ⊕ (10 20 30 40) / MiniRae 3000 ppm □ (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % Wp W Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		Ground Surface														
0	Hand Auger	**(CL)** SILTY CLAY, trace fine sand; brown, no odour, no staining; cohesive, w>PL, wet.		0.00						1	03811-05/03811-06	⊕				
		End of Hand Auger. Reached Target Depth.		0.65												
1																
2																

DEPTH SCALE
1 : 10

Golder Associates

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: DK
CHECKED: EOB

PROJECT No.: 1657709 / 5000

RECORD OF HAND AUGER: K19-HA17-05

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19

DRILLING DATE: July 17, 2017

DATUM: Geodetic

N: ~6399066 E: ~508319
Note: Northing and Easting Coordinates have been determined by GPS in the field and are approximate only.

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm ⊕ (10 20 30 40) / MiniRae 3000 ppm □ (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % Wp W Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		Ground Surface														
0	Hand Auger	**(SP-GP)** SAND and GRAVEL, some fines; brown, no odour, no staining; non-cohesive, wet, dense.		0.00						1	03811-07	⊕				
		End of Hand Auger. (Refusal)		0.30												
1																
2																

DEPTH SCALE
1 : 10

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: DK
CHECKED: EOB

Golder Associates

National IM Server:GINT_GAL_NATIONALIM Unique Project ID: Output Form:BC_BOREHOLE (GEOENVIRO) RY:James 14/11/17

PROJECT No.: 1657709 / 5000

RECORD OF HAND AUGER: K19-HA17-06

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19

DRILLING DATE: July 23, 2017

DATUM: Geodetic

N: ~6398927 E: ~503329
Note: Northing and Easting Coordinates have been determined by GPS in the field and are approximate only.

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (⊕) 10 20 30 40	MiniRae 3000 ppm (□) 50 100 150 200	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80	WATER CONTENT % Wp W Wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
0		Ground Surface																
	Hand Auger	**(MH)** CLAYEY SILT; dark brown, no staining, no odour; cohesive, w~PL, firm.		0.00														
		(MH) CLAYEY SILT; greyish brown, no staining, no odour; cohesive, w~PL, stiff.		0.50						1	03845-01	⊕						
1		Completely weathered (W5), greyish brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	1.00						2	03845-02	⊕						
										3	03845-03	⊕						
		End of Hand Auger. Reached Target Depth.		1.50														
2																		

DEPTH SCALE
1 : 10

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: DK
CHECKED: EOB

Golder Associates

PROJECT No.: 1657709 / 5000

RECORD OF HAND AUGER: K19-HA17-07

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19

DRILLING DATE: July 29, 2017

DATUM: Geodetic

N: ~6398827 E: ~503342
Note: Northing and Easting Coordinates have been determined by GPS in the field and are approximate only.

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (⊕) 10 20 30 40	MiniRae 3000 ppm (□) 50 100 150 200	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80	WATER CONTENT % Wp W Wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
0		Ground Surface																
	Hand Auger	**(CL)** SILTY CLAY; brown, no odour, no staining; cohesive, w>PL, firm.		0.00						1	03606-01	⊕						
		End of Hand Auger. Reached Target Depth.		0.50														
1																		
2																		

DEPTH SCALE
1 : 10

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: DK
CHECKED: EOB

Golder Associates

National IM Server:GINT_GAL_NATIONALIM Unique Project ID: Output Form:BC_BOREHOLE (GEOENVIRO) RY:James 14/11/17

PROJECT No.: 1657709 / 5000

RECORD OF HAND AUGER: K19-HA17-08

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19

DRILLING DATE: July 30, 2017

DATUM: Geodetic

N: ~6398911 E: ~503352
Note: Northing and Easting Coordinates have been determined by GPS in the field and are approximate only.

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	GEOTECH SAMPLES: TYPE	GEOTECH SAMPLES: BLOWS/0.3m	GEOTECH SAMPLES: CORE No.	GEOTECH SAMPLES: CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	CHEMISTRY SAMPLES: SCN	CHEMISTRY SAMPLES: ANALYSED	MiniRae 3000 ppm ⊕ (10 20 30 40) / MiniRae 3000 ppm □ (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % Wp W Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
0		Ground Surface														
	Hand Auger	**(CL)** SILTY CLAY, rootlets; dark brown, no staining, no odours; cohesive, w~PL, firm.		0.00						1	03606-02	⊕				
		(CL) SILTY CLAY; grey-brown, no staining, no odour; cohesive, w~PL, firm.		0.50						2	03606-03/03606-04	⊕				
1		End of Hand Auger. Reached Target Depth.		1.10												
2																

DEPTH SCALE
1 : 10

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: DK
CHECKED: EOB

Golder Associates

PROJECT No.: 1657709 / 5000

RECORD OF HAND AUGER: K19-HA17-09

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19

DRILLING DATE: October 11, 2017

DATUM: Geodetic

N: ~6398559 E: ~502916
Note: Northing and Easting Coordinates have been determined by GPS in the field and are approximate only.

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
0		Ground Surface														
	Hand Auger	TOPSOIL.		0.00												
		(OL) organic SILT, rootlets; brown, no odour, no staining.								1	04263-01	⊕				
		(ML) SILT; no odour, no staining.		0.46												
1										2	04263-02	⊕				
		End of Hand Auger. Reached Target Depth.		1.52												
2																

DEPTH SCALE
1 : 10

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KT
CHECKED: EOB

Golder Associates

National IM Server:GINT_GAL_NATIONALIM Unique Project ID: Output Form:BC_BOREHOLE (GEOENVIRO) RY:James 14/11/17

PROJECT No.: 1657709 / 5000

RECORD OF HAND AUGER: K19-HA17-10

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19

DRILLING DATE: October 11, 2017

DATUM: Geodetic

N: ~6398562 E: ~502919
Note: Northing and Easting Coordinates have been determined by GPS in the field and are approximate only.

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (⊕) 10 20 30 40	MiniRae 3000 ppm (□) 50 100 150 200	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80	WATER CONTENT % Wp W Wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
0		Ground Surface																
	Hand Auger	TOPSOIL.		0.00														
		(ML) SILT; no odour, no staining.		0.05						1	04263-03	⊕						
1										2	04263-04	⊕						
		End of Hand Auger. Reached Target Depth.		1.52														
2																		

DEPTH SCALE
1 : 10

Golder Associates

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KT
CHECKED: EOB

National IM Server:GINT_GAL_NATIONALIM Unique Project ID: Output Form:BC_BOREHOLE (GEOENVIRO) RY:James 14/11/17

PROJECT No.: 1657709 / 5000

RECORD OF HAND DUG: K19-HD17-01

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19

DRILLING DATE: July 16, 2017

DATUM: Geodetic

N: ~6399074 E: ~503403
Note: Northing and Easting Coordinates have been determined by GPS in the field and are approximate only.

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (⊕) 10 20 30 40	MiniRae 3000 ppm (□) 50 100 150 200	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80	WATER CONTENT % Wp W Wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		Ground Surface																
0	Hand Dug	**(ML)** SILT, trace fine sand, some gravel; brown, no odour, no staining; cohesive, w~PL.		0.00														
		End of Hand Dug. (Refusal)		0.40						1	03776-01		⊕					
1																		
2																		

DEPTH SCALE
1 : 10

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

Golder Associates

PROJECT No.: 1657709 / 5000

RECORD OF HAND DUG: K19-HD17-02

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19

DRILLING DATE: July 16, 2017

DATUM: Geodetic

N: ~6399055 E: ~503379
Note: Northing and Easting Coordinates have been determined by GPS in the field and are approximate only.

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm ⊕ (10 20 30 40) / MiniRae 3000 ppm □ (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % Wp W Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		Ground Surface														
0	Hand Dug	**(ML/GP)** SILT and GRAVEL, trace fine sand; brown, no odour, no staining; cohesive, w<PL.		0.00												
		- metal debris at ~0.4m		0.40						1	03776-02	⊕				
		End of Hand Dug. (Refusal)														
1																
2																

DEPTH SCALE
1 : 10

Golder Associates

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

National IM Server:GINT_GAL_NATIONALIM Unique Project ID: Output Form:BC_BOREHOLE (GEOENVIRO) RY:James 14/11/17

PROJECT No.: 1657709 / 5000

RECORD OF HAND DUG: K19-HD17-03

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19

DRILLING DATE: July 16, 2017

DATUM: Geodetic

N: ~6399043 E: ~503360
Note: Northing and Easting Coordinates have been determined by GPS in the field and are approximate only.

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
0		Ground Surface														
	Hand Dug	**(ML/GW)** SILT and GRAVEL, trace fine sand; brown, no odour, no staining; cohesive, w~PL.		0.00												
		End of Hand Dug. (Refusal)		0.35						1	03776-03					
1																
2																

DEPTH SCALE
1 : 10

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

Golder Associates

PROJECT No.: 1657709 / 5000

RECORD OF HAND DUG: K19-HD17-04

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19

DRILLING DATE: July 16, 2017

DATUM: Geodetic

N: ~6399034 E: ~503353
Note: Northing and Easting Coordinates have been determined by GPS in the field and are approximate only.

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
0	Hand Dug	Ground Surface														
		(SW) SAND, with gravel, well graded, some silt; dark brown, no odour, no staining; non-cohesive, moist.		0.00												
										1	03776-04	⊕				
		End of Hand Dug. (Refusal)		0.41												
1																
2																

DEPTH SCALE
1 : 10

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: AW
CHECKED: EOB

Golder Associates

PROJECT No.: 1657709 / 5000

RECORD OF HAND DUG: K19-HD17-05

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19

DRILLING DATE: July 16, 2017

DATUM: Geodetic

N: ~6398841 E: ~503233
Note: Northing and Easting Coordinates have been determined by GPS in the field and are approximate only.

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm ⊕ (10 20 30 40) / MiniRae 3000 ppm □ (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % Wp W Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
0		Ground Surface														
	Hand Dug	**(SW/GW)** SAND and GRAVEL, fine to coarse sand, fine gravel, some silt; dark brown, no odour, no staining; non-cohesive, moist.		0.00												
		End of Hand Dug. Reached Target Depth.		0.38						1	03776-05					
1																
2																

DEPTH SCALE
1 : 10

Golder Associates

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

PROJECT No.: 1657709 / 5000

RECORD OF HAND DUG: K19-HD17-06

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19

DRILLING DATE: July 16, 2017

DATUM: Geodetic

N: ~6398844 E: ~503244
Note: Northing and Easting Coordinates have been determined by GPS in the field and are approximate only.

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
0	Hand Dug	Ground Surface														
		(ML) CLAYEY SILT, contains rootlets; light brown, no odour, no staining; cohesive, w<PL		0.00												
		End of Hand Dug. Reached Target Depth.		0.40						1	03776-06	⊕				
1																
2																

DEPTH SCALE
1 : 10

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: AW/KDB
CHECKED: EOB

Golder Associates

PROJECT No.: 1657709 / 5000

RECORD OF HAND DUG: K19-HD17-07

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19

DRILLING DATE: July 16, 2017

DATUM: Geodetic

N: ~6398854 E: ~503240
Note: Northing and Easting Coordinates have been determined by GPS in the field and are approximate only.

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm ⊕ (10 20 30 40) / MiniRae 3000 ppm □ (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % Wp W Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		Ground Surface														
0	Hand Dug	**(SW/GW)** SAND and GRAVEL, some silt; brown, no odour, no staining; non-cohesive, moist.		0.00												
		End of Hand Dug. (Refusal)		0.28						1	03776-07	⊕				
1																
2																

DEPTH SCALE
1 : 10

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: AW/KDB
CHECKED: EOB

Golder Associates

National IM Server:GINT_GAL_NATIONALIM Unique Project ID: Output Form:BC_BOREHOLE (GEOENVIRO) RY:James 14/11/17

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6399055.55 E: 503305.54

RECORD OF TEST PIT: K19-TP17-51

EXCAVATION DATE: July 14, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

6.5 m Length x 2.1 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
		Ground Surface		856.98									
0	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, some fine sand; light brown, no staining, no odour; cohesive, w<PL, firm.		0.00				⊕	1	03796-01			
				855.98									
1		Highly weathered (W4), grey-brown, no staining, no odour, extremely weak, SILTSTONE.	× ×	1.00				⊕	2	03796-02			
				854.88									
2		Moderately to highly weathered (W4-W5), dark brown with some iron staining, no odour, extremely weak, SILTSTONE.	× ×	2.10				⊕	3	03796-03			
				853.68									
3		Moderately weathered (W3), dark brown with iron staining, no odour, very weak, SILTSTONE.	× ×	3.30				⊕	4	03796-04			
				852.68									
4		Slightly to moderately weathered (W2-W3), black-brown, no staining, no odour, very weak, SILTSTONE.	× ×	4.30									Seepage
				852.08									
5		End of Test Pit. Reached Target Depth.		4.90				⊕	5	03796-05			
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6399012.31 E: 503320.93

RECORD OF TEST PIT: K19-TP17-52

EXCAVATION DATE: July 14, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

6.1 m Length x 1.9 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (⊕: 10 20 30 40; □: 50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
0		Ground Surface		857.71									
	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, some fine to coarse sand, organic matter and rootlets; black, no staining, very slight hydrocarbon odour; cohesive, w<PL, firm.		0.00									
				856.71				⊕	1	03796-06/03796-07			
1		Highly to completely weathered (W4-W5), dark grey-brown, no staining, no odour, extremely weak, SILTSTONE.	× ×	1.00									
				855.41				⊕	2	03796-08			
2		Moderately to highly weathered (W3-W4), brown-black, slight iron staining, no odour, extremely weak, SILTSTONE.	× ×	2.30									
				854.41				⊕	3	03796-09			
3		Slightly weathered (W2), dark grey, no staining, no odour, very weak, SILTSTONE.	× ×	3.30									
				853.71				⊕	4	03796-10			Seepage
4		End of Test Pit. Reached Target Depth.		4.00									
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398994.67 E: 503299.59

RECORD OF TEST PIT: K19-TP17-53

EXCAVATION DATE: July 14, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

4.6 m Length x 2.7 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
0		Ground Surface		857.93									
	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, some fine to coarse sand; light brown, no staining, no odour; cohesive, w<PL, firm.		0.00					1	03796-11			
1				856.53									
		Highly to completely weathered (W4-W5), brown-black, no staining, no odour, extremely weak, SILTSTONE.	× ×	1.40					2	03796-12			
2				855.63									
		Moderately weathered (W3), brown, some iron staining, no odour, very weak, SILTSTONE.	× ×	2.30					3	03820-01			
3				854.73									
		Slightly to moderately weathered (W2-W3), black-brown, some iron staining, no odour, SILTSTONE.	× ×	3.20									
4				853.93					4	03820-02			
		End of Test Pit. (Refusal)		4.00									
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398895.97 E: 503219.10

RECORD OF TEST PIT: K19-TP17-54

EXCAVATION DATE: July 14, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

5.2 m Length x 2.4 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm ⊕ (10 20 30 40) / MiniRae 3000 ppm □ (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
		Ground Surface		860.54									
0	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, some fine to coarse sand; brown-beige, no staining, no odour; cohesive, w<PL, firm.		0.00				⊕	1	03820-03/03820-04			
1				859.04									
		Highly weathered (W4), grey-brown, no staining, no odour, extremely weak, SILTSTONE.	× ×	1.50				⊕	2	03820-05			
2				857.74									
		Slightly to moderately weathered (W2-W3), dark grey with iron staining, no odour, very weak, SILTSTONE.	× ×	2.80				⊕	3	03820-06			Seepage
3				857.04									
		Slightly weathered (W2), grey-black, no staining, no odour, very weak, SILTSTONE.	× ×	3.50									
4				856.54									
		End of Test Pit. Reached Target Depth.		4.00				⊕	4	03820-07			
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398937.12 E: 503129.95

RECORD OF TEST PIT: K19-TP17-55

EXCAVATION DATE: July 14, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

5.8 m Length x 2.3 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
0		Ground Surface		854.41									
	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, rootlets; brown, no staining, no odour; cohesive, w<PL, firm.		0.00					1	03820-08			
1				853.41									
		Completely weathered (W5), grey-brown, no staining, no odour, extremely weak, SILTSTONE.		1.00					2	03820-09			
2				852.11									
		Moderately to highly weathered (W3-W4), brown-black, no staining, no odour, extremely weak, SILTSTONE.		2.30					3	03820-10			
3				851.01									
		Slightly weathered (W2), grey with iron staining, no odour, very weak, SILTSTONE.		3.40									
4				850.41					4	03820-11			
		End of Test Pit. Reached Target Depth.		4.00									
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398941.51 E: 503163.31

RECORD OF TEST PIT: K19-TP17-56

EXCAVATION DATE: July 15, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

5.9 m Length x 2.3 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) ⊕ / MiniRae 3000 ppm (50 100 150 200) □	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
0		Ground Surface		857.29									
	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, rootlets; brown-beige, no staining, no odour; cohesive, w<PL, firm.		0.00				⊕	1	03821-01			
1				856.09									
		Completely weathered (W5), grey-brown, no staining, no odour, extremely weak, SILTSTONE.	× ×	1.20				⊕	2	03821-02			
			× ×	855.49									
2		Moderately to highly weatherd (W3-W4), brown, no staining, no odours, extremely weak, SILTSTONE.	× ×	1.80				⊕	3	03821-03			
3			× ×	853.69									
		Slightly to moderately weathered (W2-W3), brown-grey with iron staining, no odour, very weak, SILTSTONE.	× ×	3.60									
			× ×	853.29									
4		End of Test Pit. Reached Target Depth.		4.00				⊕	4	03821-04			
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398953.67 E: 503152.07

RECORD OF TEST PIT: K19-TP17-57

EXCAVATION DATE: July 15, 2017

INCLINATION: -90°

DATUM: Geodetic

TEST PIT DIMENSIONS:

6.8 m Length x 2.4 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (⊕: 10 20 30 40; □: 50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
0		Ground Surface		855.79									
	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT; brown with iron staining, no odour; cohesive, w<PL, firm.		0.00				⊕	1	03821-05/0381-06			
1				854.59									
		Completely weathered (W5), dark brown, no staining, no odour, extremely weak, SILTSTONE.	× ×	1.20				⊕	2	03821-07			
2				853.49									
		Highly weathered (W4), dark brown, no staining, no odours, extremely weak, SILTSTONE.	× ×	2.30				⊕	3	03821-08			
3				852.49									
		Slightly to moderately weathered (W2-W3), brown-black, no staining, no odour, very weak, SILTSTONE.	× ×	3.30									
4				851.79				⊕	4	03821-09			
		End of Test Pit. Reached Target Depth.		4.00									
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398607.03 E: 502994.01

RECORD OF TEST PIT: K19-TP17-58

EXCAVATION DATE: July 15, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

5.9 m Length x 2.3 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
0		Ground Surface		860.41									
0	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT; brown, no odours; cohesive, w<PL, firm.		0.00				⊕	1	03821-10			
1				859.31									
1		Completely weathered (W5), dark brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	1.10				⊕	2	03821-11			
2			× ×	858.21									
2		Moderately to highly weathered (W3-W4), brown with iron staining, no odour, extremely weak, SILTSTONE.	× ×	2.20				⊕	3	03821-12			
3			× ×	857.01									
3		Slightly to moderately weathered (W2-W3), dark brown with iron staining, no odour, very weak, SILTSTONE.	× ×	3.40									
4			× ×	856.41				⊕	4	03822-01			
4		End of Test Pit. Reached Target Depth.		4.00									
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398627.19 E: 503009.52

RECORD OF TEST PIT: K19-TP17-59

EXCAVATION DATE: July 15, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

5.8 m Length x 2.4 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
		Ground Surface		859.73									
0	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, some fine to coarse sand; brown-black, no odour, no staining; cohesive, w<PL, firm.		0.00				⊕	1	03822-02/03822-03			
1				858.63									
		Completely weathered (W5), brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	1.10				⊕	2	03822-04			
2				857.43									
		Moderately to highly weathered (W3-W4), brown with iron staining, no odour, extremely weak, SILTSTONE.	× ×	2.30				⊕	3	03822-05			
3				856.73									
		Slightly weathered (W2), black-brown, no odour, no staining, very weak, SILTSTONE.	× ×	3.00									
4				855.73				⊕	4	03822-06			
		End of Test Pit. Reached Target Depth.		4.00									
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398612.89 E: 502963.01

RECORD OF TEST PIT: K19-TP17-60

EXCAVATION DATE: July 16, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

6 m Length x 2.3 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
0		Ground Surface		857.95									
	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, some fine to coarse sand; brown, no odour, no staining; cohesive, w<PL, firm.		0.00				⊕	1	03822-07			
				857.05									
1		Completely weathered (W5), brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	0.90				⊕	2	03822-08			
			× ×	856.15									
2		Moderately to highly weathered (W3-W4), brown with iron staining, no odour, extremely weak, SILTSTONE.	× ×	1.80				⊕	3	03822-09			
			× ×	855.15									
3		Moderately weathered (W3), dark brown with iron staining, no odour, extremely weak, SILTSTONE.	× ×	2.80				⊕	4	03822-10			
			× ×	854.05									
4		Slightly weathered (W2), dark grey with iron staining, no odour, very weak, SILTSTONE.	× ×	3.90				⊕	5	03822-11			
			× ×	853.75									
		End of Test Pit. Reached Target Depth.		4.20									
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398642.76 E: 502989.42

RECORD OF TEST PIT: K19-TP17-61

EXCAVATION DATE: July 16, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

5.8 m Length x 2.4 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
0		Ground Surface		857.77									
	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, some fine to coarse sand; brown, no odour, no staining; cohesive, w<PL, firm.		0.00				⊕	1	03822-12			
1				856.77									
		Completely weathered (W5) brown, very slight hydrocarbon-like odour, no staining, extremely weak, SILTSTONE.	× ×	1.00				⊕	2	03823-01			
2			× ×	855.77									
		Moderately to highly weathered (W3-W4), dark brown, no staining, no odour, extremely weak, SILTSTONE.	× ×	2.00				⊕	3	03823-02			
3			× ×	854.67									
		Slightly to moderately weathered (W2-W3), dark grey with iron staining, no odour, very weak, SILTSTONE.	× ×	3.10				⊕	4	03823-03			Seepage
4			× ×	853.67									
		Slightly to moderately weathered (W2-W3), dark grey, no odour, no staining, very weak, SILTSTONE.	× ×	4.10				⊕	5	03823-04			
		End of Test Pit. Reached Target Depth.		4.40									
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398998.43 E: 503313.96

RECORD OF TEST PIT: K19-TP17-62

EXCAVATION DATE: July 16, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

6.1 m Length x 2.4 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (⊕: 10 20 30 40; □: 50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
		Ground Surface		857.59									
0	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, some fine to coarse sand; brown with beige mottling, no odour, no staining; cohesive, w<PL, firm.		0.00 / 856.69				⊕	1	03823-05/03823-06			
1		Completely weathered (W5) brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	0.90 / 856.19									
		Moderately to highly weathered (W3-W4), dark brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	1.40 / 854.79				⊕	2	03823-07			
2								⊕	3	03823-08			
3		Moderately weathered (W3), dark brown with iron staining, no odour, extremely weak, SILTSTONE.	× ×	2.80 / 853.69				⊕	4	03823-09			
4		Slightly to moderately weathered (W2-W3), dark brown, no staining, no odour, very weak, SILTSTONE.	× ×	3.90 / 853.39				⊕	5	03823-10			
		End of Test Pit. Reached Target Depth.		4.20									
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398907.91 E: 503187.92

RECORD OF TEST PIT: K19-TP17-63

EXCAVATION DATE: July 16, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

6.3 m Length x 2.4 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
0		Ground Surface		859.96									
	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, some fine to coarse sand; brown, no odour, no staining; cohesive, w<PL, firm.		0.00				⊕	1	03823-11			
1				858.76									
		Highly weathered (W4), dark brown, hydrocarbon-like odour, no staining, extremely weak, SILTSTONE.	× ×	1.20				□	2	03823-12			
2				857.66									
		Moderately weathered (W3), dark brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	2.30				⊕	3	03824-01			
3				856.66									
		Slightly to moderately weathered (W2-W3), dark brown with iron staining, no odour, extremely weak, SILTSTONE.	× ×	3.30									
4				855.96				⊕	4	03824-02			
		End of Test Pit. Reached Target Depth.		4.00									
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398650.91 E: 503051.54

RECORD OF TEST PIT: K19-TP17-64

EXCAVATION DATE: July 17, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

6.1 m Length x 2.5 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm ⊕ (10 20 30 40) / MiniRae 3000 ppm □ (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
		Ground Surface		861.75									
0	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, some fine to coarse sand, rootlets; brown, no odour, no staining; cohesive, w~PL, firm.		0.00 860.95				⊕	1	03824-03			
1		Highly to completely weathered (W4-W5), dark brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	0.80 859.65				⊕	2	03824-04			
2		Moderately weathered (W3), dark brown with iron staining, no odour, extremely weak, SILTSTONE.	× ×	2.10 858.25				⊕	3	03824-05			
3		Slightly to moderately weathered (W2-W3), black with iron staining, no odour, very weak, SILTSTONE.	× ×	3.50 857.55									Seepage
4		End of Test Pit. Reached Target Depth.		4.20				⊕	4	03824-06			
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398924.67 E: 503178.69

RECORD OF TEST PIT: K19-TP17-65

EXCAVATION DATE: July 17, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

5.8 m Length x 2 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
0		Ground Surface		858.51									
	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, some fine to coarse sand, rootlets; brown, no odour, no staining; cohesive, w<PL, firm.		0.00 857.51					1	03824-07			
1		Moderately to highly weathered (W3-W4), dark brown, no odour, no staining, extremely weak, SILTSTONE.		1.00 856.41					2	03824-08/03824-09			
2		Moderately weathered (W3), dark brown, no odour, no staining, extremely weak, SILTSTONE.		2.10 855.21					3	03824-10			
3		Slightly weathered (W2), black, no odour, no staining, very weak, SILTSTONE.		3.30 854.41									Seepage
4		End of Test Pit. Reached Target Depth.		4.10					4	03824-11			
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398673.78 E: 503080.07

RECORD OF TEST PIT: K19-TP17-66

EXCAVATION DATE: July 17, 2017

INCLINATION: -90°

DATUM: Geodetic

TEST PIT DIMENSIONS:

6.5 m Length x 2.1 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
		Ground Surface		862.49									
0	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, some fine to coarse sand, rootlets; brown, no odour, no staining; cohesive, w<PL, firm.		0.00				⊕	1	03824-12			
1				861.39									
		Highly weathered (W4), brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	1.10				⊕	2	03825-01			
2				860.39									
		Moderately weathered (W3), dark brown with heavy iron staining, no odour, extremely weak, SILTSTONE.	× ×	2.10				⊕	3	03825-02			
3				859.19									
		Slightly weathered (W2), grey-black, no odour, no staining, very weak, SILTSTONE.	× ×	3.30									Seepage
4				858.39									
		End of Test Pit. Reached Target Depth.		4.10				⊕	4	03825-03			
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398712.14 E: 503010.17

RECORD OF TEST PIT: K19-TP17-67

EXCAVATION DATE: July 17, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

7.1 m Length x 2.1 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
		Ground Surface		856.53									
0	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, some fine to coarse sand, rootlets; brown, no odour, no staining; cohesive, w<PL, firm.		0.00					1	03825-04			
				855.73									
1		Highly to completely weathered (W4-W5), dark-brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	0.80					2	03825-05/03825-06			
				854.53									
2		Moderately to highly weathered (W3-W4), dark brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	2.00					3	03825-07			
3				853.23									
		Slightly to moderately weathered (W2-W3), dark-brown with iron staining, no odour, very weak, SILTSTONE.	× ×	3.30									
4				852.43					4	03825-08			
		End of Test Pit. Reached Target Depth.		4.10									
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398882.93 E: 503170.62

RECORD OF TEST PIT: K19-TP17-68

EXCAVATION DATE: July 18, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

5.9 m Length x 2.5 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
0		Ground Surface		860.66									
	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, some fine to coarse sand, rootlets; brown, no odour, no staining; cohesive, w<PL, firm.		0.00				⊕	1	03825-09			
1				859.66									
		Highly to completely weathered (W4-W5), dark-brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	1.00				⊕	2	03825-10			
2				858.66									
		Moderately weathered (W3), dark brown, hydrocarbon-like odour, no staining, extremely weak, SILTSTONE.	× ×	2.00				271.4 □	3	03825-11			
3				857.56									
		Slightly to moderately weathered (W2-W3), brown-black with iron staining, no odour, extremely weak, SILTSTONE.	× ×	3.10				⊕	4	03825-12			
				856.86									
4		Slightly weathered (W2), black-grey, no odour, no staining, very weak, SILTSTONE.	× ×	3.80									
				856.56				⊕	5	03826-01			
		End of Test Pit. Reached Target Depth.		4.10									
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6399029.71 E: 503209.47

RECORD OF TEST PIT: K19-TP17-69

EXCAVATION DATE: July 18, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

7.1 m Length x 2.1 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
0		Ground Surface		854.77									
	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, some fine to coarse sand; brown-grey, no odour, no staining; cohesive, w<PL, firm.		0.00 853.97				⊕	1	03826-02			
1		Moderately weathered (W3), dark-brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	0.80 852.37				⊕	2	03826-03			
2		Slightly to moderately weathered (W2-W3), dark brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	2.40 851.17				⊕	3	03826-04			
3		Slightly to moderately weathered (W2-W3), dark grey, no odour, no staining, extremely weak, SILTSTONE.	× ×	3.60 850.67				⊕	4	03826-05			
4		Slightly weathered (W2), black, no odour, no staining, very weak, SILTSTONE.	× ×	4.10 849.67				⊕	5	03826-06			
5		End of Test Pit. Reached Target Depth.		5.10									
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6399012.36 E: 503220.16

RECORD OF TEST PIT: K19-TP17-70

EXCAVATION DATE: July 18, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

6.8 m Length x 2.3 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
		Ground Surface		855.40									
0	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, some fine to coarse sand; brown, no odour, no staining; cohesive, w<PL, firm.		0.00				⊕	1	03826-07/03826-08			
1				854.20									
		Moderately weathered (W3), brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	1.20				⊕	2	03826-09			
2			× ×	853.30									
		Slightly to moderately weathered (W2-W3), grey-brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	2.10				⊕	3	03826-10			
3								⊕	4	03826-11			
4			× ×	851.30									
		Slightly weathered (W2), black-brown, no odour, no staining, very weak, SILTSTONE.	× ×	4.10									
			× ×	850.50				⊕	5	03826-12			
5		End of Test Pit. (Refusal)		4.90									
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398892.69 E: 503160.57

RECORD OF TEST PIT: K19-TP17-71

EXCAVATION DATE: July 18, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

0 m Length x 0 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (⊕: 10 20 30 40; □: 50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
		Ground Surface		860.01									
0	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, some fine sand; dark brown, no odour, no staining; cohesive, w<PL, firm.		0.00				⊕	1	03827-01			
1				858.81									
		Moderately weathered (W3), brown with iron staining, no odour, extremely weak, SILTSTONE.	× ×	1.20				⊕	2	03827-02			
2			× ×	857.91									
		Slightly to moderately weathered (W2-W3), dark-brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	2.10				⊕	3	03827-03/03827-04			
3			× ×	856.71									
		Slightly weathered (W2), dark grey, no odour, no staining, very weak, SILTSTONE.	× ×	3.30									
4			× ×	855.81				⊕	4	03827-05			
		End of Test Pit. Reached Target Depth.		4.20									
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

RECORD OF TEST PIT: K19-TP17-72

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6399115.55 E: 503407.52

EXCAVATION DATE: July 19, 2017

INCLINATION: -90°

DATUM: Geodetic

TEST PIT DIMENSIONS:
6.8 m Length x 2.3 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	GEOTECH SAMPLES NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm ⊕ (10 20 30 40) / MiniRae 3000 ppm □ (50 100 150 200)	CHEMISTRY ANALYSIS NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
		Ground Surface		857.58									
0	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, some fine sand; brown, no odour, no staining; cohesive, w<PL, firm.		0.00				⊕	1	03827-06			Seepage ≈
1		Moderately to highly weathered (W3-W4), dark brown, no odour, no staining, extremely weak, SILTSTONE.		856.58 1.00				⊕	2	03827-07			
2		Slightly to moderately weathered (W2-W3), dark-grey, no odour, no staining, very weak, SILTSTONE.		855.48 2.10				⊕	3	03827-08			
3													
4		End of Test Pit. Reached Target Depth.		853.58 4.00				⊕	4	03827-09			
5													
6													

DEPTH SCALE
1 : 50

LOGGED: MZ
CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6399094.02 E: 503390.60

RECORD OF TEST PIT: K19-TP17-73

EXCAVATION DATE: July 19, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

5.8 m Length x 2.3 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
0		Ground Surface		856.80									
	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT; brown, no odour, no staining; cohesive, w<PL, firm.		0.00				⊕	1	03827-10			
				856.00									
1		Moderately to highly weathered (W3-W4), dark brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	0.80				⊕	2	03827-11			Seepage
2			× ×	854.70									
		Slightly to moderately weathered (W2-W3), dark brown with iron staining, no odour, very weak, SILTSTONE.	× ×	2.10				⊕	3	03827-12			
			× ×	854.30									
		End of Test Pit. Reached Target Depth		2.50									
3													
4													
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

National IM Server:GINT_GAL_NATIONALIM Unique Project ID: Output Form:BC_TESTPIT WITH PHOTO (ENVIRO) RY:James 27/10/17

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398468.63 E: 502977.77

RECORD OF TEST PIT: K19-TP17-74

EXCAVATION DATE: July 20, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

6.5 m Length x 2.2 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
		Ground Surface		861.66									
0	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT; brown, no odour, no staining; cohesive, w<PL, firm.		0.00					1	03828-01			
1				860.46									
		Highly to completely weathered (W4-W5), dark brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	1.20					2	03828-02/03828-03			
2			× ×	859.66									
		Moderately weathered (W3), dark-brown with iron staining, no odour, extremely weak, SILTSTONE.	× ×	2.00					3	03828-04			
			× ×	858.86									
3		Slightly to moderately weathered (W2-W3), black-brown, no odour, no staining, very weak, SILTSTONE.	× ×	2.80					4	03828-05			
			× ×	858.46									
		End of Test Pit. Reached Target Depth.		3.20									
4													
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398457.66 E: 502977.08

RECORD OF TEST PIT: K19-TP17-75

EXCAVATION DATE: July 20, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

6.8 m Length x 2.3 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
0		Ground Surface		861.62									
	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT; brown, no odour, no staining; cohesive, w<PL, firm.		0.00				⊕	1	03828-06			
1				860.42									
		Highly to completely weathered (W4-W5), dark brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	1.20				⊕	2	03828-07			
			× ×	859.62									
2		Moderately to highly weathered (W3-W4), brown-grey, no odour, no staining, extremely weak, SILTSTONE.	× ×	2.00				⊕	3	03828-08			
			× ×	858.92									
		Slightly to moderately weathered (W2-W3), dark grey, no odour, no staining, very weak, SILTSTONE.	× ×	2.70				⊕	4	03828-09			
3			× ×	858.62									
		End of Test Pit. Reached Target Depth.		3.00									
4													
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398479.97 E: 502984.67

RECORD OF TEST PIT: K19-TP17-76

EXCAVATION DATE: July 20, 2017

INCLINATION: -90°

DATUM: Geodetic

TEST PIT DIMENSIONS:

7.1 m Length x 2.3 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
		Ground Surface		861.86									
0	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT; brown, no odour, no staining; cohesive, w<PL, firm.		0.00				⊕	1	03828-10			
1				860.66									
		Highly to completely weathered (W4-W5), dark brown, no odour, no staining, extremely weak, SILTSTONE.	× × × × × × × × × × × × × ×	1.20				⊕	2	03828-11/03828-12			
2				859.86									
		Moderately weathered (W3), dark brown with iron staining, no odour, extremely weak, SILTSTONE.	× × × × × × × × × × × × × ×	2.00				⊕	3	03829-01			
				859.06									
3		Slightly to moderately weathered (W2-W3), dark grey, no odour, no staining, very weak, SILTSTONE.	× × × × × × × ×	2.80									
				858.66				⊕	4	03829-02			
		End of Test Pit. Reached Target Depth.		3.20									
4													
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398431.72 E: 503028.46

RECORD OF TEST PIT: K19-TP17-77

EXCAVATION DATE: July 20, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

6.8 m Length x 2.4 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
0		Ground Surface		861.93									
	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT; dark brown, no odour, no staining; cohesive, w<PL, firm.		0.00				⊕	1	03829-03			
1				860.93									
		Completely weathered (W5), dark brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	1.00				⊕	2	03829-04			
2			× ×	859.83									
		Highly weathered (W4), black-brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	2.10				⊕	3	03829-05			
3			× ×	858.93									
		Slightly to moderately weathered (W2-W3), black-brown, no odour, no staining, very weak, SILTSTONE.	× ×	3.00				⊕	4	03829-06			
		End of Test Pit. Reached Target Depth.		858.63									
				3.30									
4													
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398433.51 E: 503005.27

RECORD OF TEST PIT: K19-TP17-78

EXCAVATION DATE: July 20, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

6.8 m Length x 2.4 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
0		Ground Surface		861.73									
	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT; dark brown, no odour, no staining; cohesive, w<PL, firm.		0.00				⊕	1	03829-07			
1				860.53									
		Completely weathered (W5), dark brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	1.20				⊕	2	03829-08			
2				859.53									
		Slightly to moderately weathered (W2-W3), grey-brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	2.20				⊕	3	03829-09			
				858.83									
3		Slightly weathered (W2), grey-black, no odour, no staining, very weak, SILTSTONE.	× ×	2.90				⊕	4	03829-10			Seepage
				858.53									
		End of Test Pit. Reached Target Depth.		3.20									
4													
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398994.06 E: 503220.55

RECORD OF TEST PIT: K19-TP17-79

EXCAVATION DATE: July 20, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

6.7 m Length x 2.2 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (⊕: 10 20 30 40; □: 50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
		Ground Surface		855.92									
0	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT; dark brown, no odour, no staining; cohesive, w<PL, firm.		0.00				⊕	1	03829-11			
				855.12									
1		Moderately to highly weathered (W3-W4), dark brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	0.80				⊕	2	03829-12/03840-01			
				854.12									
2		Slightly weathered (W2), dark brown, no odour, no staining, very weak, SILTSTONE.	× ×	1.80				⊕	3	03840-02			
3				852.92				⊕	4	03840-03			
		End of Test Pit. (Refusal)		3.00									
4													
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398641.49 E: 502982.25

RECORD OF TEST PIT: K19-TP17-80

EXCAVATION DATE: July 21, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

7.3 m Length x 2.2 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
		Ground Surface		857.32									
0	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT; dark brown, no odour, no staining; cohesive, w<PL, firm.		0.00					1	03840-04			
				856.42									
1		Completely weathered (W5), brown, no odour, no staining, extremely weak, SILTSTONE.		0.90					2	03840-05			
				855.32									
2		Highly weathered (W4), brown with iron staining, hydrocarbon-like odour, extremely weak, SILTSTONE.		2.00					3	03840-06			
				854.12									
3		Slightly to moderately weathered (W2-W3), grey-brown with iron staining, no odour, extremely weak, SILTSTONE.		3.20					4	03840-07			
				853.32									
4		Slightly weathered (W2) dark grey, no odour, no staining, very weak, SILTSTONE		4.00					5	03840-08			
				853.02									
		End of Test Pit. Reached Target Depth.		4.30									
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398640.46 E: 502971.31

RECORD OF TEST PIT: K19-TP17-81

EXCAVATION DATE: July 21, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

6.8 m Length x 2.3 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
		Ground Surface		856.62									
0	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, some fine sand; brown, no odour, no staining; cohesive, w<PL, firm.		0.00				⊕	1	03840-09			
1				855.42									
		Highly weathered (W4), brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	1.20				⊕	2	03840-10			
2			× ×	854.42									
		Moderately weathered (W3), dark brown, very slight hydrocarbon-like odour, no staining, extremely weak, SILTSTONE.	× ×	2.20				⊕	3	03840-11			
3			× ×	853.62									
		Slightly weathered (W2), dark brown, no odour, no staining, very weak, SILTSTONE	× ×	3.00				⊕	4	03840-12			
			× ×	853.12									
		End of Test Pit. Reached Target Depth.		3.50									
4													
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398653.92 E: 502971.54

RECORD OF TEST PIT: K19-TP17-82

EXCAVATION DATE: July 21, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

6.8 m Length x 2.4 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
0		Ground Surface		856.04									
	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT; dark brown, no odour, no staining; cohesive, w<PL, firm.		0.00					1	03841-01			
1				855.04									
		Highly weathered (W4), dark brown, slight hydrocarbon-like odour, no staining, extremely weak, SILTSTONE.		1.00					2	03841-02/03841-03			
2				853.94									
		Moderately weathered (W3), dark brown with iron staining, no odour, extremely weak, SILTSTONE.		2.10					3	03841-04			
3				852.74									
		Slightly to moderately weathered (W2-W3), brown-black, no odour, no staining, very weak, SILTSTONE		3.30									
4				851.84					4	03841-05			
		End of Test Pit. Reached Target Depth.		4.20									
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398907.41 E: 503207.50

RECORD OF TEST PIT: K19-TP17-83

EXCAVATION DATE: July 21, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

6.9 m Length x 2.1 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
0		Ground Surface		860.33									
	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT; brown, no odour, no staining; cohesive, w<PL, firm.		0.00				⊕	1	03841-06			
1				859.33									
		Completely weathered (W5), brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	1.00				⊕	2	03841-07			
2				858.13									
		Moderately to highly weathered (W3-W4), brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	2.20				⊕	3	03841-08			
3				857.03									
		Slightly to moderately weathered (W2-W3), grey-brown, no odour, no staining, very weak, SILTSTONE	× ×	3.30				⊕	4	03841-09			
4				856.43									
		End of Test Pit. Reached Target Depth.		3.90									
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398878.47 E: 503155.15

RECORD OF TEST PIT: K19-TP17-84

EXCAVATION DATE: July 21, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

6.8 m Length x 1.9 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
0		Ground Surface		860.38									
	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, some fine to coarse sand; brown, no odour, no staining; cohesive, w<PL, firm.		0.00									
				859.58				⊕	1	03841-10/03841-11			
1		Highly to completely weathered (W4-W5), brown, no odour, no staining, extremely weak, SILTSTONE	× ×	0.80									
				858.48				⊕	2	03841-12			
2		Moderately weathered (W3), dark brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	1.90									
								⊕	3	03842-01			
3				857.18									
		Slightly weathered (W2), grey-brown, no odour, no staining, very weak, SILTSTONE	× ×	3.20									
				856.38									
4		End of Test Pit. Reached Target Depth.		4.00				⊕	4	03842-02			
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398633.02 E: 502997.73

RECORD OF TEST PIT: K19-TP17-85

EXCAVATION DATE: July 22, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

7.2 m Length x 2.1 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
		Ground Surface		858.40									
0	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, some fine sand; brown, no odour, no staining; cohesive, w<PL, firm.		0.00				⊕	1	03842-03			
1				857.30									
		Completely weathered (W5), brown, no odour, no staining, extremely weak, SILTSTONE	× ×	1.10				⊕	2	03842-04			
2			× ×	856.20									
		Moderately weathered (W3), black-brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	2.20				⊕	3	03842-05/03842-06			
3			× ×	855.10									
		Slightly to moderately weathered (W2-W3), dark-grey, no odour, no staining, very weak, SILTSTONE	× ×	3.30									
4			× ×	854.30				⊕	4	03842-07			
		End of Test Pit. Reached Target Depth.		4.10									
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398651.29 E: 502992.04

RECORD OF TEST PIT: K19-TP17-86

EXCAVATION DATE: July 22, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

6.9 m Length x 2.3 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm ⊕ (10 20 30 40) / MiniRae 3000 ppm □ (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
		Ground Surface		857.32									
0	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT, some fine sand; brown, no odour, no staining; cohesive, w<PL, firm.		0.00									Seepage
				856.42				⊕	1	03842-08			
1		Highly to completely weathered (W4-W5), brown, no odour, no staining, extremely weak, SILTSTONE	× ×	0.90									
								⊕	2	03842-09			
2				855.02									
		Moderately weathered (W3), grey-brown with iron staining, no odour, extremely weak, SILTSTONE.		2.30									
								⊕	3	03842-10			
3				853.92									
		Slightly to moderately weathered (W2-W3), dark-grey, no odour, no staining, very weak, SILTSTONE		3.40									
4				853.32									
		End of Test Pit. Reached Target Depth.		4.00				⊕	4	03842-11			
5													
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

PROJECT No.: 1657709 / 5000

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398907.53 E: 503297.56

RECORD OF TEST PIT: K19-TP17-87

EXCAVATION DATE: July 22, 2017

INCLINATION: -90°

SHEET 1 OF 1

DATUM: Geodetic

TEST PIT DIMENSIONS:

7.1 m Length x 2.3 m Width

DEPTH SCALE METRES	EXCAVATION METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	RECOVERY %	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	CHEMISTRY ANALYSIS: NUMBER	SCN	ANALYSED	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE, THERMISTOR INSTALLATION OR SEEPAGE OBSERVATION
0		Ground Surface		860.61									
	Deere 240D Excavator Bucket	**(ML)** CLAYEY SILT; brown, no odour, no staining; cohesive, w<PL, firm.		0.00				⊕	1	03842-12			Seepage
				859.71									
1		Highly to completely weathered (W4-W5), brown, no odour, no staining, extremely weak, SILTSTONE	× ×	0.90				⊕	2	03843-01			
2			× ×	858.41									
		Highly weathered (W4), brown, no odour, no staining, extremely weak, SILTSTONE.	× ×	2.20				⊕	3	03843-02			
3			× ×	857.21									
		Moderately to highly weathered (W3-W4), grey-brown, no odour, no staining, extremely weak, SILTSTONE	× ×	3.40				⊕	4	03843-03			
4			× ×	856.11									
		Slightly to moderately weathered (W2-W3), grey brown, no odour, no staining, very weak, SILTSTONE		4.50				⊕	5	03843-04			
				855.81									
5		End of Test Pit. (Refusal)		4.80									
6													

DEPTH SCALE

1 : 50

LOGGED: MZ

CHECKED: EOB

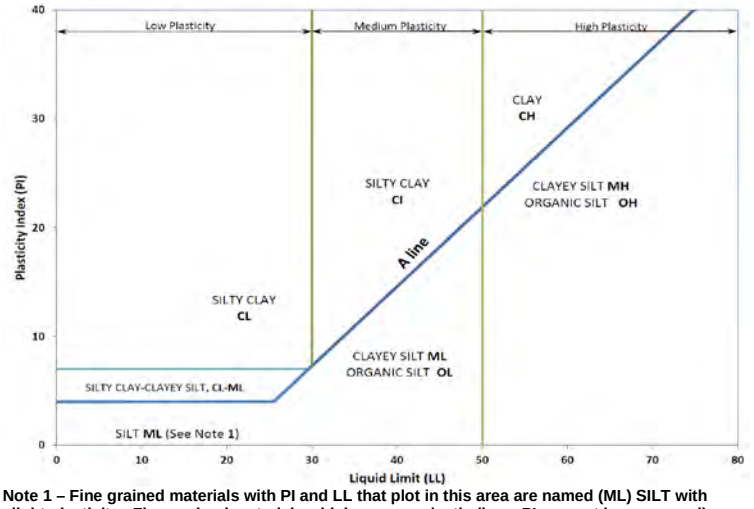
National IM Server:GINT_GAL_NATIONALIM Unique Project ID: Output Form:BC_TESTPIT WITH PHOTO (ENVIRO) RY:James 27/10/17

METHOD OF SOIL CLASSIFICATION

The Golder Associates Ltd. Soil Classification System is based on the Unified Soil Classification System (USCS)

Organic or Inorganic	Soil Group	Type of Soil		Gradation or Plasticity	$Cu = \frac{D_{60}}{D_{10}}$	$Cc = \frac{(D_{30})^2}{D_{10} x D_{60}}$	Organic Content	USCS Group Symbol	Group Name
INORGANIC (Organic Content ≤30% by mass)	COARSE-GRAINED SOILS (>50% by mass is larger than 0.075 mm)	GRAVELS (>50% by mass of coarse fraction is larger than 4.75 mm)	Gravels with ≤12% fines (by mass)	Poorly Graded	<4	≤1 or ≥3	≤30%	GP	GRAVEL
				Well Graded	≥4	1 to 3		GW	GRAVEL
			Gravels with >12% fines (by mass)	Below A Line	n/a			GM	SILTY GRAVEL
				Above A Line	n/a			GC	CLAYEY GRAVEL
		SANDS (≥50% by mass of coarse fraction is smaller than 4.75 mm)	Sands with ≤12% fines (by mass)	Poorly Graded	<6	≤1 or ≥3		SP	SAND
				Well Graded	≥6	1 to 3		SW	SAND
			Sands with >12% fines (by mass)	Below A Line	n/a			SM	SILTY SAND
				Above A Line	n/a			SC	CLAYEY SAND

Organic or Inorganic	Soil Group	Type of Soil		Laboratory Tests	Field Indicators					Organic Content	USCS Group Symbol	Primary Name
					Dilatancy	Dry Strength	Shine Test	Thread Diameter	Toughness (of 3 mm thread)			
INORGANIC (Organic Content ≤30% by mass)	FINE-GRAINED SOILS (≥50% by mass is smaller than 0.075 mm)	SILTS (Non-Plastic or PI and LL plot below A-Line on Plasticity Chart below)		Liquid Limit <50	Rapid	None	None	>6 mm	N/A (can't roll 3 mm thread)	<5%	ML	SILT
					Slow	None to Low	Dull	3mm to 6 mm	None to low	<5%	ML	CLAYEY SILT
					Slow to very slow	Low to medium	Dull to slight	3mm to 6 mm	Low	5% to 30%	OL	ORGANIC SILT
				Liquid Limit ≥50	Slow to very slow	Low to medium	Slight	3mm to 6 mm	Low to medium	<5%	MH	CLAYEY SILT
					None	Medium to high	Dull to slight	1 mm to 3 mm	Medium to high	5% to 30%	OH	ORGANIC SILT
		CLAYS (PI and LL plot above A-Line on Plasticity Chart below)		Liquid Limit <30	None	Low to medium	Slight to shiny	~ 3 mm	Low to medium	0% to 30% (see Note 2)	CL	SILTY CLAY
				Liquid Limit 30 to 50	None	Medium to high	Slight to shiny	1 mm to 3 mm	Medium		CI	SILTY CLAY
				Liquid Limit ≥50	None	High	Shiny	<1 mm	High		CH	CLAY
HIGHLY ORGANIC SOILS (Organic Content >30% by mass)		Peat and mineral soil mixtures								30% to 75%	PT	SILTY PEAT, SANDY PEAT
		Predominantly peat, may contain some mineral soil, fibrous or amorphous peat								75% to 100%		PEAT



Note 1 – Fine grained materials with PI and LL that plot in this area are named (ML) SILT with slight plasticity. Fine-grained materials which are non-plastic (i.e. a PL cannot be measured) are named SILT.
Note 2 – For soils with <5% organic content, include the descriptor "trace organics" for soils with between 5% and 30% organic content include the prefix "organic" before the Primary name.

Dual Symbol — A dual symbol is two symbols separated by a hyphen, for example, GP-GM, SW-SC and CL-ML.
For non-cohesive soils, the dual symbols must be used when the soil has between 5% and 12% fines (i.e. to identify transitional material between "clean" and "dirty" sand or gravel.
For cohesive soils, the dual symbol must be used when the liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart (see Plasticity Chart at left).

Borderline Symbol — A borderline symbol is two symbols separated by a slash, for example, CL/CI, GM/SM, CL/ML.
A borderline symbol should be used to indicate that the soil has been identified as having properties that are on the transition between similar materials. In addition, a borderline symbol may be used to ~~or~~ indicate~~s~~ a range of similar soil types within a stratum.

ABBREVIATIONS AND TERMS USED ON RECORDS OF BOREHOLES AND TEST PITS

PARTICLE SIZES OF CONSTITUENTS

Soil Constituent	Particle Size Description	Millimetres	Inches (US Std. Sieve Size)
BOULDERS	Not Applicable	>300	>12
COBBLES	Not Applicable	75 to 300	3 to 12
GRAVEL	Coarse Fine	19 to 75 4.75 to 19	0.75 to 3 (4) to 0.75
SAND	Coarse Medium Fine	2.00 to 4.75 0.425 to 2.00 0.075 to 0.425	(10) to (4) (40) to (10) (200) to (40)
SILT/CLAY	Classified by plasticity	<0.075	< (200)

MODIFIERS FOR SECONDARY AND MINOR CONSTITUENTS

Percentage by Mass	Modifier
>35	Use 'and' to combine major constituents (*i.e.,* SAND and GRAVEL, SAND and CLAY)
> 12 to 35	Primary soil name prefixed with "gravelly, sandy, SILTY, CLAYEY" as applicable
> 5 to 12	some
≤ 5	trace

PENETRATION RESISTANCE

Standard Penetration Resistance (SPT), N:

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) split-spoon sampler for a distance of 300 mm (12 in.).

Cone Penetration Test (CPT)

An electronic cone penetrometer with a 60° conical tip and a project end area of 10 cm^2 pushed through ground at a penetration rate of 2 cm/s. Measurements of tip resistance (q_t), porewater pressure (u) and sleeve frictions are recorded electronically at 25 mm penetration intervals.

Dynamic Cone Penetration Resistance (DCPT); N_d:

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) to drive uncased a 50 mm (2 in.) diameter, 60° cone attached to "A" size drill rods for a distance of 300 mm (12 in.).

PH: Sampler advanced by hydraulic pressure
PM: Sampler advanced by manual pressure
WH: Sampler advanced by static weight of hammer
WR: Sampler advanced by weight of sampler and rod

SAMPLES

AS	Auger sample
BS	Block sample
CS	Chunk sample
DO or DP	Seamless open ended, driven or pushed tube sampler – note size
DS	Denison type sample
FS	Foil sample
GS	Grab Sample
RC	Rock core
SC	Soil core
SS	Split spoon sampler – note size
ST	Slotted tube
TO	Thin-walled, open – note size
TP	Thin-walled, piston – note size
WS	Wash sample

SOIL TESTS

w	water content
PL , w_p	plastic limit
LL , w_L	liquid limit
C	consolidation (oedometer) test
CHEM	chemical analysis (refer to text)
CID	consolidated isotropically drained triaxial test[1]
CIU	consolidated isotropically undrained triaxial test with porewater pressure measurement[1]
D_R	relative density (specific gravity, Gs)
DS	direct shear test
GS	specific gravity
M	sieve analysis for particle size
MH	combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	organic content test
SO_4	concentration of water-soluble sulphates
UC	unconfined compression test
UU	unconsolidated undrained triaxial test
V (FV)	field vane (LV-laboratory vane test)
γ	unit weight

1. Tests which are anisotropically consolidated prior to shear are shown as CAD, CAU.

NON-COHESIVE (COHESIONLESS) SOILS

Compactness[2]

Term	SPT 'N' (blows/0.3m)[1]
Very Loose	0 - 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very Dense	>50

1. SPT 'N' in accordance with ASTM D1586, uncorrected for overburden pressure effects.
2. Definition of compactness descriptions based on SPT 'N' ranges from Terzaghi and Peck (1967) and correspond to typical average N_{60} values.

Field Moisture Condition

Term	Description
Dry	Soil flows freely through fingers.
Moist	Soils are darker than in the dry condition and may feel cool.
Wet	As moist, but with free water forming on hands when handled.

COHESIVE SOILS

Consistency

Term	Undrained Shear Strength (kPa)	SPT 'N'[1] (blows/0.3m)
Very Soft	<12	0 to 2
Soft	12 to 25	2 to 4
Firm	25 to 50	4 to 8
Stiff	50 to 100	8 to 15
Very Stiff	100 to 200	15 to 30
Hard	>200	>30

1. SPT 'N' in accordance with ASTM D1586, uncorrected for overburden pressure effects; approximate only.

Water Content

Term	Description
w < PL	Material is estimated to be drier than the Plastic Limit.
w ~ PL	Material is estimated to be close to the Plastic Limit.
w > PL	Material is estimated to be wetter than the Plastic Limit.

LIST OF SYMBOLS

Unless otherwise stated, the symbols employed in the report are as follows:

I. GENERAL

π	3.1416
ln x	natural logarithm of x
$\log_{10}$	x or log x, logarithm of x to base 10
g	acceleration due to gravity
t	time

II. STRESS AND STRAIN

γ	shear strain
Δ	change in, e.g. in stress: $\Delta\sigma$
ε	linear strain
ε_v	volumetric strain
η	coefficient of viscosity
υ	Poisson's ratio
σ	total stress
σ'	effective stress ($\sigma' = \sigma - u$)
σ'_{vo}	initial effective overburden stress
σ_1, σ_2, σ_3	principal stress (major, intermediate, minor)
σ_{oct}	mean stress or octahedral stress $= (\sigma_1 + \sigma_2 + \sigma_3)/3$
τ	shear stress
u	porewater pressure
E	modulus of deformation
G	shear modulus of deformation
K	bulk modulus of compressibility

III. SOIL PROPERTIES

(a) Index Properties

$\rho(\gamma)$	bulk density (bulk unit weight)*
$\rho_d(\gamma_d)$	dry density (dry unit weight)
$\rho_w(\gamma_w)$	density (unit weight) of water
$\rho_s(\gamma_s)$	density (unit weight) of solid particles
γ'	unit weight of submerged soil ($\gamma' = \gamma - \gamma_w$)
D_R	relative density (specific gravity) of solid particles ($D_R = \rho_s / \rho_w$) (formerly G_s)
e	void ratio
n	porosity
S	degree of saturation

* Density symbol is ρ. Unit weight symbol is γ where $\gamma = \rho g$ (i.e. mass density multiplied by acceleration due to gravity)

(a) Index Properties (continued)

w	water content
w_l or LL	liquid limit
w_p or PL	plastic limit
I_p or PI	plasticity index = $(w_l - w_p)$
w_s	shrinkage limit
I_L	liquidity index = $(w - w_p) / I_p$
I_C	consistency index = $(w_l - w) / I_p$
e_{max}	void ratio in loosest state
e_{min}	void ratio in densest state
I_D	density index = $(e_{max} - e) / (e_{max} - e_{min})$ (formerly relative density)

(b) Hydraulic Properties

h	hydraulic head or potential
q	rate of flow
v	velocity of flow
i	hydraulic gradient
k	hydraulic conductivity (coefficient of permeability)
j	seepage force per unit volume

(c) Consolidation (one-dimensional)

C_c	compression index (normally consolidated range)
C_r	recompression index (over-consolidated range)
C_s	swelling index
C_α	secondary compression index
m_v	coefficient of volume change
c_v	coefficient of consolidation (vertical direction)
c_h	coefficient of consolidation (horizontal direction)
T_v	time factor (vertical direction)
U	degree of consolidation
σ'_p	pre-consolidation stress
OCR	over-consolidation ratio = σ'_p / σ'_{vo}

(d) Shear Strength

τ_p, τ_r	peak and residual shear strength
ϕ'	effective angle of internal friction
δ	angle of interface friction
μ	coefficient of friction = tan δ
c′	effective cohesion
c_u, s_u	undrained shear strength ($\phi = 0$ analysis)
p	mean total stress $(\sigma_1 + \sigma_3)/2$
p′	mean effective stress $(\sigma'_1 + \sigma'_3)/2$
q	$(\sigma_1 - \sigma_3)/2$ or $(\sigma'_1 - \sigma'_3)/2$
q_u	compressive strength $(\sigma_1 - \sigma_3)$
S_t	sensitivity

Notes: 1 $\tau = c' + \sigma' \tan \phi'$

2 shear strength = (compressive strength)/2

APPENDIX D

Borehole Logs

PROJECT No.: 1657709 / 5000

RECORD OF MONITORING WELL: K19-MW17-17

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398918.65 E: 503287.20

DRILLING DATE: July 18, 2017
DRILLING CONTRACTOR: Tundra

DATUM: Geodetic

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		Ground Surface		859.92												0.73m Stick-up
0	D120 Truck Mounted Auger Drill / Solid Stem Auger (Casing:152 mm;)	**(ML)** CLAYEY SILT, some gravel; dark brown, no odour; cohesive, w<PL.		0.00						1	03831-01	⊕				
1				858.72												
		Highly weathered to completely weathered (W4-W5), dark brown, no odour, extremely weak, SILTSTONE. (Bedrock inferred from drill reaction)	× ×	1.20												
2										2	03831-02	⊕				
3										3	03831-03	⊕				Hydrated Bentonite Chips
				856.42												
		Highly weathered (W4), dark brown, no odour, very weak, SILTSTONE. (Bedrock inferred from drill reaction)	× ×	3.50												7/26/2017
4										4	03831-04	⊕				PVC Pipe
				855.42												
		Moderately weathered (W3), grey-brown, petroleum hydrocarbon-like odour, moist, SILTSTONE. (Bedrock inferred from drill reaction)	× ×	4.50												
5										5	03831-05			□329.1		
6		- no odour from 6m to end of hole.														
		- softer conditions at 6.5 and 7m based on drill response (Similar response to W3 bedrock).								6	03831-06		□			
7																Silica Sand 10/20 #10 Screen
8				851.82												
		End of Monitoring Well.		8.10												
9																
10																

DEPTH SCALE
1 : 50

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

Golder Associates

PROJECT No.: 1657709 / 5000

RECORD OF MONITORING WELL: K19-MW17-18

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398859.80 E: 503265.57

DRILLING DATE: July 19, 2017
DRILLING CONTRACTOR: Tundra

DATUM: Geodetic

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		Ground Surface		862.06												0.86m Stick-up
0	D120 Truck Mounted Auger Drill / Solid Stem Auger (Casing:152 mm;)	**(ML)** CLAYEY SILT, contains rootlets; brown, no odour; cohesive, w~PL.		0.00						1	03831-07/03831-08		⊕			
1				860.56												
2		Highly to completely weathered (W4-W5), brown, no odour, extremely weak, moist to dry, SILTSTONE. (Bedrock inferred from drill reaction)	×	1.50						2	03831-09		⊕			Hydrated Bentonite Chips
				859.46												
3		Moderately weathered (W3), pieces of siltstone gravel, grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)		2.60						3	03831-11		⊕			7/26/2017 ▼ PVC Pipe
4										4	03831-10		⊕			
5										5	03831-12		⊕			Silica Sand 10/20 #10 Screen
6		- highly weathered (W4), grey-brown, no odour, dry, SILTSTONE from 5.8 to 5.95m								6	03832-01		⊕			
7				854.56												
8		Slightly weathered (W2), grey-brown, no odour, SILTSTONE. (Bedrock inferred from drill reaction) - hydrocarbon-like odour from 7.5 to 10m - softer conditions observed from 8.0 to 8.15m based on drill response. (Similar response to W3 bedrock)		7.50						7	03832-02		□			
9																
10		- softer conditions observed from 9.5 to 9.7m snd 10.5 to 10.7m based on drill response. (Similar response to W4 bedrock)								8	03832-03		□			Hydrated Bentonite Chips
11													□			
12										10	03832-04		⊕			
13		End of Monitoring Well.		849.06 13.00												
14																
15																

DEPTH SCALE
1 : 75

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

Golder Associates

PROJECT No.: 1657709 / 5000

RECORD OF MONITORING WELL: K19-MW17-19

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6399125.07 E: 503402.10

DRILLING DATE: July 19, 2017
DRILLING CONTRACTOR: Tundra

DATUM: Geodetic

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
0	D120 Truck Mounted Auger Drill / Solid Stem Auger (Casing:152 mm;)	Ground Surface		857.14												
		(CL/GP) SILTY CLAY and GRAVEL; brown, no odour; cohesive, w>PL.		0.00 / 856.34						1	03832-05		⊕			
1		Completely to highly weathered (W4-W5), dark brown, no odour, moist, SILTSTONE. (Bedrock inferred from drill reaction)		0.80 / 855.84												Hydrated Bentonite Chips (Pellets from 3.8 to 4.8m)
		Highly to moderately weathered (W3-W4), grey-brown, no odour, moist, SILTSTONE. (Bedrock inferred from drill reaction)		1.30 / 855.14						2	03832-06		⊕			
2		Moderately weathered (W3), grey, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)		2.00												7/25/2017 ▼
3																
										3	03832-07		⊕			PVC Pipe
4																
5										4	03832-08/03832-09		⊕			
6																
		- softer conditions observed from 6.4 to 6.6m based on drill response. (Similar response to W3-W4 bedrock)								5	03832-10		⊕			Silica Sand 10/20 #10 Screen
7																
										6	03832-11		⊕			
8				848.94												
		End of Monitoring Well.		8.20												
9																
10																

0.66m Stick-up

DEPTH SCALE
1 : 50

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

Golder Associates

PROJECT No.: 1657709 / 5000

RECORD OF MONITORING WELL: K19-MW17-20

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398852.30 E: 503232.63

DRILLING DATE: July 20, 2017
DRILLING CONTRACTOR: Tundra

DATUM: Geodetic

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		Ground Surface		862.27												
0	D120 Truck Mounted Auger Drill / Solid Stem Auger (Casing:152 mm;)	**(SP/GP)** SAND and GRAVEL, some silt; brown, no odour; wet.		0.00						1	03833-01		⊕			0.62m Stick-up
				861.67												
		(CL) SILTY CLAY; grey-brown, no odour; cohesive, w>PL.		0.60												
1				861.07												
		Completely weathered to residual soil (W6-W5), grey-brown, no odour, moist, SILTSTONE. (Bedrock inferred from drill reaction)	× ×	1.20												7/25/2017 ▽
			× ×	860.27						2	03833-02		⊕			Hydrated Bentonite Chips
2		Highly weathered (W4), grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)	× ×	2.00												PVC Pipe
			× ×	859.27												
3		Highly to moderately weathered (W4-W3), grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)	× ×	3.00						3	03833-03		⊕			
4		- petroleum hydrocarbon-like odours from 4 to 7m	× ×													
		- softer conditions observed from 4.5 to 4.7m based on drill response. (Similar response to W4-W3 berock)	× ×	857.57												Silica Sand 10/20 #10 Screen
			× ×	4.70						4	03833-04		⊕			
5		Moderately weathered (W3), grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)	× ×	856.97												
				5.30												
		- softer conditions observed from 5.3 to 5.7m based on drill response. (Similar response to W3 berock)														
6										5	03833-05/03833-06		⊕			Hydrated Bentonite Pellets
		- softer conditions observed from 6.5 to 7m base on drill response. (Similar response to W3 bedrock)														
7		End of Monitoring Well.														
8																
9																
10																

DEPTH SCALE
1 : 50

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

Golder Associates

PROJECT No.: 1657709 / 5000

RECORD OF MONITORING WELL: K19-MW17-21

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398785.62 E: 503194.64

DRILLING DATE: July 20, 2017
DRILLING CONTRACTOR: Tundra

DATUM: Geodetic

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (⊕) 10 20 30 40	MiniRae 3000 ppm (□) 50 100 150 200	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80	WATER CONTENT % Wp W Wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		Ground Surface		863.77														0.67m Stick-up
0	D120 Truck Mounted Auger Drill / Solid Stem Auger (Casing:152 mm.)	**(ML)** CLAYEY SILT; dark brown; cohesive, w<PL.		0.00						1	03833-07	⊕						
1				862.47														
		Completely weathered (W5), dark brown, moist, SILTSTONE. (Bedrock inferred from drill reaction)	× × ×	1.30														
2			× × ×							2	03833-08	⊕						
			× × ×															7/25/2017
3			× × ×	860.77														
		Highly to moderately weathered (W4-W3), some pieces of siltstone gravel, grey-brown, dry, SILTSTONE. (Bedrock inferred from drill reaction)	× × ×	3.00						3	03833-09	⊕						
			× × ×	860.27														
		Moderately weathered (W3), some pieces of siltstone gravel,grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)	× × ×	3.50														Hydrated Bentonite Chips
4			× × ×															
			× × ×							4	03833-10/03833-11		⊕					PVC Pipe
5			× × ×															
			× × ×															
6		- softer conditions observed from 6 to 6.1m based on drill response. (Similar response to W3 bedrock)	× × ×							5	03833-12		⊕					
			× × ×															
7			× × ×															
			× × ×															
8			× × ×							6	03834-01		⊕					
			× × ×															
9		- harder conditions observed from 8.9 to 9m based on drill response. (Similar response to W3 bedrock)	× × ×															Silica Sand 10/20 #10 Screen
		- softer considitions observed from 9 to 9.5m based on drill response. (Similar response to W3 bedrock)	× × ×							7	03834-02		⊕					
10			× × ×	853.67														
		End of Monitoring Well.		10.10														
11																		
12																		
13																		
14																		
15																		

DEPTH SCALE
1 : 75

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

Golder Associates

PROJECT No.: 1657709 / 5000

RECORD OF MONITORING WELL: K19-MW17-22

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398800.77 E: 503243.32

DRILLING DATE: July 21, 2017
DRILLING CONTRACTOR: Tundra

DATUM: Geodetic

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		Ground Surface		864.24												0.71m Stick-up
0	D120 Truck Mounted Auger Drill / Solid Stem Auger (Casing:152 mm;)	**(ML)** CLAYEY SILT, contains rootlets; brown, no odour; cohesive, w<PL.		0.00						1	03834-03		⊕			
1																
2				862.24						2	03834-04		⊕			
		Highly to completely weathered (W4-W5), some pieces of siltstone gravel, brown, no odour, moist, SILTSTONE. (Bedrock inferred from drill reaction)	× ×	2.00												7/27/2017 ▼
3			× ×	861.04												
		Moderately weathered (W3), some pieces of siltstone gravel, grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction) - harder conditions observed from 3.8 to 3.9m based on drill response. (Similar response to W3 bedrock)	× ×	3.20						3	03834-05		⊕			Hydrated Bentonite Chips
4																PVC Pipe
										4	03834-06/03834-07		⊕			
5																
6																
										5	03834-08		⊕			
7																
8		- harder conditions observed from 7.7 to 7.8m based on drill response. (Similar response to W3 bedrock) - softer conditions observed from 7.8 to 9m based on drill response. (Similar response to W3 bedrock) - slightly moist at ~ 8.2m								6	03834-09			⊕		Silica Sand 10/20 #10 Screen
9		- softer conditions observed at 9.5m based on drill response. (Similar response to W3 bedrock)								7	03834-10		□			Hydrated Bentonite Chips
10				854.24												
		End of Monitoring Well.		10.00												
11																
12																
13																
14																
15																

DEPTH SCALE
1 : 75

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

Golder Associates

National IM Server:GINT_GAL_NATIONALIM Unique Project ID: Output Form:BC_BOREHOLE (GEOENVIRO) RY:James 27/10/17

PROJECT No.: 1657709 / 5000

RECORD OF MONITORING WELL: K19-MW17-23

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398702.42 E: 503136.73

DRILLING DATE: July 21, 2017
DRILLING CONTRACTOR: Tundra

DATUM: Geodetic

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
0		Ground Surface		864.20												0.75m Stick-up
	D120 Truck Mounted Auger Drill / Solid Stem Auger (Casing:152 mm;)	**(ML/GP)** CLAYEY SILT and GRAVEL, contains rootlets; brown, no odour; cohesive, w<PL.		0.00 863.80						1	03834-11		⊕			
		(ML) CLAYEY SILT; brown, no odour; cohesive, w<PL.		0.40 862.90												
1		Completely weathered (W5), brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)		1.30 861.60												
2		Highly to moderately weathered (W3-W4), grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)		2.60 859.60						2	03834-12		⊕			
3		Moderately weathered (W3), grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)		4.60						3	03835-01		⊕			
4		- harder conditions observed from 6.6 to 6.7m based on drill reaction. (Similar response to W3 bedrock)								4	03835-02		⊕			Hydrated Bentonite Chips
5		- harder conditions observed from 7.6 to 7.8m based on drill reaction. (Similar response to W3 bedrock)								5	03835-03		⊕			PVC Pipe 7/27/2017
6		- harder conditions observed from 8.2 to 8.3m based on drill reaction. (Similar response to W3 bedrock)								6	03835-04		⊕			
7		- harder conditions observed from 9.1 to 9.15m based on drill reaction. (Similar response to W3 bedrock)								7	03835-05		⊕			
8		- softer conditions observed from 9.15 to 9.4m based on drill reaction. (Similar response to W3 bedrock)														
9		- softer conditions observed from 11.8 to 12.3m based on drill reaction. (Similar response to W3 bedrock)		851.90						9	03835-06		⊕			Silica Sand 10/20 #10 Screen
10		Slightly weathered (W2), grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)		12.30 851.20												
11		End of Monitoring Well.		13.00												
12																
13																
14																
15																

DEPTH SCALE
1 : 75

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

Golder Associates

National IM Server:GINT_GAL_NATIONALIM Unique Project ID: Output Form:BC_BOREHOLE (GEOENVIRO) RY:James 27/10/17

PROJECT No.: 1657709 / 5000

RECORD OF MONITORING WELL: K19-MW17-24

SHEET 1 OF 1

DATUM: Geodetic

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398679.45 E: 503067.63

DRILLING DATE: July 22, 2017
DRILLING CONTRACTOR: Tundra

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
0		Ground Surface		861.61												
	D120 Truck Mounted Auger Drill / Solid Stem Auger (Casing:152 mm;)	**(ML)** CLAYEY SILT, contains rootlets; brown, no odour; cohesive, w~PL.		0.00						1	03835-08		⊕			0.91m Stick-up
1				860.41												
		Completely weathered (W5), brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)	× × × × × × × ×	1.20 / 860.01												7/26/2017 ▼
2		Highly weathered (W4), grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)	× × × × × × × ×	1.60 / 858.61						2	03835-09		⊕			Hydrated Bentonite Chips; PVC Pipe
3		Highly to moderately weathered (W4-W3), grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)	× × × × × × × ×	3.00						3	03835-10/03835-11		⊕			
4		- moist from from 3.7 to 5.2m														Silica Sand 10/20 #10 Screen
5										4	03835-12		⊕			
		End of Monitoring Well.		5.20 / 856.41												
6																
7																
8																
9																
10																

DEPTH SCALE
1 : 50

Golder Associates

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

PROJECT No.: 1657709 / 5000

RECORD OF MONITORING WELL: K19-MW17-25

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398714.05 E: 502999.21

DRILLING DATE: July 22, 2017
DRILLING CONTRACTOR: Tundra

DATUM: Geodetic

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		Ground Surface		855.43												0.88m Stick-up
0	D120 Truck Mounted Auger Drill / Solid Stem Auger (Casing:152 mm;)	**(ML)** SILT, contains rootlet; brown, no odour; cohesive, w<PL.		0.00						1	03836-01	⊕				
				854.43												
1		Completely weathered (W5), brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)	× ×	1.00												
										2	03836-02	⊕				
				853.63												
2		Highly to completely weathered (W4-W5), brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)		1.80												Hydrated Bentonite Chips
3										3	03836-03	⊕				7/26/2017 ▼
				852.03												
		Highly weathered (W4), grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)		3.40												PVC Pipe
4				851.23												
		Moderately weathered (W3), pieces of siltstone gravel, grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)		4.20												
										4	03836-04	⊕				
5																Silica Sand 10/20 #10 Screen
6		- harder conditions observed from 5.75 to 5.8m based on drill response. (Similar response to W3 bedrock) - softer conditions observed from 5.8 to 6.2m based on drill response. (Similar response to W3 bedrock) - wet at ~ 5.8m								5	03836-05	⊕				
				848.73												
		End of Monitoring Well.		6.70												
7																
8																
9																
10																

DEPTH SCALE
1 : 50

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

Golder Associates

PROJECT No.: 1657709 / 5000

RECORD OF MONITORING WELL: K19-MW17-26

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398747.55 E: 503116.81

DRILLING DATE: July 22, 2017
DRILLING CONTRACTOR: Tundra

DATUM: Geodetic

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
0		Ground Surface		862.11												0.72m Stick-up
	D120 Truck Mounted Auger Drill / Solid Stem Auger (Casing:152 mm.)	**(ML)** CLAYEY SILT, contains rootlets; brown, no odour; cohesive, w<PL.		0.00						1	03836-06		⊕			
				861.31												
1		Completely weathered to residual soil (W5-W6), dark brown, no odour, moist, SILTSTONE.	× ×	0.80												
2			× ×	859.91						2	03836-07		⊕			
		Highly to moderately weathered (W4-W3, brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)	× ×	2.20												
3			× ×	858.81												
		Highly weathered (W4), grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)	× ×	3.40						3	03836-08/03836-09		⊕			
4		Moderately weathered (W3), grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)	× ×													Hydrated Bentonite Chips
5		- harder conditions observed from 4.8 to 4.9m based on drill response. (Similar response to W3 bedrock)	× ×							4	03836-10		⊕			7/30/2017 ▼ PVC Pipe
6			× ×													
7		- harder conditions observed from 6.8 to 6.9m based on drill response. (Similar response to W3 bedrock)	× ×							5	03836-11		⊕			
		- harder conditions observed from 7.5 to 7.8m based on drill response. (Similar response to W3 bedrock)	× ×													
8		- very slight petroleum hydrocarbon-like odour from 8 to 11.8m	× ×							6	03836-12		⊕			
9		- becomes moist at 9m	× ×													
		- softer conditions from 9.3 to 9.8m based on drill response. (Similar response to W3 bedrock)	× ×										⊕			Silica Sand 10/20
10		- harder conditions from 9.8 to 9.9m based on drill response. (Similar response to W3 bedrock)	× ×													#10 Screen
11			× ×							8	03837-01		⊕			
			× ×	850.31												
12		End of Monitoring Well.		11.80												NOTE: Monitoring well was installed in an adjacent borehole approximately 1m from the original borehole location.
13																
14																
15																

DEPTH SCALE
1 : 75

Golder Associates

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

PROJECT No.: 1657709 / 5000

RECORD OF MONITORING WELL: K19-MW17-27

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398785.57 E: 503084.93

DRILLING DATE: July 23, 2017
DRILLING CONTRACTOR: Tundra

DATUM: Geodetic

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		Ground Surface		859.22												0.81m Stick-up
0	D120 Truck Mounted Auger Drill / Solid Stem Auger (Casing:152 mm;)	**(ML)** CLAYEY SILT, contains rootlets; brown, no odour; cohesive, w>PL.		0.00						1	03837-02		⊕			
1				858.12												
		Completely weathered to residual soil (W5-W6), brown, no odour, moist, SILTSTONE	× ×	1.10												
			× ×	857.62												
		Highly weathered (W4), brown, grey, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)	× ×	1.60						2	03837-03		⊕			
2			× ×	856.47												7/27/2017 ▼
		Moderately weathered (W3), grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)	× ×	2.75						3	03837-04		⊕			Hydrated Bentonite Chips
3																
4																PVC Pipe
										4	03837-05		⊕			
5																
6										5	03837-06		⊕			
7		- harder conditions observed from 7.4 to 7.45m based on drill response. (Similar response to W3 bedrock)								6	03837-07		⊕			Silica Sand 10/20 #10 Screen
8		- becomes wet from 8.0 to 8.4m								7	03837-08		⊕			
			× ×	850.47												
		End of Monitoring Well.		8.75												
9																
10																

DEPTH SCALE
1 : 50

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

Golder Associates

National IM Server:GINT_GAL_NATIONALIM Unique Project ID: Output Form:BC_BOREHOLE (GEOENVIRO) RY/James 27/10/17

PROJECT No.: 1657709 / 5000

RECORD OF MONITORING WELL: K19-MW17-28

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398957.79 E: 503136.65

DRILLING DATE: July 23, 2017
DRILLING CONTRACTOR: Tundra

DATUM: Geodetic

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
0		Ground Surface		854.11												0.77m Stick-up
	D120 Truck Mounted Auger Drill / Solid Stem Auger (Casing:152 mm;)	**(ML)** CLAYEY SILT, contains rootlets; brown, no odour; cohesive, w<PL.		0.00						1	03837-09/03837-10		⊕			
1				852.81												
		Highly to completely weathered (W4-W5), pieces of siltstone gravel, grey-brown, moist, SILTSTONE		1.30						2	03837-11		⊕			
2				851.36												
		Slightly weathered (W2), grey-brown, dry, SILTSTONE. (Bedrock inferred from drill reaction)		2.80												Hydrated Bentonite Chips
3		Moderately weathered (W3), grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)								3	03837-12		⊕			
																PVC Pipe
4																7/27/2017 ▼
										4	03838-01		⊕			
5																
6																
		- becomes wet from 6.5 to 7.0m								5	03838-02		⊕			Silica Sand 10/20 #10 Screen
7																
		- harder conditions observed from 7.5 to 7.6m based on drill response. (Similar response for W3 bedrock)														
8										6	03838-03		⊕			Hydrated Bentonite Chips
				845.61												
		End of Monitoring Well.		8.50												
9																
10																

DEPTH SCALE
1 : 50

Golder Associates

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

National IM Server:GINT_GAL_NATIONALIM Unique Project ID: Output Form:BC_BOREHOLE (GEOENVIRO) RY:James 27/10/17

PROJECT No.: 1657709 / 5000

RECORD OF MONITORING WELL: K19-MW17-29D

SHEET 1 OF 2

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6399077.33 E: 503238.95

DRILLING DATE: July 24, 2017
DRILLING CONTRACTOR: Tundra

DATUM: Geodetic

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (⊕) 10 20 30 40 / MiniRae 3000 ppm (□) 50 100 150 200	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80 / WATER CONTENT % Wp W Wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		Ground Surface		854.33												
0	D120 Truck Mounted Auger Drill (Casing:152 mm,) Solid Stem Auger	**(ML/GP)** SILTY CLAY and GRAVEL, some sand; brown, no odour; cohesive, w~PL.		0.00						1	03838-04					-0.29m Cap
1				852.83												Hydrated Bentonite Chips
2		Highly weathered (W5), residual soil, brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)	× × × × × × × × × × × ×	1.50						2	03838-05					PVC Pipe
				851.83												
3		Bedrock Encountered. Refer to Record of MONITORING WELL log for continuation of rock description.		2.50												
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																

DEPTH SCALE
1 : 75

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

Golder Associates

PROJECT No.: 1657709 / 5000

RECORD OF MONITORING WELL: K19-MW17-29D

SHEET 2 OF 2

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6399077.33 E: 503238.95

DRILLING DATE: July 24, 2017
DRILLING CONTRACTOR: Tundra

DATUM: Geodetic

INCLINATION: -90°

DEPTH SCALE METRES	DRILLING RIG	DRILLING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	RUN No.	Refer to "Lithological and Geotechnical Soil and Rock Description Terminology" for accompanying legend and notes. INDICES: ROCK STRENGTH R5 R4 R3 R2 R1; WEATHERING W2 W3 W4; ALTERATION 2 3 4	RECOVERY: TOTAL CORE % 80 60 40 20	RQD % 80 60 40 20	FRACTURE INDEX PER 0.3	DISCONTINUITY DATA: DIP DIRECT. (beta) 90 180 270; DIP w.r.t. CORE AXIS (alpha) 0 30 60 90; TYPE AND SURFACE DESCRIPTION	Fault / Breccia / Gouge; Lost Core; Shear Zone; Broken Core	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
			Cont'd from Record of Monitoring Well.		851.83								
3	D120 Truck Mounted Auger Drill	Solid Stem Auger (Casing:152 mm.)	Highly weathered (W4), dark grey with iron staining, very fine to fine graded, weak, SILTSTONE.		2.50 851.33	1					BC,-,-		
			Highly to completely weathered (W4-W5), dark grey, strong petroleum hydrocarbon-like odours, very fine to fine grained, weak, SILTSTONE.		3.00	2					BC,-,-		Hydrated Bentonite Chips
4											BC,-,-		
					849.47						FR,-,-,Fe		7/27/2017
5			Moderately weathered (W3), dark grey, very fine to fine grained, weak, SILTSTONE. - SANDSTONE from 4.86 to 4.87m		4.86	3		103			BD,-,-,Fe BD,-,-,Fe FR,-,-,Fe		
					848.29						BC,-,-,Fe		PVC Pipe
6			Moderately to slightly weathered (W3-W2), dark grey, very fine to fine grained, weak, SILTSTONE.		6.04	4					FR,-,-,Fe BC,-,-,Fe FR,-,-,Fe FR,-,-,Fe FR,-,-,Fe		
7					846.77								
			Moderately to slightly weathered (W3-W2), dark grey, very fine to fine grained, weak, SILTSTONE.		7.56	5		102			FR,-,- FR,-,- FR,-,- FR,-,- BC,-,-		Silica Sand 10/20 #10 Screen
8											BC,-,-		
					845.25						BC,-,-		
9			Slightly weathered (W2), dark grey, very fine to fine grained, weak to medium strong, SILTSTONE.		9.08	6					FR,-,- FR,-,- FR,-,- FR,-,- FR,-,- FR,-,- FR,-,- BC,-,- FR,-,- FR,-,-		Hydrated Bentonite Pellets
10					843.93						FR,-,-		
			End of MONITORING WELL.		10.40						BC,-,-,Fe FR,-,-		
11													
12													
13													
14													
15													
16													
17													

DEPTH SCALE
1 : 75

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED:

Golder Associates

PROJECT No.: 1657709 / 5000

RECORD OF MONITORING WELL: K19-MW17-29S

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6399077.33 E: 503238.95

DRILLING DATE: July 24, 2017
DRILLING CONTRACTOR: Tundra

DATUM: Geodetic

DEPTH SCALE METRES	DRILLING RIG	DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
			Ground Surface		854.33												
0	D120 Truck Mounted Auger Drill	Solid Stem Auger (Casing:152 mm;)	**(ML/GP)** SILTY CLAY and GRAVEL, some sand; brown, no odour; cohesive, w~PL.		0.00						1	03838-04		⊕			-0.21m Stick-up
1					852.83												
			Highly weathered (W5), brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)		1.50												Hydrated Bentonite Chips
2											2	03838-05		⊕			
			- strong petroleum hydrocarbon-like odour from 2.6 to 5.5m								3	03838-06			□ 415.2		PVC Pipe
3					851.28												
			Moderately weathered (W3), grey-brown, SILTSTONE. (Bedrock inferred from drill reaction)		3.05												
											4	03838-07/03838-08			□ 436.3		7/27/2017 ▼
4																	Silica Sand 10/20 #10 Screen
5			- harder conditions observed from 5.0 to 5.05m based on drill response. (Similar response to W3 bedrock)								5	03838-09		□			
											6	03838-10		⊕			Hydrated Bentonite Chips
					848.83												
			End of Monitoring Well.		5.50												
6																	
7																	
8																	
9																	
10																	

DEPTH SCALE
1 : 50

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

Golder Associates

PROJECT No.: 1657709 / 5000

RECORD OF MONITORING WELL: K19-MW17-30

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398460.43 E: 502961.70

DRILLING DATE: July 25, 2017
DRILLING CONTRACTOR: Tundra

DATUM: Geodetic

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
0		Ground Surface		861.58												0.93m Stick-up
0	D120 Truck Mounted Auger Drill / Solid Stem Auger (Casing:152 mm;)	**(ML)** CLAYEY SILT, contains rootlets; brown, no odour; cohesive, w~PL.		0.00						1	03838-11		⊕			
1																
2				859.58						2	03838-12		⊕			Hydrated Bentonite Chips
2		Highly weathered (W5), brown-grey, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)	× ×	2.00												
3			× ×													
4			× ×							3	03839-01		⊕			7/28/2017 ▼ PVC Pipe
5			× ×	856.58												
5		Moderately weathered (W3), grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction) - softer conditions observed from 5.7 to 6.5m based on drill reaction. (Similar response to W3 bedrock)	× ×	5.00						4	03839-02		⊕			
6			× ×													
7			× ×	855.08												
7		Moderately weathered (W3), grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction) - softer conditions observed from 7.5 to 7.8m based on drill reaction (Similar response to W3 bedrock) - moist to wet at 7.9m	× ×	6.50						5	03839-03		⊕			Silica Sand 10/20 #10 Screen
8			× ×													
8			× ×							6	03839-04		⊕			
9			× ×	852.88												
9		End of Monitoring Well.		8.70												
10																
11																
12																
13																
14																
15																

DEPTH SCALE
1 : 75

Golder Associates

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

PROJECT No.: 1657709 / 5000

RECORD OF MONITORING WELL: K19-MW17-31

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398437.02 E: 502998.18

DRILLING DATE: July 26, 2017
DRILLING CONTRACTOR: Tundra

DATUM: Geodetic

DEPTH SCALE METRES	DRILLING RIG	DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
			Ground Surface		861.71												
0	D120 Truck Mounted Auger Drill	Solid Stem Auger (Casing:152 mm)	**(ML)** SILT, contains rootlets and wood debris; brown, no odour; cohesive, w>PL.		0.00												0.87m Stick-up
					861.41												
			(CL) SILTY CLAY; grey, no odour; cohesive, w~PL.		0.30						1	03839-05		⊕			
1																	7/29/2017 ▼
2											2	03839-06		⊕			
					859.41												Hydrated Bentonite Chips
			(CL) SILTY CLAY, some sand; grey, no odour; cohesive, w>PL.		859.21												
			Highly weathered (W4), grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)		2.50												
3																	PVC Pipe
			- harder conditions observed from 3.5 to 3.8m based on drill response. (Similar response to W4 bedrock)		857.91						3	03839-07		⊕			
			Moderately weathered (W3), grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)		3.80												
4			- moist at 4.0m														
5											4	03839-08		⊕			
			- harder conditions observed from 5.5 to 5.6m based on drill response. (Similar response to W3 bedrock)														Silica Sand 10/20 #10 Screen
6			- wet from 5.8 to 6.0m														
											5	03839-09/03839-10		⊕			Slough
					854.91												
			End of Monitoring Well.		6.80												
7																	
8																	
9																	
10																	

DEPTH SCALE
1 : 50

Golder Associates

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

PROJECT No.: 1657709 / 5000

RECORD OF MONITORING WELL: K19-MW17-32

SHEET 1 OF 1

DATUM: Geodetic

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6399062.69 E: 503380.34

DRILLING DATE: July 26, 2017
DRILLING CONTRACTOR: Tundra

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		Ground Surface		857.27												0.9m Stick-up
0	D120 Truck Mounted Auger Drill / Solid Stem Auger (Casing:152 mm;)	**(ML)** CLAYEY SILT, some gravel; brown, no odour; cohesive, w~PL.		0.00						1	03839-11		⊕			
				856.37												
1		Highly to completely weathered (W4-W5), brown, no odour, cohesive, moist, SILTSTONE.	× × ×	0.90												7/27/2017 ▼ Hydrated Bentonite Chips
2										2	03839-12		⊕			PVC Pipe
				854.57												
3		Highly weathered (W4), grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)		2.70												
				853.77												
4		Moderately weathered (W3), pieces of siltstone gravel, grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction) - wet from 3.5 to 3.7m - softer conditions observed from 4.2 to 5.0m based on drill response. (Similar response to W3 bedrock)		3.50						3	03846-01		⊕			Silica Sand 10/20 #10 Screen
5		- wet from 4.7 to 4.9m - softer conditions observed from 5.0 to 5.05m based on drill response. (Similar response to W3 bedrock)								4	03846-02		⊕			Hydrated Bentonite Chips
				851.67												
		End of Monitoring Well.		5.60												
6																
7																
8																
9																
10																

DEPTH SCALE
1 : 50

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

Golder Associates

PROJECT No.: 1657709 / 5000

RECORD OF MONITORING WELL: K19-MW17-33

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398669.67 E: 502937.41

DRILLING DATE: July 26, 2017
DRILLING CONTRACTOR: Tundra

DATUM: Geodetic

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
0		Ground Surface		851.96												0.79 Stick-up
	D120 Truck Mounted Auger Drill / Solid Stem Auger (Casing:152 mm;)	**(ML)** CLAYEY SILT, some gravel; brown, no odour; cohesive, w<PL.		0.00						1	03846-03	⊕				
1				850.86												
		Highly weathered to compeltely weathered (W4-W5), pieces of siltstone gravel, brown, no odour, dry, SILTSTONE.	× ×	1.10						2	03846-04	⊕				Hydrated Bentonite Chips
2				849.96												
		Highly weathered (W4), grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)		2.00												PVC Pipe
3				848.86												
		Moderately weathered (W3), grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction) - moist at 3.3m		3.10						3	03846-05	⊕				7/28/2017 ▼
4																Silica Sand 10/20 #10 Screen
		- harder conditions observed from 4.4 to 4.5m based on drill response. (Similar response to W3 bedrock) - wet at 4.7m								4	03846-06	⊕				
5				846.36												Hydrated Bentonite Chips
		End of Monitoring Well.		5.60												
6																
7																
8																
9																
10																

DEPTH SCALE
1 : 50

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

Golder Associates

PROJECT No.: 1657709 / 5000

RECORD OF MONITORING WELL: K19-MW17-34

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6398675.76 E: 502976.94

DRILLING DATE: July 27, 2017
DRILLING CONTRACTOR: Tundra

DATUM: Geodetic

DEPTH SCALE METRES	DRILLING RIG	DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
			Ground Surface		855.19												0.88m Stick-up
0	D120 Truck Mounted Auger Drill	Solid Stem Auger (Casing:152 mm;)	**(ML)** CLAYEY SILT, some gravel; brown, no odour; cohesive, w>PL.		0.00						1	03846-07		⊕			
1					854.09												
			Highly to completely weathered (W4-W5), brown, no odour, moist, SILTSTONE.	× ×	1.10												
				× ×	853.69												
			Highly weathered (W4), pieces of siltstone gravel, brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)	× ×	1.50						2	03846-08		⊕			Hydrated Bentonite Chips
2																	
3				× ×	852.09												7/28/2017 ▼
			Moderately weathered (W3), pieces of siltstone gravel, grey-brown, no odour, dry, SILTSTONE. (Bedrock inferred from drill reaction)	× ×	3.10												PVC Pipe
			- moist at 3.6m								3	03846-09/03846-10		⊕			
			- softer conditions observed from 3.8 to 4.2m based on drill response. (Similar response to W3 bedrock)														
4			Slightly weathered (W2), grey-brown, no odour, dry, SILTSTONE.														
5											4	03846-11		⊕			
			- wet from 5.3 to 5.5m														Silica Sand 10/20 #10 Screen
			- softer conditions observed from 5.5 to 5.9m based on drill response. (Similar response to W2 bedrock)														
6			-softer conditions observed from 5.95 to 6.15m based on drill response. (Similar response to W2 berock)														
			- softer conditions observed from 6.15 to 6.5m based on drill response. (Similar response to W2 bedrock)								5	03846-12		⊕			
					848.69												
			End of Monitoring Well.		848.66												
7																	
8																	
9																	
10																	

DEPTH SCALE
1 : 50

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

Golder Associates

PROJECT No.: 1657709 / 5000

RECORD OF MONITORING WELL: K19-MW17-35D

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6399057.81 E: 503217.42

DRILLING DATE: July 27, 2017
DRILLING CONTRACTOR: Tundra

DATUM: Geodetic

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm (10 20 30 40) / MiniRae 3000 ppm (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		Ground Surface		854.62												
0	D120 Truck Mounted Auger Drill / Solid Stem Auger (Casing:152 mm;)	**(ML/GP)** SILTY CLAY and GRAVEL, some sand; brown, no odour; cohesive.		0.00						1	03847-01		⊕			-0.11m Cap
1		- petroleum hydrocarbon-like odour from 0.8 to 1.5m								2	03847-02/03847-03		⊕			
				853.12												
2		Moderately weathered (W3), grey-brown, no odour, non-cohesive, dry, SILTSTONE. (Bedrock inferred from drill reaction)	×	1.50						3	03847-04		⊕			
3			×							4	03847-05		⊕			Hydrated Bentonite Chips
4			×	850.62						5	03847-06		⊕			7/29/2017 ▼ PVC Pipe
		Highly weathered (W4), grey-brown, petroleum hydrocarbon-like odour, non-cohesive, dry, SILTSTONE. (Bedrock inferred from drill reaction)	×	4.00						6	03847-07/03847-08		□			
5			×	849.62												
		Moderately weathered (W3), grey-brown, no odour, non-cohesive, dry, SILTSTONE. (Bedrock inferred from drill reaction)	×	5.00						7	03847-09		□			
6			×													
		- wet at 6.45m	×							8	03847-10		⊕			
7			×													Silica Sand 10/20 #10 Screen
			×							9	03847-11		⊕			
8			×	846.52												Slough
		End of Monitoring Well.		8.10												
9																
10																
11																
12																
13																
14																
15																

DEPTH SCALE
1 : 75

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

Golder Associates

National IM Server:GINT_GAL_NATIONALIM Unique Project ID: Output Form:BC_BOREHOLE (GEOENVIRO) RY:James 27/10/17

PROJECT No.: 1657709 / 5000

RECORD OF MONITORING WELL: K19-MW17-35S

SHEET 1 OF 1

CLIENT: Public Services and Procurement Canada
PROJECT: Alaska Highway
LOCATION: K19
N: 6399058.58 E: 503218.21

DRILLING DATE: July 27, 2017
DRILLING CONTRACTOR: Tundra

DATUM: Geodetic

DEPTH SCALE METRES	DRILLING RIG / DRILLING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	GEOTECH SAMPLES: NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	CHEMISTRY SAMPLES: NUMBER	SCN	ANALYSED	MiniRae 3000 ppm ⊕ (10 20 30 40) / MiniRae 3000 ppm □ (50 100 150 200)	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / WATER CONTENT % Wp W Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		Ground Surface		854.56												
0	D120 Truck Mounted Auger Drill / Solid Stem Auger (Casing:152 mm;)	**(ML/GP)** SILTY CLAY and GRAVEL, some sand; brown, no odour; cohesive.		0.00												-0.11m Cap
1		- petroleum hydrocarbon-like odour from 0.8 to 1.5m		853.06												
2		Moderately weathered (W3), grey-brown, no odour, non-cohesive, dry, SILTSTONE. (Bedrock inferred from drill reaction)	× ×	1.50												Hydrated Bentonite Chips
3			× ×													PVC Pipe
4			× ×	850.56												7/29/2017 ▼
		Highly weathered (W4), grey-brown, petroleum hydrocarbon-like odour, non-cohesive, dry, SILTSTONE. (Bedrock inferred from drill reaction)	× ×	4.00												Silica Sand 10/20 #10 Screen
5			× ×	849.56												
		End of Monitoring Well.		5.00												
6																
7																
8																
9																
10																

DEPTH SCALE
1 : 50

Golder Associates

SOIL CLASSIFICATION SYSTEM: GACS
LOGGED: KDB
CHECKED: EOB

Grade	Description	Field Identification	Approximate Range of Uniaxial Compressive Strength (Mpa)
R0	Extremely weak rock	Indented by thumbnail	0.25 - 1.0
R1	Very weak rock	Material crumbles under firm blows of geological pick, can be shaped with knife	1.0 - 5.0
R2	Weak rock	Knife cuts material but too hard to shape into triaxial shape	5.0 - 25
R3	Medium strong rock	Firm blow with geological pick indents rock to 5 mm, knife just scrapes surface	25 - 50
R4	Strong rock	Hand held specimens broken by a single blow of geological hammer	50 - 100
R5	Very strong rock	Requires many blows of a geological hammer to break intact rock specimens	100 - 250
R6	Extremely strong rock	Rock material only chipped under repeated hammer blows, rings when struck	>250

Note: Materials having a uniaxial compressive strength (UCS) of less than about 0.5 MPa and cohesionless materials should be classified using soil classification systems. 1 MPa = 145 psi

Figure 1: Field identification methods for the description of rock strength (ISRM 1981)[1].

[1] ISRM (1981). Rock Characterization Testing and Monitoring – ISRM Suggested Methods, Pergamon Press, London, England, Brown, E.T.

Symbol	Term	Description	Discolouration Extent	Fracture Condition	Surface Characteristics
W1	Fresh	No visible sign of rock material weathering	None	Closed or Discoloured	Unchanged
W2	Slightly Weathered	Discolouration indicates weathering of rock material on discontinuity surfaces. Less than 5% of rock mass altered	Less than 20% of fracture spacing on both sides of fracture	Discoloured, may contain thin filling	Partial discoloration
W3	Moderately Weathered	Less than 50% of the rock material is decomposed and/or disintegrated to a soil. Fresh or discoloured rock is present either as a discontinuous framework or as core stones	Greater than 20% of fracture spacing on both sides of fracture	Discoloured, may contain thick filling	Partial to complete discolouration, not friable except poorly cemented rocks
W4	Highly Weathered	More than 50% of the rock material is decomposed and/or disintegrated to a soil. Fresh or discoloured rock is present either as a discontinuous framework or as core stones	Throughout	Filled with alteration minerals	Friable and possibly pitted
W5	Completely Weathered	100% of rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact	Throughout	Filled with alteration minerals	Resembles soil
W6	Residual Soil	All rock material is converted to soil. The mass structure and material fabric are destroyed. There is a large change in volume, but the soil has not been significantly transported	Throughout	N/A	Resembles soil

Figure 2: Field identification methods for weathering classification (ISRM 1981).

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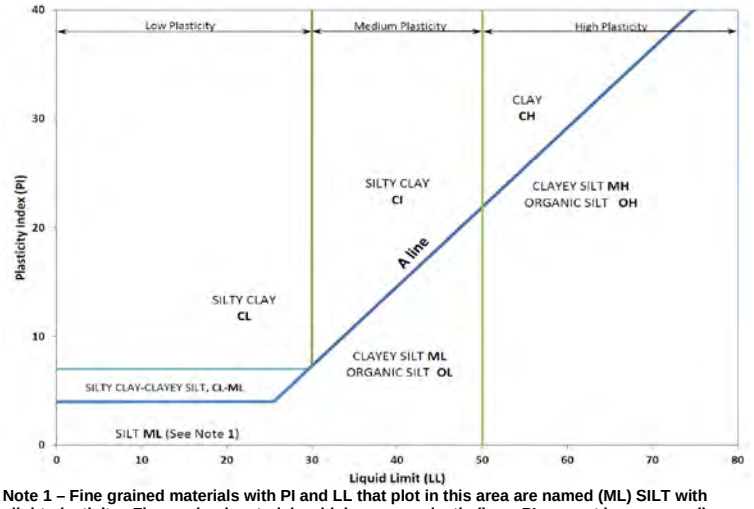
METHOD OF SOIL CLASSIFICATION

The Golder Associates Ltd. Soil Classification System is based on the Unified Soil Classification System (USCS)

Organic or Inorganic	Soil Group	Type of Soil		Gradation or Plasticity	$Cu = \frac{D_{60}}{D_{10}}$	$Cc = \frac{(D_{30})^2}{D_{10} x D_{60}}$	Organic Content	USCS Group Symbol	Group Name
INORGANIC (Organic Content ≤30% by mass)	COARSE-GRAINED SOILS (>50% by mass is larger than 0.075 mm)	GRAVELS (>50% by mass of coarse fraction is larger than 4.75 mm)	Gravels with ≤12% fines (by mass)	Poorly Graded	<4	≤1 or ≥3	≤30%	GP	GRAVEL
				Well Graded	≥4	1 to 3		GW	GRAVEL
			Gravels with >12% fines (by mass)	Below A Line	n/a			GM	SILTY GRAVEL
				Above A Line	n/a			GC	CLAYEY GRAVEL
		SANDS (≥50% by mass of coarse fraction is smaller than 4.75 mm)	Sands with ≤12% fines (by mass)	Poorly Graded	<6	≤1 or ≥3		SP	SAND
				Well Graded	≥6	1 to 3		SW	SAND
			Sands with >12% fines (by mass)	Below A Line	n/a			SM	SILTY SAND
				Above A Line	n/a			SC	CLAYEY SAND

Organic or Inorganic	Soil Group	Type of Soil		Laboratory Tests	Field Indicators					Organic Content	USCS Group Symbol	Primary Name
					Dilatancy	Dry Strength	Shine Test	Thread Diameter	Toughness (of 3 mm thread)			
INORGANIC (Organic Content ≤30% by mass)	FINE-GRAINED SOILS (≥50% by mass is smaller than 0.075 mm)	SILTS (Non-Plastic or PI and LL plot below A-Line on Plasticity Chart below)		Liquid Limit <50	Rapid	None	None	>6 mm	N/A (can't roll 3 mm thread)	<5%	ML	SILT
					Slow	None to Low	Dull	3mm to 6 mm	None to low	<5%	ML	CLAYEY SILT
					Slow to very slow	Low to medium	Dull to slight	3mm to 6 mm	Low	5% to 30%	OL	ORGANIC SILT
				Liquid Limit ≥50	Slow to very slow	Low to medium	Slight	3mm to 6 mm	Low to medium	<5%	MH	CLAYEY SILT
					None	Medium to high	Dull to slight	1 mm to 3 mm	Medium to high	5% to 30%	OH	ORGANIC SILT
		CLAYS (PI and LL plot above A-Line on Plasticity Chart below)		Liquid Limit <30	None	Low to medium	Slight to shiny	~ 3 mm	Low to medium	0% to 30% (see Note 2)	CL	SILTY CLAY
				Liquid Limit 30 to 50	None	Medium to high	Slight to shiny	1 mm to 3 mm	Medium		CI	SILTY CLAY
				Liquid Limit ≥50	None	High	Shiny	<1 mm	High		CH	CLAY
HIGHLY ORGANIC SOILS (Organic Content >30% by mass)		Peat and mineral soil mixtures								30% to 75%	PT	SILTY PEAT, SANDY PEAT
		Predominantly peat, may contain some mineral soil, fibrous or amorphous peat								75% to 100%		PEAT



Note 1 – Fine grained materials with PI and LL that plot in this area are named (ML) SILT with slight plasticity. Fine-grained materials which are non-plastic (i.e. a PL cannot be measured) are named SILT.
Note 2 – For soils with <5% organic content, include the descriptor "trace organics" for soils with between 5% and 30% organic content include the prefix "organic" before the Primary name.

Dual Symbol — A dual symbol is two symbols separated by a hyphen, for example, GP-GM, SW-SC and CL-ML.
For non-cohesive soils, the dual symbols must be used when the soil has between 5% and 12% fines (i.e. to identify transitional material between "clean" and "dirty" sand or gravel.
For cohesive soils, the dual symbol must be used when the liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart (see Plasticity Chart at left).

Borderline Symbol — A borderline symbol is two symbols separated by a slash, for example, CL/CI, GM/SM, CL/ML.
A borderline symbol should be used to indicate that the soil has been identified as having properties that are on the transition between similar materials. In addition, a borderline symbol may be used to ~~or~~ indicate~~s~~ a range of similar soil types within a stratum.

ABBREVIATIONS AND TERMS USED ON RECORDS OF BOREHOLES AND TEST PITS

PARTICLE SIZES OF CONSTITUENTS

Soil Constituent	Particle Size Description	Millimetres	Inches (US Std. Sieve Size)
BOULDERS	Not Applicable	>300	>12
COBBLES	Not Applicable	75 to 300	3 to 12
GRAVEL	Coarse Fine	19 to 75 4.75 to 19	0.75 to 3 (4) to 0.75
SAND	Coarse Medium Fine	2.00 to 4.75 0.425 to 2.00 0.075 to 0.425	(10) to (4) (40) to (10) (200) to (40)
SILT/CLAY	Classified by plasticity	<0.075	< (200)

MODIFIERS FOR SECONDARY AND MINOR CONSTITUENTS

Percentage by Mass	Modifier
>35	Use 'and' to combine major constituents (*i.e.,* SAND and GRAVEL, SAND and CLAY)
> 12 to 35	Primary soil name prefixed with "gravelly, sandy, SILTY, CLAYEY" as applicable
> 5 to 12	some
≤ 5	trace

PENETRATION RESISTANCE

Standard Penetration Resistance (SPT), N:

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) split-spoon sampler for a distance of 300 mm (12 in.).

Cone Penetration Test (CPT)

An electronic cone penetrometer with a 60° conical tip and a project end area of 10 cm^2 pushed through ground at a penetration rate of 2 cm/s. Measurements of tip resistance (q_t), porewater pressure (u) and sleeve frictions are recorded electronically at 25 mm penetration intervals.

Dynamic Cone Penetration Resistance (DCPT); N_d:

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) to drive uncased a 50 mm (2 in.) diameter, 60° cone attached to "A" size drill rods for a distance of 300 mm (12 in.).

PH: Sampler advanced by hydraulic pressure
PM: Sampler advanced by manual pressure
WH: Sampler advanced by static weight of hammer
WR: Sampler advanced by weight of sampler and rod

SAMPLES

AS	Auger sample
BS	Block sample
CS	Chunk sample
DO or DP	Seamless open ended, driven or pushed tube sampler – note size
DS	Denison type sample
FS	Foil sample
GS	Grab Sample
RC	Rock core
SC	Soil core
SS	Split spoon sampler – note size
ST	Slotted tube
TO	Thin-walled, open – note size
TP	Thin-walled, piston – note size
WS	Wash sample

SOIL TESTS

w	water content
PL , w_p	plastic limit
LL , w_L	liquid limit
C	consolidation (oedometer) test
CHEM	chemical analysis (refer to text)
CID	consolidated isotropically drained triaxial test[1]
CIU	consolidated isotropically undrained triaxial test with porewater pressure measurement[1]
D_R	relative density (specific gravity, Gs)
DS	direct shear test
GS	specific gravity
M	sieve analysis for particle size
MH	combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	organic content test
SO_4	concentration of water-soluble sulphates
UC	unconfined compression test
UU	unconsolidated undrained triaxial test
V (FV)	field vane (LV-laboratory vane test)
γ	unit weight

1. Tests which are anisotropically consolidated prior to shear are shown as CAD, CAU.

NON-COHESIVE (COHESIONLESS) SOILS

Compactness[2]

Term	SPT 'N' (blows/0.3m)[1]
Very Loose	0 - 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very Dense	>50

1. SPT 'N' in accordance with ASTM D1586, uncorrected for overburden pressure effects.
2. Definition of compactness descriptions based on SPT 'N' ranges from Terzaghi and Peck (1967) and correspond to typical average N_{60} values.

Field Moisture Condition

Term	Description
Dry	Soil flows freely through fingers.
Moist	Soils are darker than in the dry condition and may feel cool.
Wet	As moist, but with free water forming on hands when handled.

COHESIVE SOILS

Consistency

Term	Undrained Shear Strength (kPa)	SPT 'N'[1] (blows/0.3m)
Very Soft	<12	0 to 2
Soft	12 to 25	2 to 4
Firm	25 to 50	4 to 8
Stiff	50 to 100	8 to 15
Very Stiff	100 to 200	15 to 30
Hard	>200	>30

1. SPT 'N' in accordance with ASTM D1586, uncorrected for overburden pressure effects; approximate only.

Water Content

Term	Description
w < PL	Material is estimated to be drier than the Plastic Limit.
w ~ PL	Material is estimated to be close to the Plastic Limit.
w > PL	Material is estimated to be wetter than the Plastic Limit.

LIST OF SYMBOLS

Unless otherwise stated, the symbols employed in the report are as follows:

I. GENERAL

π	3.1416
ln x	natural logarithm of x
$\log_{10}$	x or log x, logarithm of x to base 10
g	acceleration due to gravity
t	time

II. STRESS AND STRAIN

γ	shear strain
Δ	change in, e.g. in stress: $\Delta\sigma$
ε	linear strain
ε_v	volumetric strain
η	coefficient of viscosity
υ	Poisson's ratio
σ	total stress
σ'	effective stress ($\sigma' = \sigma - u$)
σ'_{vo}	initial effective overburden stress
σ_1, σ_2, σ_3	principal stress (major, intermediate, minor)
σ_{oct}	mean stress or octahedral stress $= (\sigma_1 + \sigma_2 + \sigma_3)/3$
τ	shear stress
u	porewater pressure
E	modulus of deformation
G	shear modulus of deformation
K	bulk modulus of compressibility

III. SOIL PROPERTIES

(a) Index Properties

$\rho(\gamma)$	bulk density (bulk unit weight)*
$\rho_d(\gamma_d)$	dry density (dry unit weight)
$\rho_w(\gamma_w)$	density (unit weight) of water
$\rho_s(\gamma_s)$	density (unit weight) of solid particles
γ'	unit weight of submerged soil ($\gamma' = \gamma - \gamma_w$)
D_R	relative density (specific gravity) of solid particles ($D_R = \rho_s / \rho_w$) (formerly G_s)
e	void ratio
n	porosity
S	degree of saturation

* Density symbol is ρ. Unit weight symbol is γ where $\gamma = \rho g$ (i.e. mass density multiplied by acceleration due to gravity)

(a) Index Properties (continued)

w	water content
w_l or LL	liquid limit
w_p or PL	plastic limit
I_p or PI	plasticity index = $(w_l - w_p)$
w_s	shrinkage limit
I_L	liquidity index = $(w - w_p) / I_p$
I_C	consistency index = $(w_l - w) / I_p$
e_{max}	void ratio in loosest state
e_{min}	void ratio in densest state
I_D	density index = $(e_{max} - e) / (e_{max} - e_{min})$ (formerly relative density)

(b) Hydraulic Properties

h	hydraulic head or potential
q	rate of flow
v	velocity of flow
i	hydraulic gradient
k	hydraulic conductivity (coefficient of permeability)
j	seepage force per unit volume

(c) Consolidation (one-dimensional)

C_c	compression index (normally consolidated range)
C_r	recompression index (over-consolidated range)
C_s	swelling index
C_α	secondary compression index
m_v	coefficient of volume change
c_v	coefficient of consolidation (vertical direction)
c_h	coefficient of consolidation (horizontal direction)
T_v	time factor (vertical direction)
U	degree of consolidation
σ'_p	pre-consolidation stress
OCR	over-consolidation ratio = σ'_p / σ'_{vo}

(d) Shear Strength

τ_p, τ_r	peak and residual shear strength
ϕ'	effective angle of internal friction
δ	angle of interface friction
μ	coefficient of friction = tan δ
c′	effective cohesion
c_u, s_u	undrained shear strength ($\phi = 0$ analysis)
p	mean total stress $(\sigma_1 + \sigma_3)/2$
p′	mean effective stress $(\sigma'_1 + \sigma'_3)/2$
q	$(\sigma_1 - \sigma_3)/2$ or $(\sigma'_1 - \sigma'_3)/2$
q_u	compressive strength $(\sigma_1 - \sigma_3)$
S_t	sensitivity

Notes: 1 $\tau = c' + \sigma' \tan \phi'$

2 shear strength = (compressive strength)/2

APPENDIX E

Monitoring Well Field Forms

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☒ Development
☐ Purging/Sampling
Well No.: K19-MW17-10

Project Name: K-19 Tretch-AK Hwy
Location: Tretch BC
Weather: Windy, Overcast **Temperature:** ~15°C
GPS Coordinates:
Project No.: 1657709-5000
Date: 2017 – 19 – July
Completed By: D. Klammer
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 14:25
Depth to Product: – m
Product Thickness: 0 m
Depth to Water (A): 5.937 m below ☐ TOP
Depth to Bottom of Well (B): 9.527 m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good
Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: – ppm
One Well Volume:
(B-A)*2.0 = 7.18L Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☒ Waterra
☐ Hydrolift
☐ Bailer (Type:________)
☐ Peristaltic
☐ Submersible
☐ Bladder

Multimeter Model: YSI Pro Plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redox) Meter Model:
Organic Vapour Meter Model: –

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ____ ☐ pH7 ____
☐ pH10 ____
☐ 1413 us/cm ____

Pump Details: Waterra footvalve ☐ D.O. Ampoule
☒ Field Calibration DO, pH 7, 4, 10, Cond.

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 7.10 = ____ litres
Start: 16:35 Finish:
Avg. Flow Rate: ____ L/min.
Sample intake depth: NA → purging w/ waterra

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
16:38	4	8.2	6.08	3255	-6.1	7.26	7.715	silty, brown, slight HC-like odour; NS
*footvalve off at 7L								
17:04	13.5L → purged fully w/ waterra; DTW = 9.153m							
* to return; note, footvalve in well								

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☐ No If yes
Sheen: ☐ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. ____
Field Dup. ____
Consumables: ☐ Waterra Tubing ____ ☐ Silicon Tubing ____ ☐ HDPE/Teflon Tubing ____ ☐ D.O. Ampoules ____ ☐ Groundwater Filter ☐ Footvalve

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GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☑ Development
☐ Purging/Sampling
Well No.: K19 MW17-17

Project Name: K-19 Trtch-AK Hwy
Project No.: 1657709-5000
Location: Tritch Bc
Date: 2017-20-17
Weather: ______ **Temperature:** ______
Completed By: AW/MZ
GPS Coordinates: ______
Reviewed By: ______

MONITORING WELL INFORMATION

Purge 4

Time of Measurement: ______
Depth to Product: ______ m
Product Thickness: ______ m
Depth to Water (A): (5.581) 7.727 m below ☐ TOP
Depth to Bottom of Well (B): 8.771 m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition: ______
Tidally Influenced: ☐ Yes ☐ No
Pressurized: ☐ Yes ☐ No
Well Headspace: ______ ppm
One Well Volume:
(B-A)*2.0 = 6.4 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ______ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra
☐ Hydrolift
☐ Bailer (Type: ______)
☐ Peristaltic
☐ Submersible
☐ Bladder

Multimeter Model: YSI V10 PLUS
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ______ ☐ pH7 ______
☐ pH10 ______
☐ 1413 us/cm ______
☑ Field Calibration OK

Pump Details: hand

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 6 = 38.4 litres
Start: ______ Finish: 25 JUL 12:10
Avg. Flow Rate: ______ L/min.
Sample intake depth: ______

Date	Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☐ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
July 9/17		4							
July 20/17		4	7.7	7.31	605.9	2.9	13.92	5.581	AW Clear
July 20/16	1:25	10	7.3	7.54	604.3	10.2	13.93	7.76	Muddy
July 20/17	1:30	12	9.2	7.57	613	21.3	12.74	8.78	DRY!
July 24/17	10:20	28	10.3	—	639.2	~~[illegible]~~ -	7.64	5.214	very silty; dry
Jul 24/17	1440	33	10.5	7.31	638.9	- ~~[illegible]~~	11.33	7.582	very silty → dry
Jul 25	0910	43	7.8	7.62	615.0	—	13.51	5.344	clearing → dry
Jul 25	1210	47	9.1	6.98	586.0	123.4	10.79	7.535	clearing → dry

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes ______
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear IIIIIIIIIIIIIIIIIIIIIIIIIIIII Very Silty
F S

Analysis	Type		40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
			Container Size									
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. ______
Field Dup. ______
Consumables: ☑ Waterra Tubing 10 m ☐ HDPE/Teflon Tubing ______ ☐ Groundwater Filter
☐ Silicon Tubing ______ ☐ D.O. Ampoules ______ ☑ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☑ Development
☐ Purging/Sampling
Well No.: K19-MW17-18

Project Name: K-19 Tetch-AK Hwy
Location: Teten Bc
Weather: Bluesky **Temperature:**
GPS Coordinates:
Project No.: 1657709-5000
Date: 2017-20-07
Completed By: AW/MZ
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 12:20
Depth to Product: — m Product Thickness: — m
Depth to Water (A): 6.336 m below ☑ TOP
Depth to Bottom of Well (B): 7.381 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: Brand New!
Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 2.0 Litres - for a 51 mm (2.0 inch) diameter well
~~(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well~~

EQUIPMENT LIST

Pump ☐ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☐ Peristaltic
☐ Submersible
☐ Bladder
Pump Details: Hand-pump.

Multimeter Model: YSI ProPlus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ☐ pH7
☐ pH10
☐ 1413 us/cm
☑ Field Calibration ok

WELL DEVELOPMENT/PURGING

LL

Purge Volume: Well. Vol. X 6 = 12 litres →make purge 8L, Konanc 10L.
Avg. Flow Rate: L/min.
Start: Finish:
Sample intake depth:

Date	Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
July 20/17	12:20	20	11.0	6.46	2019	73.3	14.2	6.221	AW
		24	9.8	7.25	646	7.34	13.29	7.380	DRY

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☐ No If yes
Sheen: ☐ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No.
Field Dup.
Consumables: ☐ Waterra Tubing ☐ HDPE/Teflon Tubing ☐ Groundwater Filter
☐ Silicon Tubing ☐ D.O. Ampoules ☐ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☒ Development
☐ Purging/Sampling

Well No.: ~~K19-MW17-19~~ (MW20) K19-MW17-19

Project Name: K-19 Tritch-AK Hwy
Location: Tritch BC
Weather: Overcast **Temperature:** ~15°C
GPS Coordinates:
Project No.: 1657709-5000
Date: 2017-20-2017
Completed By: D. Klamner
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 12:42
Depth to Product: – m
Product Thickness: ______ m
Depth to Water (A): 3.780 m below ☐ TOP
Depth to Bottom of Well (B): 8.830 m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good
Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☒ Yes ☐ No → Highly
Well Headspace: – ppm
One Well Volume:
(B-A)*2.0 = 10.1 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ______ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☒ Waterra
☐ Hydrolift
☐ Bailer (Type: ____________)
☐ Peristaltic
☐ Submersible
☐ Bladder
Pump Details: Check-valve

Multimeter Model: YSI Pro Plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model: –
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ______ ☐ pH7 ______
☐ pH10 ______
☐ 1413 us/cm ______
☒ Field Calibration DO, pH 7 4 10, Cond

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 6 = 60.6 litres
Start: 12:50 Finish:
Avg. Flow Rate: ______ L/min.
Sample intake depth:

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
12:53	6	5.4	7.19	614.6	-66.1	10.36	5.640	silty NO, NS
13:05	26.1	5.5	7.26	602.4	-13.7	10.26	8.021	" " "
13:26	60	4.7	7.39	553.7	-16.6	11.76	8.039	" " "
13:39	65	4.0	7.24	565.7	-16.1	9.88	8.065	" " "
* [illegible] well needs [illegible] + well [illegible]								

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☐ No If yes
Sheen: ☐ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. ____________
Field Dup. ____________
Consumables: ☐ Waterra Tubing ______ ☐ HDPE/Teflon Tubing ______ ☐ Groundwater Filter
☐ Silicon Tubing ______ ☐ D.O. Ampoules ______ ☐ Footvalve

*30L was purged after install prior to starting development

(MLHI)

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☒ Development
☐ Purging/Sampling
Well No.: K19-MW17-20

Project Name: K-19 Trtch-AK Hwy
Location: Trtch BC
Weather: Sunny
Temperature: ~15°C
GPS Coordinates:
Project No.: 1657709-5000
Date: 2017 - 21 - 17
Completed By: D. Klammer
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 10:05
Depth to Product: – m
Product Thickness: ____ m
Depth to Water (A): 2.084 m below ☒ TOP
Depth to Bottom of Well (B): 6.052 m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good
Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: – ppm
One Well Volume:
(B-A)*2.0 = 7.936 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☑ Waterra
☐ Hydrolift
☐ Bailer (Type: ____)
☐ Peristaltic
☐ Submersible
☐ Bladder

Pump Details: Footvalve

Multimeter Model: YSI Pro Plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model: –
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ____ ☐ pH7 ____
☐ pH10 ____
☐ 1413 us/cm ____
☑ Field Calibration DO(%), 7, 4, 10, Cond

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 6 = 47.62 litres
Start: 10:10
Finish:
Avg. Flow Rate: ____ L/min.
Sample intake depth:

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
10:13	4.0	8.4	6.93	598.1	25.1	8.32	3.993	Very silty, NO, NS
10:29	17.0	9.4	7.11	575.9	26.4	9.06	6.010	" " "
* [illegible] return this afternoon							~~2.049~~	
12:00	→ continue developing						2.049	
15:03	31.0	9.8	7.35	588.1	12.5	9.6	5.751	" " "
*drying out, continue purging another day								

#10:05 - wat... broke - re...

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes ____
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. ____
Field Dup. ____
Consumables: ☐ Waterra Tubing ____ ☐ HDPE/Teflon Tubing ____ ☐ Groundwater Filter
☐ Silicon Tubing ____ ☐ D.O. Ampoules ____ ☐ Footvalve

Propose ID (mw-9) K19-MW17-21

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☒ Development
☐ Purging/Sampling

Well No. [redacted]

Project Name:	K-19 Tritch-AK Hwy	**Project No.:**	1657709-5000
Location:	Tritch BC	**Date:**	2017 - 21 - 17
Weather:	Sunny **Temperature:**	**Completed By:**	AW
GPS Coordinates:		**Reviewed By:**	

MONITORING WELL INFORMATION

Time of Measurement: 15:30
Depth to Product: — m
Product Thickness: ____ m
Depth to Water (A): 3.834 m below ☐ TOP
Depth to Bottom of Well (B): 10.884 m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition: New

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 14 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☒ Waterra
☐ Hydrolift
☐ Bailer (Type: ____)
☐ Peristaltic
☐ Submersible
☐ Bladder

Pump Details: hand pump

Multimeter Model: YSI ProPlus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ____ ☐ pH7 ____
☐ pH10 ____
☐ 1413 us/cm ____
☒ Field Calibration OK

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X ~6 = 84 litres
Avg. Flow Rate: ____ L/min.
Start: 15:40 Finish: 17:20
Sample intake depth: ____

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. (µS/cm) or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
16:00	24L	10.3	7.66	400.6	12.9	13.85	9.15	SILTY
16:20	42	13.6	7.26	307.21	-357	11.37	10.05	SILTY
16:40	56	10.2	7.29	270.34	-0.8	13.56	8.20	SILTY
17:00	74	8.1	7.35	402.1	-18.5	1827	9.584	*still somewhat silty
17:10	84L	purged!						

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☐ No If yes ____
Sheen: ☐ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

(Container Size)

SCN No. ____
Field Dup. ____
Consumables: ☒ Waterra Tubing ____ ☐ HDPE/Teflon Tubing ____ ☐ Groundwater Filter
☐ Silicon Tubing ____ ☐ D.O. Ampoules ____ ☐ Footvalve

Note: Used 12 m of Tubing from drillers

(MW-10)

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☒ Development
☐ Purging/Sampling

Well No.: K19-MW17-22
K19-MW17-22

Project Name: K-19 Trtch-AK Hwy
Location: Trtch BC
Weather: Rain **Temperature:** ~10°C
GPS Coordinates:

Project No.: 1657709-5000
Date: 2017-23-July
Completed By: DK / MZ
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 15:00
Depth to Product: — m
Product Thickness: — m
Depth to Water (A): 3.397 m below ☒ TOP
Depth to Bottom of Well (B): 9.839 m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 12.884 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☒ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☐ Peristaltic
☐ Submersible
☐ Bladder

Pump Details: footvalve

Multimeter Model: YSI Pro Plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redox) Meter Model:
Organic Vapour Meter Model: —
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ☐ pH7
☐ pH10
☐ 1413 us/cm
☒ Field Calibration DO, [illegible], Cond.

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 7.13 = ____ litres
Avg. Flow Rate: ____ L/min.
Start: 15:10
Finish: 26-JUL 09:40
Sample intake depth:

Date	Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
	15:12	8	6.2	7.18	557.5	16.9	5.23	6.624	→ slightly silty
	15:25	19	8.2	7.16	602.5	24.6	8.51	9.623	clear, [illegible]
24-JUL	1055	31	9.6	—	578.1	—	10.86	5.332	dry after 19L; [illegible] clearing ; dry after 12L
24-JUL	1515	38	8.1	7.06	557.5	—	10.87	7.552	clearing → dry after 7L
25-JUL	0920	54	8.7	6.91	531.5	—	9.98	3.632	clear → dry after 16L
25-JUL	1230	60	7.3	6.92	523.0	—	10.96	7.991	clear → dry after 6L
25-JUL	1635	68	9.0	6.66	530.0	27.5	7.15	7.170	clear → dry after 8L
26-JUL	0940	84	8.2	6.95	523.2	—	7.24	3.657	clear → dry after 16L

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII Very Silty
F S

Analysis	Type		40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

(Container Size spans 40 mL to 4 L)

SCN No. ____
Field Dup. ____
Consumables: ☐ Waterra Tubing ____ ☐ HDPE/Teflon Tubing ____ ☐ Groundwater Filter
☐ Silicon Tubing ____ ☐ D.O. Ampoules ____ ☐ Footvalve

* moderate recharge
*Top of pipe ~0.730 m above ground surface

(MW-6)

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☑ Development ☐ Purging/Sampling Well No.: K19-MW17-23

Project Name: K-19 Tritch-AK Hwy **Project No.:** 1657709-5000
Location: Tritch BC **Date:** 2017-23-July
Weather: Rainy **Temperature:** ~10°C **Completed By:** D.K. / MZ
GPS Coordinates: **Reviewed By:**

MONITORING WELL INFORMATION

Time of Measurement: 11:40
Depth to Product: - m Product Thickness: ____ m
Depth to Water (A): 8.499 m below ☐ TOP
Depth to Bottom of Well (B): 13.744 m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition: silty, good

Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: - ppm
One Well Volume:
(B-A)*2.0 = 10.6 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☑ Waterra ☐ Hydrolift ☐ Bailer (Type:____) ☐ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: Footvalve

Multimeter Model: YSI ProPlus ☐ Rental Equipment:
pH/Temp Meter Model:
Conductivity Meter Model: ☐ Field Bump
Dissolved Oxygen Meter Model: ☐ pH4 ____ ☐ pH7 ____
ORP (Redex) Meter Model: ☐ pH10 ____
Organic Vapour Meter Model: ☐ 1413 us/cm ____
☐ D.O. Ampoule ☑ Field Calibration DO, 7, 4/10, cond

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 6 = 63.6 litres Start: 11:54 Finish: 25-JUL 16:45
Avg. Flow Rate: ____ L/min. Sample intake depth: ____

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
11:52	4	6.1	8.11	930	-6.5	12.01	9.575	silty, NO, NS
12:10	18	stopping out - return this afternoon					8.880	silty, refusal
14:05	limited recharge	NO past 2 hours; pump dry again					12.363	
14:31	22						13.305	
24-JUL 11:30	36	9.8	-	627.4	-	11.26	9.797	very silty, dry
24-JUL 15:25	42	10.4	8.06	822.0	-	9.67	11.618	very silty → 0 dry
25-JUL 09:45	54	8.0	8.03	823	-225.4	10.01	9.980	very silty → dry
25-JUL 13:45	59	11.2	7.97	775	33.4	8.19	11.494	silty 0 → dry
25-JUL 16:45	64	9.5	7.71	808	-67.0	8.95	11.786	silty 0 → dry 0

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes ____
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear IIIIIIIIIIIIIIIIIIIIIIIIIIIIII Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. ____ Consumables: ☐ Waterra Tubing ____ ☐ HDPE/Teflon Tubing ____ ☐ Groundwater Filter
Field Dup. ____ ☐ Silicon Tubing ____ ☐ D.O. Ampoules ____ ☐ Footvalve

Golder Associates

(MW-5)

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☒ Development
☐ Purging/Sampling
Well No.: K19-MW17-24

Project Name: K-19 Trutch-AK Hwy
Location: Trutch BC
Weather: Rain
Temperature: ~10°C
GPS Coordinates:
Project No.: 1657709-5000
Date: 2017-23-July
Completed By: DK
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 12:30
Depth to Product: - m
Product Thickness: ____ m
Depth to Water (A): 2.276 m below ☐ TOP
Depth to Bottom of Well (B): 5.912 m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good
Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: - ppm
One Well Volume:
(B-A)*2.0 = 7.272 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☒ Waterra
☐ Hydrolift
☐ Bailer (Type: ____)
☐ Peristaltic
☐ Submersible
☐ Bladder
Pump Details: Footvalve

Multimeter Model: YSI ProPlus
pH/Temp Meter Model: |
Conductivity Meter Model: |
Dissolved Oxygen Meter Model: |
ORP (Redex) Meter Model: ↓
Organic Vapour Meter Model: -
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ____ ☐ pH7 ____
☐ pH10 ____
☐ 1413 us/cm ____
☒ Field Calibration DO, 7, 4, 10, Cond.

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 6 = 43.632 litres
Avg. Flow Rate: ____ L/min.
Start: 12:40
Finish:
Sample intake depth:

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☐ Specific Cond. (µS/cm) or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
12:44	6	6.2	7.86	134.2	-16.2	3.36	3.801	silty, NO, NS
12:49	21	6.9	7.43	116.2	-201	2.05	4.664	" " "
12:56	35	6.4	8.34	508.1	-11.5	7.23	5.015	" " "
13:02	49	4.6	7.16	499.8	-14.1	7.99	5.035	" " "
13:10	63	4.7	7.06	498.3	-12.3	7.49	4.940	" " "
13:16	77	4.4	7.06	490.9	-232	7.05	4.890	slight clearing
* parameters	generally		stable @ >10 well	volumes drawn				

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes ____
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I X I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. ____
Field Dup. ____
Consumables: ☐ Waterra Tubing ____ ☐ HDPE/Teflon Tubing ____ ☐ Groundwater Filter
☐ Silicon Tubing ____ ☐ D.O. Ampoules ____ ☐ Footvalve

* Top of pipe ~ 0.860 m above ground surface

(MW-4)

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☒ Development
☐ Purging/Sampling

Well No.: K19-MW17-~~28~~
K19-MW17-25

Project Name: K-19 Trutch-AK Hwy
Location: Trutch BC
Weather: Rain **Temperature:** ~10 °C
GPS Coordinates:
Project No.: 1657709-5000
Date: 2017 - 23 - July
Completed By: DK
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 13:40
Depth to Product: — m Product Thickness: ____ m
Depth to Water (A): 3,923 m below ☐ TOP
Depth to Bottom of Well (B): 7,266 m below ☐ TOP
Diameter of Standpipe: — mm
Well Condition: 5]

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 6,686 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☒ Waterra
☐ Hydrolift
☐ Bailer (Type: ____)
☐ Peristaltic
☐ Submersible
☐ Bladder
Pump Details: footvalve

Multimeter Model: YSI ProPlus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model: —
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ____ ☐ pH7 ____
☐ pH10 ____
☐ 1413 us/cm ____
☒ Field Calibration DO, 7, 4, 10, Cond.

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 6 = 40,116 litres Start: 13:50 Finish:
Avg. Flow Rate: ____ L/min. Sample intake depth:

Date	Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
	13:53	5	4.7	7.58	900	19.1	6.40	5.940	silty, NO, NS
	14:09	15	→ dryed out; very slow recharge; return					7.112	" " "
24-Jul	11:45	25	6.3	—	322.3	—	11.54	3.914	silty; dry
24-Jul	1550	35	7.4	7.42	465.3	—	11.97	3.998	silty → dry
24-Jul	1700	45	6.6	6.60	435.6	—	11.20	4.974	clearing → dry

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes ____
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I F (I) I I I I I I I I I I (M) S Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. ____ Consumables: ☐ Waterra Tubing ____ ☐ HDPE/Teflon Tubing ____ ☐ Groundwater Filter
Field Dup. ____ ☐ Silicon Tubing ____ ☐ D.O. Ampoules ____ ☐ Footvalve

* slow recharge
* Top of pipe ~0.840 m above ground surface

proposed MW-7

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☑ Development
☐ Purging/Sampling

Well No.: K19-MW17-26

Project Name: K-19 Trutch-AK Hwy
Project No.: 1657709-5000
Location: Trutch BC
Date: 2017-JUL-26
Weather: clear **Temperature:** 16°C
Completed By: MZ
GPS Coordinates:
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 10:20
Depth to Product: — [illegible] m Product Thickness: — m
Depth to Water (A): [illegible] m below ☑ TOP 6.524
Depth to Bottom of Well (B): 11.63 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: new 2" slick-up

Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = ~~[illegible]~~ 10.2 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ______ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☑ Waterra
☐ Hydrolift
☐ Bailer (Type: ________)
☐ Peristaltic
☐ Submersible
☐ Bladder

Multimeter Model: YSI pro plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:

☐ Rental Equipment:
☐ Field Bump
☑ pH4 ☑ pH7
☑ pH10
☑ 1413 us/cm

Pump Details:
☐ D.O. Ampoule
☐ Field Calibration

WELL DEVELOPMENT/PURGING

(150L drill fluid used)

Purge Volume: Well. Vol. X 6 = ~~[illegible]~~ 61 litres
Avg. Flow Rate: ______ L/min.
Start: 26-JUL 10:35
Finish: development not completed
Sample intake depth: top of screen (bottom is in silt)

Date	Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
26-JUL	1035	16	11.1	7.29	565	—	8.02	3.911	very silty → dry
	1410	21	8.0	6.98	639	—	5.17	9.180	very silty → dry
27-JUL	0910	32	7.2	7.22	752	33.3	7.12	6.524	clearing → dry
27-JUL	1300	36	6.2	7.07	699.2	28.3	8.35	9.938	clearing → dry
27-JUL	1715	40	5.4	7.01	711.4	8.3	8.24	9.587	clearing → dry
28-JUL	0920	49	6.4	7.56	863	42.3	6.91	6.902	clear → dry
28-JUL	1655	56	6.4	7.13	612.0	19.9	6.78	8.616	clear → dry
29-JUL	1011	67	8.7	7.29	599.7	0.4	11.80	6.526	clear → dry

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear F [✓ III] IIIIIIIIIIIIIIIIIIIIIIIIIII [✓ III] S Very Silty

Analysis	Type		40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
			Container Size									
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. ________ Consumables: ☐ Waterra Tubing ______ ☐ HDPE/Teflon Tubing ______ ☐ Groundwater Filter
Field Dup. ________ ☐ Silicon Tubing ______ ☐ D.O. Ampoules ______ ☐ Footvalve

proposed MW-8

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☒ Development
☐ Purging/Sampling
Well No.: K19-MW17-27

Project Name: K-19 Trutch-AK Hwy
Location: Trutch BC
Weather: clear **Temperature:** 23°C
GPS Coordinates:
Project No.: 1657709-5000
Date: 2017-JUL-24
Completed By: MZ
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 12:18 (24-JUL-17)
Depth to Product: — m
Product Thickness: — m
Depth to Water (A): 4.436 m below ☒ TOP
Depth to Bottom of Well (B): 9.53 m below ☒ TOP
Diameter of Standpipe: 51 mm
Well Condition: new 2" stick-up
Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: — ppm
One Well Volume: 11.4
(B-A)*2.0 = ~~10.8~~ Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☒ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☐ Peristaltic
☐ Submersible
☐ Bladder

Multimeter Model: YSI pro plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redox) Meter Model:
Organic Vapour Meter Model:

☐ Rental Equipment:
☐ Field Bump
☒ pH4
☒ pH7
☒ pH10
☒ 1413 us/cm

Pump Details:
☐ D.O. Ampoule
☐ Field Calibration

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 6 = ~ ~~60~~ 68 litres
Avg. Flow Rate: L/min.
Start: 12:20
Finish: 25-JUL 13:30
Sample intake depth: throughout screen

Date	Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O₂* (mg/L)	DTW Water Level (m)	Remarks
24-JUL	12:32	12	9.8	—	671.4	—	7.29	4.436	very silty
	12:42	22	8.6	—	658.4	—	10.68	8.954	very silty dry @ 22L
24-JUL	1610	40	6.1	6.35	590.9	—	8.49	3.853	very silty
25-JUL	1000	56	7.7	7.27	600.1	-204.8	7.80	3.704	very silty (dry @ 16L)
								~~[illegible]~~	
25-JUL	1330	72	9.4	6.19	599.6	92.9	10.60	3.808	clearing → dry @ 16L

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear IIIIIIIIIIIIIIIIIIIIIIIIIII [✓ III]s Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No.
Field Dup.
Consumables: ☒ Waterra Tubing 11 ☐ HDPE/Teflon Tubing ☐ Groundwater Filter
☐ Silicon Tubing ☐ D.O. Ampoules ☒ Footvalve (1)

proposed MW-14

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☑ Development
☐ Purging/Sampling

Well No. K19-MW17-28

Project Name: K-19 Tetch-AK Hwy
Location: Tetch BC
Weather: clear **Temperature:** 23°C
GPS Coordinates:

Project No.: 1657709-5000
Date: 2017-JUL-24
Completed By: MZ
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 13:40 (24-JUL-17)
Depth to Product: — m Product Thickness: — m
Depth to Water (A): 5.519 m below ☑ TOP
Depth to Bottom of Well (B): 8.36 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: new 2" stick-up

Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = ~~5.69~~ 6.8 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☑ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☐ Peristaltic
☐ Submersible
☐ Bladder

Pump Details:

Multimeter Model: YSI pro plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redox) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☑ pH4 ☑ pH7
☑ pH10
☑ 1413 us/cm
☐ Field Calibration

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 6 = ~~38~~ 40.8 litres
Avg. Flow Rate: L/min.
Start: 1356 Finish:
Sample intake depth: throughout screen

Date	Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O₂* (mg/L)	DTW Water Level (m)	Remarks
24-JUL	1400	10	8.4	6.79	561.2	-50.7	7.01	5.519	very silty
	1418	16	9.8	6.61	581.4	-45.2	9.17		" " " ; dry
24-JUL	1646	28	6.7	6.16	483.8	—	10.02	5.377	clearing ↳ dry
25-JUL	1030	38	7.0	6.31	484.3	-140.5	5.86	4.930	clearing → dry
25-JUL	1420	49	8.4	6.51	499.7	61.5	7.74	4.994	clear → dry

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I s Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No.
Field Dup.

Consumables: ☑ Waterra Tubing 10m ☐ HDPE/Teflon Tubing ☐ Groundwater Filter
☐ Silicon Tubing ☐ D.O. Ampoules ☑ Footvalve

PROPOSED MW-16D

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☑ Development
☐ Purging/Sampling
Well No.: K19-MW17-29D

Project Name: K19 Field Inv.
Project No.: 1657709 / 5000
Location: Trutch, BC
Date: 25-JUL-17
Weather: clear **Temperature:** 24°C
Completed By: MZ
GPS Coordinates:
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 11:25
Depth to Product: – m
Product Thickness: – m
Depth to Water (A): 4.069 m below ☑ TOP
Depth to Bottom of Well (B): 9.00 m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition: new 2" flushmount
Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: – ppm
One Well Volume:
(B-A)*2.0 = 10 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☑ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☐ Peristaltic
☐ Submersible
☐ Bladder
Pump Details:

Multimeter Model: YSI pro plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☑ pH4 ☑ pH7
☑ pH10
☑ 1413 us/cm
☐ Field Calibration

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 6 = 60 litres (100 L drill water)
Start: Finish:
Avg. Flow Rate: L/min.
Sample intake depth:

	Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. (µS/cm) or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	Water Level (m)	Remarks
25-JUL	11:40	12	12.1	6.09	582.9	41.2	6.80	4.069	moderately silty
25-JUL	1510	20	10.1	6.86	921	-26.2	7.40	5.521	clearing → dry
26-JUL	1055	27	8.4	6.86	923	-94	8.53	5.223	clearing → dry
26-JUL	1430	39	8.0	6.83	841	-90.3	6.26	4.656	clearing → dry
27-JUL	0930	50	8.6	6.68	868	-21.4	6.52	4.707	clear → dry
	1310	64	5.9	6.79	890	-15.7	7.45	4.717	clear → dry
	1445	78	8.2	6.84	884	-14.1	5.78	4.803	clear → dry
	1730	104	6.5	6.71	855	-8.2	6.48	4.482	clear → dry

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear IIIIIIIIIIIIIIIIIIIIIIIIIIIIII S Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No.
Field Dup.
Consumables: ☑ Waterra Tubing 13m ☐ HDPE/Teflon Tubing ☐ Groundwater Filter
☐ Silicon Tubing ☐ D.O. Ampoules ☑ Footvalve

PROPOSED MW-16S

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☑ Development
☐ Purging/Sampling

Well No.: K19-MW17-29S

Project Name: K19 Field Inv.
Location: Trutch BC
Weather: PC **Temperature:** 14°C
GPS Coordinates:
Project No.: 1657709/5000
Date: 28-JUL-2017
Completed By: MZ
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 1005
Depth to Product: – m
Product Thickness: – m
Depth to Water (A): 3.647 m below ☑ TOP
Depth to Bottom of Well (B): 4.75 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: new 2" flushmount
Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: – ppm
One Well Volume:
(B-A)*2.0 = 2.2 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☑ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☐ Peristaltic
☐ Submersible
☐ Bladder

Multimeter Model: YSI pro plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:

☐ Rental Equipment:
☐ Field Bump
☑ pH4
☑ pH7
☑ pH10
☑ 1413 us/cm

Pump Details:
☐ D.O. Ampoule
☐ Field Calibration

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 6 = 13.2 litres
Avg. Flow Rate: L/min.
Start: 28 JUL 1010
Finish: development did not reach target volume
Sample intake depth:

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	Water Level (m)	Remarks
1010	5	8.2	6.48	1542	-42.5	2.46	3.647	(odour) moderately silty → dry
28-JUL 1220	7	8.8	6.52	1486	-27.7	3.86	4.344	moderately silty → dry
29-JUL 0935	10	9.8	6.43	1317	-16.3	7.42	4.262	moderately silty → dry
29-JUL 1555	11	—	(not enough purged		for parameters)		4.481	

* Record DO in Mg/L, not percentage

Comments:
Odour: ☑ Yes ☐ No If yes PHC-like odour, metallic sheen developing on purgewater
Sheen: ☑ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☑ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
			Container Size									
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No.
Field Dup.
Consumables: ☐ Waterra Tubing ☐ Silicon Tubing ☐ HDPE/Teflon Tubing ☐ D.O. Ampoules ☐ Groundwater Filter ☐ Footvalve

PROPOSED MWSVP_1

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☑ Development ☐ Purging/Sampling

Well No.: K19-MW 17-30

Project Name: K-19 Tntch-AK Hwy
Location: Tnten BC
Weather: partly cloudy **Temperature:** 22°C
GPS Coordinates:

Project No.: 1657709-5000
Date: 2017 - JUL - 26
Completed By: MZ
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 11:50
Depth to Product: — m Product Thickness: — m
Depth to Water (A): 4.840 m below ☑ TOP
Depth to Bottom of Well (B): 9.48 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: new 2" stick-up

Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: — ppm
One Well Volume: 9.3
(B-A)*2.0 = [redacted] Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump: ☑ Waterra ☐ Hydrolift ☐ Bailer (Type: ____) ☐ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: ____

Multimeter Model: YSI pro plus ☐ Rental Equipment:
pH/Temp Meter Model: ____
Conductivity Meter Model: ____
Dissolved Oxygen Meter Model: ____
ORP (Redex) Meter Model: ____
Organic Vapour Meter Model: ____
☐ D.O. Ampoule

☐ Field Bump
☑ pH4 ____ ☑ pH7 ____
☑ pH10 ____
☐ 1413 us/cm ____
☐ Field Calibration ____

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 6 = 56 [redacted] litres
Avg. Flow Rate: ____ L/min.

Start: JUL 26 11:55 Finish: JUL 27 16:25
Sample intake depth: ____

Date	Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
26-JUL	1200	13	7.8	7.81	449.7	—	8.92	4.840	very silty → dry
	1550	24	7.9	7.09	413.8	-22.6	9.22	5.632	clearing → 0 dry
27-JUL	1000	37	6.4	7.08	445.1	-13.8	8.95	4.832	clear 0 → dry
	[redacted]							[redacted]	
27-JUL	1350	49	6.7	7.13	431.2	-12.5	7.99	5.469	clear → dry
27-JUL	1625	60	6.5	6.99	428.0	13.7	9.14	6.012	clear → Dry

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes ____
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear 1 2 3 4 5 Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. ____ Consumables: ☑ Waterra Tubing 11 m ☐ HDPE/Teflon Tubing ____ ☐ Groundwater Filter
Field Dup. ____ ☐ Silicon Tubing ____ ☐ D.O. Ampoules ____ ☑ Footvalve

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☑ Development ☐ Purging/Sampling

PROPOSED MW-SVP-2

Well No.: K19-MW 17-31

Project Name: K-19 Tntch-AK Hwy
Location: Tntch BC
Weather: partly cloudy **Temperature:** 22°C
GPS Coordinates:

Project No.: 1657709-5000
Date: 2017-JUL-26
Completed By: MZ
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: ~~1220~~ 1010 27-JUL-2017
Depth to Product: 2.285 = m Product Thickness: — m
Depth to Water (A): ~~2.285~~ m below ☐ TOP
Depth to Bottom of Well (B): 7.44 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: new 2" stick-up

Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☐ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 10.3 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☑ Waterra ☐ Hydrolift ☐ Bailer (Type: ____) ☐ Peristaltic ☐ Submersible ☐ Bladder

Multimeter Model: YSI pro plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ____ ☑ pH7 ____
☐ pH10 ____
☐ 1413 us/cm ____
☐ Field Calibration ____

Pump Details: ____ ☐ D.O. Ampoule

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 6 = 62 litres
Avg. Flow Rate: ____ L/min.

Start: 26-JUL 16:00 Finish: 28-JUL 16:30
Sample intake depth: ____

Date	Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. (µS/cm or mS/cm) (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
26-JUL	1600	9						6.352	very silty → dry
	1010	24	5.7	7.22	471.8	3.8	8.54	2.285	silty → dry
27-JUL	1405	32	5.8	7.45	485.3	-2.2	9.57	5.474	cleaning → dry
27-JUL	1635	36	5.4	7.13	471.6	12.0	10.11	6.304	cleaning → dry
28-JUL	0935	51	5.6	7.20	490.2	6.0	—	2.220	clear → dry
28-JUL	1630	63	4.2	6.97	511.2	13.2	11.14	4.326	clear → dry

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes ____
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear 1 2 3 4 5 Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. ____ Consumables: ☑ Waterra Tubing 9m ☐ HDPE/Teflon Tubing ____ ☐ Groundwater Filter
Field Dup. ____ ☐ Silicon Tubing ____ ☐ D.O. Ampoules ____ ☑ Footvalve

Golder Associates

PROPOSED MW-19

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☑ Development
☐ Purging/Sampling

Well No.: K19-MW 17-32

Project Name: K-19 Trtch-AK Hwy
Location: Trtch BC
Weather: partly cloudy **Temperature:** 22°C
GPS Coordinates:

Project No.: 1657709-5000
Date: 2017-JUL-26
Completed By: MZ
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 1320
Depth to Product: – m
Product Thickness: – m
Depth to Water (A): 3.818 m below ☑ TOP
Depth to Bottom of Well (B): 5.84 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: new 2" stick-up

Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: – ppm
One Well Volume: 5.2
(B-A)*2.0 = ~~4X~~ Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☑ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☐ Peristaltic
☐ Submersible
☐ Bladder

Pump Details:

Multimeter Model: YSI pro plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☑ pH4
☑ pH7
☑ pH10
☑ 1413 us/cm
☐ Field Calibration

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 6 = ~~4X~~ 31 litres
Avg. Flow Rate: L/min.
Start:
Finish: 16:56 26-JUL-17
Sample intake depth: ~~Top of screen~~

Date 26-JUL

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
1330	6	12.1	7.19	714	–	7.87	4.781	very silty
1336	12	10.4	7.26	662.5	–	8.03	5.124	very silty → dry
1455	21	11.1	7.14	647.5	–	8.58	3.206	very silty → dry
1656	32	8.4	6.91	661.4	–	9.62	3.860	clearing → dry

26-JUL

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear IIIIIIIIIIIIIIIIIIIIIIIIIIIIII [✓ III] S Very Silty

Analysis	Type		40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
			Container Size									
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
										☐ Yes	☐ No	

SCN No.
Field Dup.
Consumables: ☑ Waterra Tubing 7m
☐ Silicon Tubing
☐ HDPE/Teflon Tubing
☐ D.O. Ampoules
☐ Groundwater Filter
☑ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☑ Development
☐ Purging/Sampling

Well No.: K19-MW 17-33

Project Name: K-19 Tatch-AK Hwy
Location: Tatch BC
Weather: overcast **Temperature:** 23°C
GPS Coordinates:

Project No.: 1657709-5000
Date: 2017-JUL-26
Completed By: MZ
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 10:30
Depth to Product: – m Product Thickness: – m
Depth to Water (A): 2.834 m below ☑ TOP
Depth to Bottom of Well (B): 5.78 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: new 2" stick-up

Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: – ppm
One Well Volume:
(B-A)*2.0 = 6 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☑ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☐ Peristaltic
☐ Submersible
☐ Bladder

Pump Details:

Multimeter	Model: YSI proplus
pH/Temp Meter	Model: ↓
Conductivity Meter	Model:
Dissolved Oxygen Meter	Model:
ORP (Redex) Meter	Model:
Organic Vapour Meter	Model:

☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☑ pH4 ☑ pH7
☑ pH10
☑ 1413 us/cm
☐ Field Calibration

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 6 = 36 litres
Avg. Flow Rate: L/min.
Start: JUL 27 10:35 Finish: JUL 28 1145
Sample intake depth:

Date	Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. (µS/cm) or mS/cm (circle one)	Redox (mV)	Diss. O₂* (mg/L)	DTW Water Level (m)	Remarks
27-JUL →	1035.	10	6.3	7.03	378.1	22.3	9.04	2.834	silty → dry
→	1415	18	5.6	7.17	352.2	-0.9	9.64	3.419	clearing → dry
27-JUL	1650	25	5.4	7.09	352.6	-0.8	10.54	4.115	clearing → dry
28-JUL	1145	36	6.5	6.98	350.2	24.1	8.13	2.878	clear to dry

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear ← (I I I) I I I I I I I I I I I I I I I I I I I I I I (I I I) I I I I Very Silty

Analysis	Type		40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No.
Field Dup.

Consumables: ☑ Waterra Tubing 8 m ☐ HDPE/Teflon Tubing ☐ Groundwater Filter
☐ Silicon Tubing ☐ D.O. Ampoules ☑ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☑ Development
☐ Purging/Sampling
Well No.: K19-MW17-34

Project Name: K-19 Tritch-AK Hwy
Location: Tritch BC
Weather: partly cloudy **Temperature:** 23°C
GPS Coordinates:
Project No.: 1657709-5000
Date: 2017-JUL-27
Completed By: MZ
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 1225
Depth to Product: – m
Product Thickness: – m
Depth to Water (A): 4.195 m below ☑ TOP
Depth to Bottom of Well (B): 7.29 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: new 2" stick-up
Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: – ppm
One Well Volume: 8
(B-A)*2.0 = [illegible] Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☑ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☐ Peristaltic
☐ Submersible
☐ Bladder

Multimeter Model: YSI pro plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☑ pH4
☑ pH7
☑ pH10
☑ 1413 us/cm
☐ Field Calibration

Pump Details:

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 6 = ~~37~~ 48 litres
Start: 27-JUL 1235
Finish: 28-JUL 1255
Avg. Flow Rate: L/min.
Sample intake depth:

Date	Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
27-JUL	1240	11	8.8	7.63	535.5	-0.5	10.52	4.195	silty → dry
	1420	20	6.7	6.98	451.6	11.9	8.00	4.155	clearing → dry
27-JUL	1700	30	7.0	6.86	405.4	6.9	8.01	3.691	clear → dry
28-JUL	1155	41	6.3	7.05	407.8	-0.1	7.25	3.238	clear → dry
28-JUL	1255	52	6.0	6.97	394.1	-27.5	6.78	4.834	clear → dry

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII Very Silty

Analysis	Type		40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

(Container Size spans 40 mL – 4 L)

SCN No.
Field Dup.
Consumables: ☑ Waterra Tubing 9m ☐ HDPE/Teflon Tubing ☐ Groundwater Filter
☐ Silicon Tubing ☐ D.O. Ampoules ☑ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☑ Development
☐ Purging/Sampling
Well No.: K19-MW 17-35D

Project Name: K-19 Trutch-AK Hwy
Location: Trutch BC
Weather: partly cloudy Temperature: 24°C
GPS Coordinates:
Project No.: 1657709-5000
Date: 2017-JUL-27
Completed By: MZ
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 15 50
Depth to Product: — m
Product Thickness: — m
Depth to Water (A): 5.432 m below ☑ TOP
Depth to Bottom of Well (B): 7.60 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: new 2" flushmount
Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 8 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☑ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☐ Peristaltic
☐ Submersible
☐ Bladder
Pump Details:

Multimeter Model:
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ☐ pH7
☐ pH10
☐ 1413 us/cm
☐ Field Calibration

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 6 = 48 litres
Start: 10 30 Finish: 11 00
Avg. Flow Rate: L/min.
Sample intake depth:

Date	Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
28-Jul	1030	20	8.3	6.59	529.4	-55.0	3.76	3.617	very silty, odour
	1045	40	9.3	6.67	527.3	-66.3	0.16	6.941	very silty, odour
28-Jul	1100	50	8.4	6.49	523.3	-68.0	1.98	6.742	silty, odour

* Record DO in Mg/L, not percentage

Comments:
Odour: ☑ Yes ☐ No If yes strong PHC-like odours
Sheen: ☑ Yes ☐ No If yes ☑ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear IIIIIIIIIIIIIIIIIIIIIIIIIIIIII s Very Silty

Analysis	Type		40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
			Container Size									
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No.
Field Dup.
Consumables: ☐ Waterra Tubing ☐ HDPE/Teflon Tubing ☐ Groundwater Filter
☐ Silicon Tubing ☐ D.O. Ampoules ☐ Footvalve

PROPOSED MW-15 S

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☒ Development
☐ Purging/Sampling
Well No.: K19-MW 17-35S

Project Name: K-19 Tritch-AK Hwy
Location: Tritch BC
Weather: partly cloudy **Temperature:** 24°C
GPS Coordinates:
Project No.: 1657709-5000
Date: 2017-JUL-27
Completed By: MZ
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 1610
Depth to Product: — m
Product Thickness: — m
Depth to Water (A): 4.666 m below ☒ TOP
Depth to Bottom of Well (B): 4.91 m below ☒ TOP
Diameter of Standpipe: 51 mm
Well Condition: new 2" flushmount
Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 2.8 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☒ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☐ Peristaltic
☐ Submersible
☐ Bladder

Multimeter Model: YSI proplus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:

☐ Rental Equipment:
☐ Field Bump
☒ pH4
☒ pH7
☒ pH10
☒ 1413 us/cm

Pump Details:
☐ D.O. Ampoule
☐ Field Calibration

WELL DEVELOPMENT/PURGING

(10 L drill water used)

Purge Volume: Well. Vol. X 6 = 17 litres
Start: 28-JUL 11:30
Finish: 29-JUL 09:20
Avg. Flow Rate: L/min.
Sample intake depth:

Date	Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
28-JUL	1130	6	9.4	6.47	327.8	40.8	7.02	3.503	moderately silty → dry
	1240	9	9.8	6.53	299.2	34.8	6.88	4.263	moderately silty → dry
28-JUL	1605	13	10.3	6.30	270.9	52.0	7.90	4.154	clearing → dry
29-JUL	0920	19	9.4	6.61	237.6	60.2	9.02	3.557	clear → dry

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☐ No If yes
Sheen: ☐ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear F IIIIIIIIIIIIIIIIIIIIIIIIIIIIII S Very Silty

Analysis	Type		40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
			Container Size									
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No.
Field Dup.
Consumables: ☐ Waterra Tubing ☐ HDPE/Teflon Tubing ☐ Groundwater Filter
☐ Silicon Tubing ☐ D.O. Ampoules ☐ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☐ Purging/Sampling

Well No.: K19A-09 MW-02

Project Name: K-19 Tntch-AK Hwy
Location: Tntch BC
Weather: Blue sky **Temperature:** 14°C
GPS Coordinates:

Project No.: 1657709-5000
Date: 2017 - 19 - 17
Completed By: AW/DK
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 10:15
Depth to Product: — m Product Thickness: — m
Depth to Water (A): 3.466 m below ☐ TOP
Depth to Bottom of Well (B): 10.469 m below ☐ TOP
Diameter of Standpipe: ____ mm
Well Condition:

Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☐ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 14.0 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump
☐ Waterra
☐ Hydrolift
☐ Bailer (Type: ____)
☑ Peristaltic
☐ Submersible
☐ Bladder

Pump Details: Geopump

Multimeter Model: YSI PW PRO ☐ Rental Equipment:
pH/Temp Meter Model: BOR142096
Conductivity Meter Model: ____ ☐ Field Bump
Dissolved Oxygen Meter Model: ____ ☐ pH4 ____ ☐ pH7 ____
ORP (Redex) Meter Model: ____ ☐ pH10 ____
Organic Vapour Meter Model: ____ ☐ 1413 us/cm ____

☐ D.O. Ampoule
☑ Field Calibration AW/DK

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 4.2 = 42 litres
Avg. Flow Rate: 0.25 L/min.
Start: 1028 Finish: ____
Sample intake depth: ____

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☐ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
10:32	1	5.7	6.91	2655	29.2	2.74	3.573	
10:38	2	5.6	6.87	2636	23.5	2.99	3.551	
10:47	4	5.2	6.93	2635	17.02	3.37	3.554	
10:52	45	5.2	6.84	2617	13.5	3.55	3.555	
10:57	5	5.2	6.84	2621	9.7	3.74	3.560	
11:03	6	5.1	6.94	2615	7.4	3.83	3.565	
11:08	7	5.2	6.84	2614	5.4	3.78	3.565	- Sampled

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes ____
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear (1) I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
VOCs Ltd	☐ Plastic	☑ Glass	1							☑ Yes	☐ No	HCl
VOCs Metals	☐ Plastic	☐ Glass		1						☑ Yes	☐ No	HNO_3
PAH	☐ Plastic	☑ Glass			2					☐ Yes	☑ No	✓
VPH	☐ Plastic	☑ Glass	3							☐ Yes	☑ No	✓
Chloride	☑ Plastic	☐ Glass		1						☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03830-05 Consumables: ☐ Waterra Tubing ____ ☑ HDPE/Teflon Tubing ____ ☐ Groundwater Filter
Field Dup. ____ ☑ Silicon Tubing ____ ☐ D.O. Ampoules ____ ☐ Footvalve

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☒ Purging/Sampling Well No.: K19-02MW-03

Project Name: K-19 Tntch-AK Hwy **Project No.:** 1657709-5000
Location: Tntch BC **Date:** 2017-21-July
Weather: Sunny w/clouds **Temperature:** ~15°C **Completed By:** D. Klamer
GPS Coordinates: **Reviewed By:**

MONITORING WELL INFORMATION

Time of Measurement: 15845
Depth to Product: — m Product Thickness: — m
Depth to Water (A): 4.188 m below ☐ TOP
Depth to Bottom of Well (B): 7.320 m below ☐ TOP
Diameter of Standpipe: 5" mm
Well Condition: Loose @ coupler; appears generally intact

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 6.282 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = — Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type:) ☒ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: Geopump

Multimeter Model: YSI Pro Plus ☐ Rental Equipment:
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model: ↓
Organic Vapour Meter Model: —
☐ D.O. Ampoule

☐ Field Bump
☐ pH4 ☐ pH7
☐ pH10
☐ 1413 us/cm
☒ Field Calibration DO, 7, 4, 10, conductivity

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 18.846 litres Start: 15851 Finish: 16826
Avg. Flow Rate: ~200 mL/min L/min. Sample intake depth: ~0.50 - 0.75 m above bottom

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
15:53	0.8	6.9	7.22	589.6	-96.8	0.38	4.235	clear, NO, NS
15:57	1.2	6.2	7.35	614.8	-118.7	0.19	4.257	" " "
16:02	2.2	5.8	7.39	656.8	-121.3	0.14	4.287	" " "
16:07	3.5	6.6	7.44	647.9	-123.0	0.11	4.283	" " "
16:12	4.5	6.9	7.40	646.7	-121.4	0.09	4.287	" " "
* parameters stable, sampling at 16:13 * Finish sampling at 16:26 - DTW =							4.296	" " "

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear |||||||||||||||||||||||||||||||||||| Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
L/H/PAH	☐ Plastic	☐ Glass			2					☐ Yes	☒ No	sodium bisulfate
BTEX/VPH	☐ Plastic	☐ Glass	3							☐ Yes	☒ No	" "
F_2-F_4	☐ Plastic	☐ Glass			2					☐ Yes	☒ No	none
D. metals/hardness	☐ Plastic	☐ Glass		2						☒ Yes	☐ No	nitric acid
dissolved mercury	☐ Plastic	☐ Glass	1							☒ Yes	☐ No	HCl
chloride	☐ Plastic	☐ Glass		1						☐ Yes	☒ No	none
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

11 containers

SCN No. 03816-03 Consumables: ☐ Waterra Tubing ☒ HDPE/Teflon Tubing ~0.5m ☒ Groundwater Filter
Field Dup. — ☒ Silicon Tubing ~0.10m ☐ D.O. Ampoules ☐ Footvalve

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☑ Purging/Sampling Well No.: K19-01-MW-06

Project Name: K-19 Tntch-AK Hwy **Project No.:** 1657709-5000
Location: Tntch BC **Date:** 2017-17-17
Weather: Overcast **Temperature:** 14°C **Completed By:** AW
GPS Coordinates: **Reviewed By:**

MONITORING WELL INFORMATION

Time of Measurement: 14:10
Depth to Product: ___ m Product Thickness: ___ m
Depth to Water (A): 4.111 m below ☑TOP (Bolton, Flush Mount Shelter)
Depth to Bottom of Well (B): 8.145 m below ☐TOP
Diameter of Standpipe: 51 mm
Well Condition: Dent, Bullet holes, bolted

Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☐ No
Well Headspace: ___ ppm
One Well Volume:
(B-A)*2.0 = 8.0 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ___ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump
☐ Waterra
☐ Hydrolift
☐ Bailer (Type: ___)
☑ Peristaltic
☐ Submersible
☐ Bladder
Pump Details: Geopump

Multimeter Model: YSI ProPlus BVR1429162
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ___ ☐ pH7 ___
☐ pH10 ___
☐ 1413 us/cm ___
☑ Field Calibration AW

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 12 litres Start: 14:15 Finish:
Avg. Flow Rate: 0.2 L/min. Sample intake depth:

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
14:20	1	6.5	6.16	6152	-0.1	0.61	4.204	
14:25	2	6.1	6.17	6232	-5.7	1.19	4.216	
14:30	3	6.0	6.18	6261	-9.7	1.43	4.224	
14:36	4	6.2	6.16	6313	-12.4	1.89	4.241	
14:44	5	6.1	6.18	6350	-15.1	2.40	4.244	
14:53	6	5.8	6.14	6371	-17.1	2.43	4.258	
14:58	7	5.4	6.18	6412	-18.7	2.37	4.271	
15:04	8	5.8	6.15	6428	-19.9	2.32	4.280	
15:15	9	5.7	6.18	6433	-22.1	2.30	4.241	Sampled!

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes
Sheen: ☐ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear (1) 2 3 4 5 6 7 8 9 10 Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
Diss Metals	☑ Plastic	☐ Glass		1						☐ Yes	☐ No	HNO_3
Diss Hg	☐ Plastic	☑ Glass	1							☑ Yes	☐ No	HCl
LEPH/HEPH	☐ Plastic	☑ Glass			2					☐ Yes	☐ No	✓
Chloride	☑ Plastic	☐ Glass		1						☐ Yes	☐ No	
Sodium	☐ Plastic	☐ Glass		1						☐ Yes	☐ No	HNO_3
BTEX, ~~PHC~~ VPH	☐ Plastic	☑ Glass	3							☐ Yes	☐ No	✓
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03830-02 Consumables: ☐ Waterra Tubing ___ ☑ HDPE/Teflon Tubing ___ ☑ Groundwater Filter
Field Dup. 03830-03 ☑ Silicon Tubing ___ ☐ D.O. Ampoules ___ ☐ Footvalve

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☐ Purging/Sampling

Well No.: K19-09MW-01

Project Name: K-19 Tntch-AK Hwy
Location: Tntch BC
Weather: Sunny **Temperature:** ~15°C
GPS Coordinates:

Project No.: 1657709-5000
Date: 2017-21-July
Completed By: D. Klammer
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 10:51
Depth to Product: - m Product Thickness: - m
Depth to Water (A): 4.541 m below ☒ TOP
Depth to Bottom of Well (B): 9.412 m below ☒ TOP
Diameter of Standpipe: stmg mm
Well Condition: Good

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: - ppm
One Well Volume:
(B-A)*2.0 = 9.742 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump
☐ Waterra
☐ Hydrolift
☐ Bailer (Type: ____)
☒ Peristaltic
☐ Submersible
☐ Bladder

Pump Details: Geo pump

Multimeter Model: YSI ProPlus ☐ Rental Equipment:
pH/Temp Meter Model:
Conductivity Meter Model: ☐ Field Bump
Dissolved Oxygen Meter Model: ☐ pH4 ____ ☐ pH7 ____
ORP (Redex) Meter Model: ☐ pH10 ____
Organic Vapour Meter Model: - ☐ 1413 us/cm ____

☐ D.O. Ampoule
☒ Field Calibration DO, 7, 4, 10, Conductivity

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 29.226 litres
Avg. Flow Rate: ~200 ml/min L/min.

Start: 11:08 Finish: 12:01
Sample intake depth: ~0.50-0.75 m above bottom

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
11:15	0.3	5.1	5.82	2754	39.5	0.33	4.746	clear, NO, NS
11:20	1.5	5.8	5.79	2863	31.0	0.42	4.835	" " "
11:25	2.5	5.8	5.80	2834	26.3	0.62	4.884	" " "
11:30	3.7	5.6	5.80	2852	22.2	0.96	4.915	" " "
11:35	4.5	5.5	5.81	2862	19.5	1.48	4.940	" " "
11:40	5.5	5.3	5.81	2858	18.0	1.49	4.962	" " "
11:45	6.5	5.3	5.81	2856	13.2	1.51	4.978	" " "
*Sample @ 11:46, parameters stable.					*After Sampling*		5.021	" " "

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes ____
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear |||||||||||||||||||||||||||||||||||| Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
BTEX/VPH	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	sodium bisulfate
L/H/PAH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	" "
dissolved metals	☒ Plastic	☐ Glass		2						☒ Yes	☐ No	nitric acid
T. Hg	☐ Plastic	☒ Glass	1							☒ Yes	☐ No	HCl
Chloride	☒ Plastic	☐ Glass		1						☐ Yes	☐ No	none
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

* 9 bottles total

SCN No. 03816-01 Consumables: ☐ Waterra Tubing ____ ☒ HDPE/Teflon Tubing ¼" ~10.5m ☒ Groundwater Filter
Field Dup. - ☒ Silicon Tubing ~0.10 ☐ D.O. Ampoules ____ ☐ Footvalve

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☑ Purging/Sampling

Well No.: K19A-10[redacted]
MW-03D[redacted]

Project Name: K-19 Tritch-AK Hwy
Location: Triten BC
Weather: Overcast potential Storm **Temperature:**
GPS Coordinates:
Project No.: 1657709-5000
Date: 2017-07-14
Completed By: AW
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 3:11
Depth to Product: — m
Product Thickness: — m
Depth to Water (A): 6.221 m below ☑ TOP
Depth to Bottom of Well (B): 11.301 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: OK
Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 10.1 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☑ Peristaltic
☐ Submersible
☐ Bladder
Pump Details: Geopump

Multimeter Model: YSI Pro Plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redox) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Rental Equipment:
☑ Field Bump
☑ pH4
☐ pH7
☑ pH10
☑ 1413 us/cm
☑ Field Calibration AW

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 30.4 litres
Avg. Flow Rate: 0.25 L/min.
Start:
Finish:
Sample intake depth:

te

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O₂* (mg/L)	DTW Water Level (m)	Remarks
3:21	1	7.0	6.81	1119	-144.6	2.38	6.225	Clear
3:26	2	6.6	6.89	1113	-115.9	2.61	6.229	Clear.
3:32	3	6.6	6.79	1101	-117.3	2.72	6.226	Clear.
3:37	4	6.2	6.84	1099	-133.8	2.61	6.226	Clear
3:43	5	6.7	6.80	1100	-117.8	2.51	6.226	Clear
3:50	6	6.1	6.83	1092	-121.1	2.55	6.229	Clear
								Sampled!

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
Diss Hg	☐ Plastic	☑ Glass	1							☑ Yes	☐ No	HCl
Diss Metal	☑ Plastic	☐ Glass		1						☑ Yes	☐ No	HNO₃
VPH	☐ Plastic	☑ Glass	3							☐ Yes	☑ No	✓
VOC	☐ Plastic	☑ Glass	3							☐ Yes	☑ No	✓
Leph	☐ Plastic	☑ Glass			2					☐ Yes	☑ No	✓
Chlor.IAC	☑ Plastic	☐ Glass		1						☐ Yes	☑ No	X
Na	☑ Plastic	☐ Glass		1						☑ Yes	☑ No	✓

SCN No. 03808-06
Field Dup.
Consumables: ☑ ~~Waterra Tubing~~ ☑ Silicon Tubing ☑ HDPE/Teflon Tubing ☐ D.O. Ampoules ☑ Groundwater Filter ☐ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☑ Purging/Sampling

Well No.: K19 10MW-10

Project Name: K-19 Tretch-AK Hwy
Project No.: 1657709-5000
Location: Trutch BC
Date: 2017 - 21 - 17
Weather: Sunny
Temperature:
Completed By:
GPS Coordinates:
Reviewed By:

MONITORING WELL INFORMATION

potential product? <0.001?

Time of Measurement: 11:20
Depth to Product: 0.001 m
Product Thickness: — m
Depth to Water (A): 4.72 m below ☑ TOP
Depth to Bottom of Well (B): 9.494 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: OK
Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: — ppm
One Well Volume: (4.7) 2
(B-A)*2.0 = 9.4 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump
☐ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☑ Peristaltic
☐ Submersible
☐ Bladder

Pump Details: Geopump

Multimeter Model: YSI Pro Plus. BVK 142962
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4
☐ pH7
☐ pH10
☐ 1413 us/cm
☐ Field Calibration

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 28.2 litres
Start:
Finish:
Avg. Flow Rate: 0.0625 L/min.
Sample intake depth:

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
11:31	1	8.0	6.57	91.4	30.4	15.21	5.025	
11:38	2	7.3	6.32	62.3	41.4	15.40	5.151	
11:44	3	6.8	6.35	60.7	50.2	18.54	5.210	
11:51	4	7.1	6.29	61.7	52.0	17.29	5.249	
11:59	4.5	7.3	6.18	116.9	61.7	14.63	5.292	
12:07	5	7.5	6.33	153.3	51.2	13.71	5.299	
12:13	5.5	7.4	6.38	185.9	48.5	13.15	5.300	
12:18	6	7.2	6.40	199.0	47.3	13.35	5.309	-Sampled

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☐ No If yes
Sheen: ☐ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
VPH/BTEX	☐ Plastic	☑ Glass	3							☐ Yes	☑ No	✓
PAH	☐ Plastic	☑ Glass			2					☐ Yes	☑ No	✓
F2-F4	☐ Plastic	☑ Glass			2					☐ Yes	☑ No	no
Diss metal	☑ Plastic	☐ Glass		1						☑ Yes	☐ No	HNO_3
Diss Hg	☐ Plastic	☑ Glass	1							☑ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03816-05
Field Dup. 03816-06

Consumables: ☐ Waterra Tubing ☐ Silicon Tubing ☐ HDPE/Teflon Tubing ☐ D.O. Ampoules ☐ Groundwater Filter ☐ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☒ Purging/Sampling Well No.: K19B-10MW-15

Project Name: K-19 Tntch-AK Hwy **Project No.:** 1657709-5000
Location: Tntch BC **Date:** 2017-26-2017
Weather: Sunny w/ clouds **Temperature:** ~15°C **Completed By:** DK
GPS Coordinates: **Reviewed By:**

MONITORING WELL INFORMATION

Time of Measurement: 09:28
Depth to Product: – m Product Thickness: ____ m
Depth to Water (A): 7.183 m below ☐ TOP
Depth to Bottom of Well (B): 11.573 m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: – ppm
One Well Volume:
(B-A)*2.0 = 8.78 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type: ____) ☒ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: Geopump

Multimeter Model: YSI Pro Plus
pH/Temp Meter Model: ↓
Conductivity Meter Model: ↓
Dissolved Oxygen Meter Model: ↓
ORP (Redex) Meter Model: ↓
Organic Vapour Meter Model: –

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ____ ☐ pH7 ____
☐ pH10 ____
☐ 1413 us/cm ____
☐ D.O. Ampoule
☒ Field Calibration 7, 4, 10, DO, 1413

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 26.34 litres
Avg. Flow Rate: ~0.2 L/min.

Start: 09:38 Finish: 10:10
Sample intake depth: ~0.50-0.75 m above bottom

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
09:40	0.2	7.2	6.97	417.7	-51.4	0.34	7.207	clear, NO, NS
09:45	1.5	6.5	6.70	414.4	-47.8	0.39	7.209	" " "
09:50	2.2	6.4	6.64	413.0	-48.1	0.38	7.213	" " "
09:55	3.5	6.3	6.63	415.1	-49.9	0.36	7.223	" " "
* stable → sampling @ 09:56; finished sampling @ 10:10 →							7.221	

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes ____
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear |||||||||||||||||||||||||||||||| Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
BTEX/VPH/LOC	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	sodium bisulfate
L/H/PAH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	" "
chloride	☒ Plastic	☐ Glass		1						☐ Yes	☒ No	none
d. metals	☒ Plastic	☐ Glass		1						☒ Yes	☐ No	HNO_3
d. Hg	☐ Plastic	☒ Glass	1							☒ Yes	☐ No	HCl
F2-F4	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	none
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03797-01 Consumables: ☐ Waterra Tubing ____ ☒ HDPE/Teflon Tubing ~0.5 m ☒ Groundwater Filter
Field Dup. – ☒ Silicon Tubing ~0.50 m ☐ D.O. Ampoules ____ ☐ Footvalve

#10 Lab

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☑ Purging/Sampling Well No. KG MW-24

Project Name: K-19 Tntch-AK Hwy **Project No.:** 1657709-5000
Location: Tntch BC **Date:** 2017-21-17
Weather: Sunny **Temperature:** **Completed By:** AW
GPS Coordinates: **Reviewed By:**

MONITORING WELL INFORMATION

Time of Measurement: 9:25
Depth to Product: — m Product Thickness: m
Depth to Water (A): 3.999 m below ☐ TOP
Depth to Bottom of Well (B): 16.18 m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition: OK

Tidally Influenced: ☐ Yes ☐ No
Pressurized: ☐ Yes ☐ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 12.6 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type:) ☐ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: Grundfos

Multimeter Model: YSI 80 PLUS
pH/Temp Meter Model: BARNANT 2
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ☐ pH7
☐ pH10
☐ 1413 us/cm
☑ Field Calibration OK

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 37.8 litres Start: Finish:
Avg. Flow Rate: L/min. Sample intake depth:

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☐ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
	1						4.361	
9:51	2	6.6	6.28	1476	0.5	8.79	4.551	
9:56	3	7.2	6.28	1467	1.5	8.53	4.696	
10:01	35	6.7	6.29	1483	-3.0	9.53	4.784	
10:06	40	7.9	6.30	1463	-8.9	7.89	4.876	
10:12	45	7.1	6.29	1489	-10.5	9.33	4.839	
10:16	5	7.3	6.28	1461	-18.0	[illegible]	4.970	
10:20	5.5	7.2	6.30	1472	-35.6	9.17	5.011	
10:24	6	7.1	6.29	1461	-23.4	9.21	5.039	
10:30	6.5	7.2	6.28	1457	-22.1	9.09	5.053	
10:35	7	7.2	6.29	1459	-17.7	9.06	5.079	→ sampled!

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☐ No If yes
Sheen: ☐ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear IIIII(I)IIIIIIIIIIIIIIIIIIIIIIIIII Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
BTEX / VOC/NPA	☐ Plastic	☐ Glass	3							☐ Yes	☐ No	Yes
PAH	☐ Plastic	☐ Glass			2					☐ Yes	☐ No	Yes
F2-F4	☐ Plastic	☐ Glass			2					☐ Yes	☐ No	No
Chloride	☐ Plastic	☐ Glass		1						☐ Yes	☐ No	No
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
Diss. Hg	☐ Plastic	☐ Glass	1							☐ Yes	☐ No	HCl
Dissolved Metals	☐ Plastic	☐ Glass		1						☐ Yes	☐ No	HNO_3

SCN No. 03816-04 Consumables: ☐ Waterra Tubing ☑ HDPE/Teflon Tubing ☑ Groundwater Filter
Field Dup. ☐ Silicon Tubing ☐ D.O. Ampoules ☐ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☑ Purging/Sampling

Well No.: K19a-10MW-29

Project Name: K-19 Trutch-AK Hwy
Project No.: 1657709-5000
Location: Trutch BC
Date: 2017-21-17
Weather: Sunny
Temperature:
Completed By: AW
GPS Coordinates:
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 13:38
Depth to Product: — m
Product Thickness: m
Depth to Water (A): 3.937 m below ☐ TOP
Depth to Bottom of Well (B): 4.035 m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition: OK
Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: ppm
One Well Volume:
(B-A)*2.0 = 0.196 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

DRY! not enough to sample.

Pump
- ☐ Waterra
- ☐ Hydrolift
- ☐ Bailer (Type:)
- ☑ Peristaltic
- ☐ Submersible
- ☐ Bladder

Pump Details:

Multimeter Model:
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4
☐ pH7
☐ pH10
☐ 1413 us/cm
☐ Field Calibration

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X = litres
Start:
Finish:
Avg. Flow Rate: L/min.
Sample intake depth:

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☐ Specific Cond. µS/cm or mS/cm *(circle one)*	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
Date								

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☐ No If yes
Sheen: ☐ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No.
Field Dup.
Consumables: ☐ Waterra Tubing ☐ Silicon Tubing ☐ HDPE/Teflon Tubing ☐ D.O. Ampoules ☐ Groundwater Filter ☐ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☑ Purging/Sampling Well No.: K19-MW 16-015

Project Name: K-19 Tritech-AK Hwy **Project No.:** 1657709-5000
Location: Tritech, BC **Date:** 2017-07-15
Weather: Sunny! **Temperature:** 16°C **Completed By:** AW
GPS Coordinates: **Reviewed By:**

MONITORING WELL INFORMATION

Time of Measurement: 3:20
Depth to Product: — m Product Thickness: — m
Depth to Water (A): 5.97 m below ☑ TOP
Depth to Bottom of Well (B): 6.00 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: OK!

Tidally Influenced: ☐ Yes ☐ No
Pressurized: ☐ Yes ☐ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 0.06 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = — Litres - for a 38 mm (1.5 inch) diameter well

DRY!!

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type:) ☐ Peristaltic ☐ Submersible ☐ Bladder
Pump Details:

Multimeter Model:
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump ☐ pH4 ☐ pH7 ☐ pH10 ☐ 1413 us/cm
☐ Field Calibration

Could NOT SAMPLE

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X = litres Start: Finish:
Avg. Flow Rate: L/min. Sample intake depth:

te

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☐ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☐ No If yes
Sheen: ☐ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No.
Field Dup.
Consumables: ☐ Waterra Tubing ☐ HDPE/Teflon Tubing ☐ Groundwater Filter
☐ Silicon Tubing ☐ D.O. Ampoules ☐ Footvalve

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☑ Purging/Sampling

Well No.: K19-MW 16-01D

Project Name: K-19 Tritch-AK Hwy
Location: Triton BC
Weather: Raining **Temperature:**
GPS Coordinates:

Project No.: 1657709-5000
Date: 2017 - [illegible] - 07 - 15
Completed By: AW
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 2.00
Depth to Product: — m Product Thickness: — m
Depth to Water (A): 6.15 m below ☐ TOP
Depth to Bottom of Well (B): 7.99 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: OK

Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 3.6 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump
☐ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☑ Peristaltic
☐ Submersible
☐ Bladder

Pump Details: Geo Pump

Multimeter Model: YSI Pro Plus ☐ Rental Equipment:
pH/Temp Meter Model:
Conductivity Meter Model: ☐ Field Bump
Dissolved Oxygen Meter Model: ☑ pH4 ☐ pH7
ORP (Redox) Meter Model: ☑ pH10
Organic Vapour Meter Model: ☑ 1413 us/cm
☐ D.O. Ampoule
☑ Field Calibration AW

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = [illegible] = 14.4 litres
Avg. Flow Rate: 0.2 L/min.
Start: Finish:
Sample intake depth:

te

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O₂* (mg/L)	DTW Water Level (m)	Remarks
2.00	1	6.4	6.30	1092	-9.0	2.10	6.180	Clear
2:11	2	5.4	6.38	1096	-30.1	3.01	6.185	Clear.
2:17	3	5.2	6.40	1019	-30.2	3.29	6.189	Clear.
2:23	4	5.8	6.40	1017	-18.4	3.85	6.181	Technical difficulty w/ flow through
2:34	5	7.0	6.44	1090	-35.5	3.24	6.184	Fixed!
2:41	5.5	6.9	6.45	1088	-41.9	3.37	6.182	
2:47	6	6.7	6.49	1094	-45.6	3.46	6.180	—Sampled.

* Record DO in Mg/L, not percentage

Comments:

Odour: ☐ Yes ☑ No If yes
Sheen: ☑ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☑ Metallic-like
Turbidity: Clear ☑ I I [✓ I I I I] I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
Diss metal	☑ Plastic	☐ Glass		1						☑ Yes	☐ No	HNO3
Diss Hg	☐ Plastic	☑ Glass	1							☑ Yes	☐ No	HCl
VOC/VPH	☐ Plastic	☑ Glass	3							☐ Yes	☑ No	✓
LEPH/PAH	☐ Plastic	☑ Glass			2					☐ Yes	☑ No	✓
Chloride	☑ Plastic	☐ Glass		1						☐ Yes	☑ No	X
Sodium	☑ Plastic	☐ Glass		1						☐ Yes	☑ No	— HNO3
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03809-03
Field Dup.

Consumables: ☐ Waterra Tubing ☑ HDPE/Teflon Tubing ☑ Groundwater Filter
☑ Silicon Tubing ☐ D.O. Ampoules ☐ Footvalve

14-JULY-2017.

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☑ Purging/Sampling Well No.: K19-mw16 ~~230~~ 203D

Project Name:	K-19 Tntch-AK Hwy	**Project No.:**	1657709-5000
Location:	Tntch BC	**Date:**	2017-07-14
Weather:	Rainfall/sn **Temperature:** 16°C	**Completed By:**	AW
GPS Coordinates:		**Reviewed By:**	

MONITORING WELL INFORMATION

Time of Measurement:	13:45	Tidally Influenced:	☐ Yes ☑ No
Depth to Product:	— m	Product Thickness: — m	Pressurized: ☐ Yes ☐ No
Depth to Water (A):	6.196 m below ☑ TOP		Well Headspace: ____ ppm
Depth to Bottom of Well (B):	9.104 m below ☑ TOP		One Well Volume:
Diameter of Standpipe:	51 mm		(B-A)*2.0 = 5.8 Litres - for a 51 mm (2.0 inch) diameter well
Well Condition:	OK		(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump: ☐ Waterra ☐ Hydrolift ☐ Bailer (Type: ____) ☑ Peristaltic ☐ Submersible ☐ Bladder

Pump Details: Geo pump

Multimeter Model: YSI ProPlus ☐ Rental Equipment:
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redox) Meter Model:
Organic Vapour Meter Model:

☐ Field Bump
☑ pH4 ____ ☐ pH7 ____
☐ pH10 ____
☐ 1413 us/cm ____
☐ Field Calibration AW

☐ D.O. Ampoule

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 17.4 litres Start: ____ Finish: ____

Avg. Flow Rate: 0.25 L/min. Sample intake depth: ____

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☐ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
1:57	1	8.2	6.81	4528	24.6	1.74	6.205	Clear.
2:04	2	7.0	6.75	1665	-78.1	2.03	6.209	clear
2:11	3	7.3	6.76	1282.	-78.4	2.44	6.210	clear
2:17	4	6.8	6.77	1229	-77.4	2.74	6.210	clear
2:22	5	6.7	6.77	1218	-74.7	2.58	6.214	clear.
2:30	6	6.8	6.87	1204	-75.1	2.54	6.214	clear. Sampled.

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes ____
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear (1) I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size: 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
Dissolved Mg	☐ Plastic	☑ Glass	1							☑ Yes	☐ No	HCl
Dissolved Zn	☐ Plastic	☐ Glass		1						☑ Yes	☐ No	HNO_3
Hardness	☐ Plastic	☑ Glass			2					☐ Yes	☑ No	Not
pH.	☐ Plastic	☐ Glass	3							☐ Yes	☑ No	Yes.
	☐ Plastic	☐ Glass								☐ Yes	☑ No	
Sodium	☐ Plastic	☐ Glass		1						☑ Yes	☑ No	HNO_3
Chloride	☐ Plastic	☐ Glass		1						☐ Yes	☑ No	No.

SCN No. 03808-05 Consumables: ☐ Waterra Tubing ____ ☐ HDPE/Teflon Tubing ____ ☑ Groundwater Filter
Field Dup. ____ ☐ Silicon Tubing ____ ☐ D.O. Ampoules ____ ☐ Footvalve

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☐ Purging/Sampling

Well No.: K19-mw16 -035

Project Name: K-19 Tntch-AK Hwy
Location: Tntch BC
Weather: Partial Sun **Temperature:** _____
GPS Coordinates: _____

Project No.: 1657709-5000
Date: 2017 - - 14-JULY ??
Completed By: AW
Reviewed By: _____

MONITORING WELL INFORMATION

Time of Measurement: 13:30
Depth to Product: NA m **Product Thickness:** _____ m
Depth to Water (A): ~~6.019~~ m below ☐ TOP
Depth to Bottom of Well (B): ~~6.099~~ m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition: OK

Tidally Influenced: ☐ Yes ☐ No
Pressurized: ☐ Yes ☐ No
Well Headspace: _____ ppm
One Well Volume:
(B-A)*2.0 = 0.15 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = _____ Litres - for a 38 mm (1.5 inch) diameter well

DRY!

EQUIPMENT LIST

Pump
☐ Waterra
☐ Hydrolift
☐ Bailer (Type: _____)
☑ Peristaltic
☐ Submersible
☐ Bladder
Pump Details: Geopump

Multimeter Model: YSI PLUMO ☐ Rental Equipment:
pH/Temp Meter Model: _____
Conductivity Meter Model: _____ ☐ Field Bump
Dissolved Oxygen Meter Model: _____ ☐ pH4 _____ ☐ pH7 _____
ORP (Redox) Meter Model: _____ ☐ pH10 _____
Organic Vapour Meter Model: _____ ☐ 1413 us/cm _____
☐ D.O. Ampoule ☐ Field Calibration _____

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X _____ = _____ litres
Avg. Flow Rate: _____ L/min.

Not enough water to sample.
Start: _____ Finish: _____
Sample Intake depth: _____

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☐ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☐ No If yes _____
Sheen: ☐ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear |||||||||||||||||||||||||||| Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. _____ Consumables: ☐ Waterra Tubing _____ ☐ HDPE/Teflon Tubing _____ ☐ Groundwater Filter
Field Dup. _____ ☐ Silicon Tubing _____ ☐ D.O. Ampoules _____ ☐ Footvalve

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☒ Purging/Sampling Well No.: KP-MW16-05

Project Name: K-19 Tntch-AK Hwy **Project No.:** 1657709-5000
Location: Tnten BC **Date:** 2017-21-July
Weather: Sunny **Temperature:** ~15°C **Completed By:** D.K Lammer
GPS Coordinates: **Reviewed By:**

MONITORING WELL INFORMATION

Time of Measurement: 12:52
Depth to Product: ___ m Product Thickness: ___ m
Depth to Water (A): 4.512 m below ☐ TOP
Depth to Bottom of Well (B): 6.524 m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: ___ ppm
One Well Volume:
(B-A)*2.0 = 4.023 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ___ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type:___) ☒ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: Geo pump

Multimeter Model: YSI Pro Plus ☐ Rental Equipment:
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Field Bump ☐ pH4 ___ ☐ pH7 ___ ☐ pH10 ___ ☐ 1413 us/cm ___
☒ Field Calibration DO, pH, Cond.

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 12.072 litres Start: 12857 Finish: 13857
Avg. Flow Rate: ~0.2 L/min. Sample intake depth: ~0.50-0.75 m bgs

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
12:58	0.2	7.5	6.38	1037	0.7	0.68	4.604	slightly cloudy, NO, NS
13:04	1.5	7.5	6.40	1001	0.1	0.91	4.605	" " " "
13:09	2.5	7.8	6.47	941	-11.3	1.26	4.650	clearing, " "
13:16	3.5	7.7	6.46	943	-17.5	1.23	4.689	" " "
13:23	5.0	8.1	6.44	967	-22.1	1.16	4.709	" " "
13:28	6.0	7.7	6.49	956	-24.3	1.10	4.715	" " "
13:33	7.0	7.3	6.40	961	-25.4	1.02	4.723	" " "
* sampling @ 13:35, parameters stable. * d.f.w following sampled							4.7402	" " "

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I X I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
L/H/P	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	Sodium bisulfate HNO3 bottles
BTEX/VPH	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	" "
dissolved/total metals	☒ Plastic	☐ Glass			2					☐ Yes	☐ No	nitric acid
D. Hg	☐ Plastic	☒ Glass	1							☒ Yes	☐ No	HCl.
F_2-F_4	☐ Plastic	☒ Glass			2					☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03816-02 Consumables: ☐ Waterra Tubing ___ ☒ HDPE/Teflon Tubing ~0.50m ☒ Groundwater Filter
Field Dup. ___ ☒ Silicon Tubing ~0.10 ☐ D.O. Ampoules ___ ☐ Footvalve

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☑ Purging/Sampling

K19 – Well No.: MW16-02D

Project Name: K-19 Tntch-AK Hwy **Project No.:** 1657709-5000
Location: Tntch BC **Date:** 2017-20-July
Weather: Overcast **Temperature:** ~15°C **Completed By:** D. Lamont
GPS Coordinates: **Reviewed By:**

MONITORING WELL INFORMATION

Time of Measurement: 14:42
Depth to Product: – 3.008 m Product Thickness: – m
Depth to Water (A): 3.993 3.990 m below ☐ TOP
Depth to Bottom of Well (B): 9.550 m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good

Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: – ppm
One Well Volume:
(B-A)*2.0 = 13.574 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type:____) ☑ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: Geopump

Multimeter Model: YSI ProPlus ☐ Rental Equipment:
pH/Temp Meter Model:
Conductivity Meter Model: ☐ Field Bump
Dissolved Oxygen Meter Model: ☐ pH4 ____ ☐ pH7 ____
ORP (Redex) Meter Model: ✓ ☐ pH10 ____
Organic Vapour Meter Model: – ☐ 1413 us/cm ____
☐ D.O. Ampoule ☑ Field Calibration DO, pH 7, 4/10, Cond.

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 40.722 litres Start: 14:50 Finish: 15:54
Avg. Flow Rate: 200 mL/min. Sample intake depth: 0.5m - 0.75m above bottom

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
14:53	0.3	5.9	7.17	648.1	-26.2	0.48	3.221	clear, NO NS
14:58	1.3	5.7	7.11	654.9	-31.1	0.31	3.253	" " "
15:03	2.3	5.9	7.12	667.0	-32.3	0.21	3.277	" " "
15:08	3.3	5.9	7.11	672.2	-35.8	0.26	3.295	" " "
15:13	4.3	5.8	7.11	676.2	-38.2	0.25	3.320	" " "
15:18	5.3	5.8	7.11	672.5	-39.7	0.28	3.341	" " "
* Sampling w/ peristaltic @ 15:20								
* Finish sampling at 15:54							3.425	

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes ____
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear |||||||||||||||||||||||||||||||||||| Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
Nitrate	☐ Plastic	☑ Glass	3x2							☐ Yes	☑ No	sodium hydroxide
TMP	☐ Plastic	☑ Glass			2x2					☐ Yes	☑ No	" "
T-P	☐ Plastic	☑ Glass			2x2					☐ Yes	☑ No	none
Bacteriological	☑ Plastic	☐ Glass		2x2						☑ Yes	☐ No	nitric acid
Dissolved Hg	☐ Plastic	☑ Glass	1x2							☑ Yes	☐ No	HCl
chloride	☐ Plastic	☐ Glass		1x2						☐ Yes	☑ No	none
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03815-03
Field Dup. 03815-04

Consumables: ☐ Waterra Tubing ____ ☐ HDPE/Teflon Tubing 1 ☑ Groundwater Filter
☑ Silicon Tubing ~0.10m ☐ D.O. Ampoules ____ ☐ Footvalve

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☒ Purging/Sampling

Well No.: K19-MW16-07S

Project Name: K-19 Tetch-AK Hwy
Location: Tetch BC
Weather: Sunny w/c louds Temperature: ~10-15°C
GPS Coordinates:
Project No.: 1657709-5000
Date: 2017-25-~~July~~, July 26
Completed By: DK
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 12:00
Depth to Product: – m
Product Thickness: – m
Depth to Water (A): 3.235 m below ☒ TOP
Depth to Bottom of Well (B): 4.365 m below ☒ TOP
Diameter of Standpipe: 51 mm
Well Condition: *Compromised; hit w/ excavator *appears intact
Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: – ppm
One Well Volume:
(B-A)*2.0 = 2.26 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump
☐ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☒ Peristaltic
☐ Submersible
☐ Bladder

Pump Details: Geopump

Multimeter Model: YSI Pro Plus
pH/Temp Meter Model: |
Conductivity Meter Model: |
Dissolved Oxygen Meter Model: |
ORP (Redox) Meter Model: ↓
Organic Vapour Meter Model: –
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4
☐ pH7
☐ pH10
☐ 1413 us/cm
☒ Field Calibration 7, 4, 10, DO, 1413

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 6.78 litres
Avg. Flow Rate: 200 mL/min L/min.
Start: July 25 12:06
Finish: July 26 16:40
Sample intake depth: 0.1 to 0.5 m above bottom

Date	Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
	12:10	0.5	7.9	6.83	823	9.7	1.93	3.460	clear, NO, NS
	12:15	1.5	9.1	6.84	830	18.2	2.56	3.720	" " "
	12:20	2	8.9	6.76	807	21.5	1.25	3.893	*lowered flow rate
	12:25	2.5	9.8	6.78	833	18.4	2.13	4.059	*drawing down
	12:38	3.75	7.4	6.79	882	15.5	0.60	4.301	*well dry; return tomorrow to sample
July 26	16:20*	purged dry yesterday → purge tubing then sample						3.703	*drew down well
	16:40*	sampling completed → collect set of parameters						4.100	sampling → had to lower tubing
	16:41	–	13.1	6.79	661	27.3	6.86	4.100	

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear [✓ I] I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
BTEX/VPH	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	sodium bisulfite
L/HEPH/PAH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	" "
Chloride	☒ Plastic	☐ Glass		1						☐ Yes	☒ No	none
d.metals	☒ Plastic	☐ Glass		1						☒ Yes	☐ No	HNO_3
d.Hg	☐ Plastic	☒ Glass	1							☒ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

*8 containers

SCN No. 03797-07
Field Dup. –
Consumables: ☐ Waterra Tubing ☒ Silicon Tubing ~0.10 m ☐ HDPE/Teflon Tubing ☐ D.O. Ampoules ☒ Groundwater Filter ☐ Footvalve

13-JULY-2017.

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☑ Purging/Sampling

Well No.: K19-MW6 [redacted] -100

Project Name: K-19 Trutch-AK Hwy
Location: Trutch BC
Weather: overcast. Temperature:
GPS Coordinates:

Project No.: 1657709-5000
Date: 2017-07-13
Completed By: AW/MZ.
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 9:25
Depth to Product: NA ~~2.653~~ m
Product Thickness: m
Depth to Water (A): 3.653 m below ☑ TOP
Depth to Bottom of Well (B): 12.86 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: OK

Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 18.4 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☑ Peristaltic
☐ Submersible
☐ Bladder

Pump Details: Geopump

Multimeter Model: YSI ProDS.
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redox) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ☐ pH7
☐ pH10
☐ 1413 us/cm
☐ Field Calibration

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 55 litres
Avg. Flow Rate: ~~[illegible]~~ 0.2 L/min.
Start: 9:30am. Finish: 11:00am
Sample intake depth:

ite

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
9:47	1	6.3	7.27	710	2.4	1.85	3.779	Clear.
9:55	2	5.4	7.05	~~[illegible]~~ 626.4	-13.1	1.60	3.859	Clear
10:05	4	5.1	7.09	640.7	-17.1	1.37	3.908	Clear.
10:18	6	5.4	7.08	630.9	-16.7	1.76	3.883	Clear.
10:31	8	5.2	7.07	658.8.	-15.2	1.42	3.906	Clear Sampled.

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear IIIIIIIIIIIIIIIIIIIIIIIIIIIIIII Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
Dissolved metal	☑ Plastic	☐ Glass		1						☑ Yes	☐ No	Yes
Dissolved Hg	☐ Plastic	☑ Glass	1							☑ Yes	☐ No	Yes
VPH	☐ Plastic	☑ Glass	3							☑ Yes	☑ No	Yes
LEPH/HEPH	☐ Plastic	☑ Glass			2					☑ Yes	☑ No	Yes
Chloride	☑ Plastic	☐ Glass		1						☐ Yes	☑ No	No
Glycol	☐ Plastic	☑ Glass	3							☐ Yes	☑ No	Yes
Sodium.	☑ Plastic	☐ Glass		1						☑ Yes	☐ No	Nitric

SCN No. 03808-01
Field Dup.

Consumables: ☑ Waterra Tubing ☑ Silicon Tubing ☑ HDPE/Teflon Tubing ☐ D.O. Ampoules ☑ Groundwater Filter ☐ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☑ Purging/Sampling

Well No.: K19-MW16-[illegible] -10a

Project Name:	K-19 Tritch-AK Hwy	**Project No.:**	1657709-5000
Location:	Triten BC	**Date:**	2017-07-13
Weather:	overcast, **Temperature:**	**Completed By:**	AW
GPS Coordinates:		**Reviewed By:**	

MONITORING WELL INFORMATION

Time of Measurement: 11:00 am
Depth to Product: — m Product Thickness: ____ m
Depth to Water (A): 3.488 m below ☐ TOP
Depth to Bottom of Well (B): 6.423 m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition: OK

Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 6 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra
☐ Hydrolift
☐ Bailer (Type: ____)
☑ Peristaltic
☐ Submersible
☐ Bladder

Pump Details: Geopump

Multimeter Model: YSI ProPlus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redox) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ____ ☐ pH7 ____
☐ pH10 ____
☐ 1413 us/cm ____
☐ Field Calibration ____

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 18 litres
Avg. Flow Rate: ~ 0.2 L/min.
Start: ____ Finish: ____
Sample intake depth: ____

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. (µS/cm) or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
11:33	1	6.4	7.04	676.3	-40.7	1.76	4.101	Clear
11:42	2	6.8	6.74	598.1	-27.5	2.26	4.491	Clear.
11:50	3	6.4	6.73	577.9	-27.5	2.10	4.433	Clear
12:00	4.5	6.4	6.78	563.[illegible]	-29.7	2.93	5.253	Clear.
12:10.	6	6.4	6.68	547.2	-30.8	2.27	5.739	Clear.
12:20.	7	9.3	6.76	578.7	-43.7	4.83	6.073	some seds.
12:30	8	5.6	6.72	536.9	-43.1	[illegible]	6.271	
4:30		4.4	6.69	405.7	-12.9	7.05	4.768	—DRY!

* Record DO in Mg/L, not percentage

came back and sampled at 4:30 Going to let recharge + then sample later.

Comments:
Odour: ☐ Yes ☑ No If yes ____
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
Dissolved metals	☐ Plastic	☐ Glass		1						☐ Yes	☐ No	Yes HNO3
Dissolved Hg	☐ Plastic	☐ Glass	1							☐ Yes	☐ No	Yes. HCl
VPH	☐ Plastic	☐ Glass	3							☐ Yes	☐ No	Yes
LEPH.	☐ Plastic	☐ Glass			2					☐ Yes	☐ No	Yes
Glycol	☐ Plastic	☐ Glass	3							☐ Yes	☐ No	Yes
Chloride.	☐ Plastic	☐ Glass		1						☐ Yes	☐ No	Yes.
Sodium	☐ Plastic	☐ Glass		1						☐ Yes	☐ No	

SCN No. 03808-02 Consumables: ☐ Waterra Tubing ____ ☑ HDPE/Teflon Tubing ____ ☑ Groundwater Filter
Field Dup. ____ ☑ Silicon Tubing ____ ☐ D.O. Ampoules ____ ☐ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☑ Purging/Sampling

Well No.: K19 - MW16-[redacted] -12D

Project Name: K-19 Trutch-AK Hwy
Project No.: 1657709-5000
Location: Trutch BC
Date: 2017-07-13
Weather: Overcast.
Temperature:
Completed By: AW
GPS Coordinates:
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 13:05
Depth to Product: — m
Product Thickness: ____ m
Depth to Water (A): 2.703 m below ☐ TOP
Depth to Bottom of Well (B): 8.659 m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition: OK
Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: — ppm
One Well Volume: 11.9L
(B-A)*2.0 = [redacted] Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump
☐ Waterra
☐ Hydrolift
☐ Bailer (Type: ____)
☑ Peristaltic
☐ Submersible
☐ Bladder

Pump Details: Geo pump.

Multimeter Model: YSI Pro Plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redox) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Rental Equipment
☐ Field Bump
☐ pH4 ____ ☐ pH7 ____
☐ pH10 ____
☐ 1413 us/cm ____
☐ Field Calibration ____

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 35 litres
Start: 115
Finish: 2:00
Avg. Flow Rate: ≈ 0.2 L/min.
Sample intake depth:

ite

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☐ Specific Cond. (µS/cm or mS/cm) (circle one)	ORP Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
1:17	1	5.3	6.65	348.6	-51.6	2.74	2.758	Clear.
1:30	3	5.6	6.59	336.8	-47.1	2.68	2.749	Clear.
1:37	4	5.5	6.68	335.1	-40.1	1.89	2.758	Clear.
1:45	6	5.9	6.59	328.6	-42.2	2.81	2.764	Clear
2:00	8	5.8	6.61	333.2	-22.4	2.12	2.769	Clear Sampled

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear IIIIIIIIIIIIIIIIIIIIIIIIIIIIIII Very Silty

Analysis	Type		40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
			Container Size									
Dissolved met	☑ Plastic	☐ Glass		1						☑ Yes	☐ No	Yes HNO3
Diss Hg	☐ Plastic	☑ Glass	1							☑ Yes	☐ No	Yes HCl
VPH	☐ Plastic	☑ Glass	3							☐ Yes	☑ No	Yes
LEPH	☐ Plastic	☑ Glass			2					☐ Yes	☑ No	Yes.
Glycol	☐ Plastic	☑ Glass	3							☐ Yes	☑ No	Yes.
Chloride	☑ Plastic	☐ Glass		1						☐ Yes	☑ No	Yes
Sodium	☑ Plastic	☐ Glass		1						☐ Yes	☑ No	

SCN No. 03808-03
Field Dup. ____
Consumables: ☐ Waterra Tubing ____ ☑ HDPE/Teflon Tubing ____ ☑ Groundwater Filter
☑ Silicon Tubing ____ ☐ D.O. Ampoules ____ ☐ Footvalve

15-JULY-2017

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☑ Purging/Sampling Well No. K19-mw16-14

Project Name: K-19 Tritech-AK Hwy **Project No.:** 1657709-5000
Location: Tritech BC **Date:** 2017-07-15
Weather: Blue Sky **Temperature:** ____ **Completed By:** AW
GPS Coordinates: ____ **Reviewed By:** ____

MONITORING WELL INFORMATION

Time of Measurement: 9:20am
Depth to Product: — m Product Thickness: — m
Depth to Water (A): 6.67 m below ☐ TOP
Depth to Bottom of Well (B): 8.745 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: OK

Tidally Influenced: ☐ Yes ☐ No
Pressurized: ☐ Yes ☐ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 4.2 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type: ____) ☑ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: ____

Multimeter Model: YSI PC MU
pH/Temp Meter Model: ____
Conductivity Meter Model: ____
Dissolved Oxygen Meter Model: ____
ORP (Redex) Meter Model: ____
Organic Vapour Meter Model: ____
☐ D.O. Ampoule

☐ Rental Equipment:
☑ Field Bump ☐ pH4 ____ ☐ pH7 ____ ☑ pH10 ____ ☐ 1413 us/cm ____
☑ Field Calibration AW

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 12.6 litres Start: 9:30 Finish: 10:40
Avg. Flow Rate: 0.2 L/min. Sample intake depth: ____

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
9:30	1	7.3	6.23	1779	-28.2	3.04	6.748	Clear
9:35	2	6.9	6.26	1724	-31.0	2.67	6.794	Clear
9:45	3	7.3	6.25	1712	-31.0	3.11	6.784	Clear
9:50	4	7.1	6.25	1644	-16.5	2.61	6.792	Clear.
9:56	5	7.3	6.24	1683	-17.0	3.09	6.799	Clear.
10:06	6	7.2	6.32	1679	-20.2	2.86	6.807	Clear
10:13	7	7.1	6.35	1660	-19.4	3.14	6.816	Clear — Sampled!

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes ____
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear (1) 2 3 4 5 6 7 8 9 10 Very Silty

Analysis	Type		Container Size: 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
Diss Hg	☐ Plastic	☑ Glass	1							☑ Yes	☐ No	HCl
Diss Metals	☐ Plastic	☐ Glass		1						☑ Yes	☐ No	HNO3
VPH	☐ Plastic	☑ Glass	3							☐ Yes	☑ No	✓
LEPH/HEPH	☐ Plastic	☑ Glass			2					☐ Yes	☑ No	✓
VOC	☐ Plastic	☑ Glass	3							☐ Yes	☑ No	✓
Chloride	☑ Plastic	☐ Glass		1						☐ Yes	☑ No	X
Sulfur	☑ Plastic	☐ Glass		1						☐ Yes	☑ No	HNO3

SCN No. 023809-01 Consumables: ☐ Waterra Tubing ____ ☑ HDPE/Teflon Tubing ____ ☑ Groundwater Filter
Field Dup. ____ ☐ Silicon Tubing ____ ☐ D.O. Ampoules ____ ☐ Footvalve

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☑ Purging/Sampling Well No. K19-MW7-OLD

Project Name: K-19 Tntch-AK Hwy **Project No.:** 1657709-5000
Location: Tntch BC **Date:** 2017-07-15
Weather: SUNNY **Temperature:** 14C **Completed By:** AW
GPS Coordinates: **Reviewed By:**

MONITORING WELL INFORMATION

Time of Measurement: 11:15
Depth to Product: — m Product Thickness: — m
Depth to Water (A): 7.231 m below ☐ TOP
Depth to Bottom of Well (B): 9.959 m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition: OK (Rethy new!)

Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: — ppm
One Well Volume: 2.4
(B-A)*2.0 = 5.2 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type:____) ☑ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: Geo pump

Multimeter Model: YSI 80 PSD ☐ Rental Equipment:
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Field Bump
☑ pH4 ____ ☐ pH7 ____
☐ pH10 ____
☐ 1413 us/cm ____
☑ Field Calibration ____

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 15.6 litres Start: 11:15 Finish:
Avg. Flow Rate: 0.1 - 0.2 L/min. Sample intake depth:

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
11:18	1	10.9	6.30	1450	-23.6	3.22	7.553	Clear.
11:26	2	9.6	6.32	1378	-26.9	3.06	7.744	Clear.
11:35	3	8.8	6.33	1373	-29.4	3.73	7.942	Clear.
11:40	35	8.7	6.36	1364	-22.2	3.57	8.038	Clear.
11:50	45	9.4	6.33	1363	-19.4	3.09	8.124	Clear.
12:00	5	9.6	6.33	1351	-19.3	3.59	8.210	Clear.
12:	7	9.8	6.35	1372	-19.0	3.34	8.210	Sampled.

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear (1) ..... Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
Sulphur	☑ Plastic	☐ Glass		1						☐ Yes	☑ No	
Diss mercury	☐ Plastic	☑ Glass	1							☑ Yes	☐ No	HCl
Diss metals	☑ Plastic	☐ Glass		1						☑ Yes	☐ No	HNO_3
PAH	☐ Plastic	☑ Glass			2					☐ Yes	☑ No	
VOC/VPH	☐ Plastic	☑ Glass	3							☐ Yes	☑ No	
Glycol	☐ Plastic	☑ Glass	3							☐ Yes	☑ No	

SCN No. 03809-01 Consumables: ☐ Waterra Tubing ____ ☐ HDPE/Teflon Tubing ____ ☑ Groundwater Filter
Field Dup. ____ ☐ Silicon Tubing ____ ☐ D.O. Ampoules ____ ☐ Footvalve

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☑ Purging/Sampling Well No.: K19-mw17-015

Project Name: K-19 Triten-AK Hwy
Location: Triten BC
Weather: Sunny **Temperature:** ____
GPS Coordinates: ____
Project No.: 1657709-5000
Date: 2017-07-15
Completed By: AW
Reviewed By: ____

MONITORING WELL INFORMATION

Time of Measurement: 1100
Depth to Product: ____ m Product Thickness: ____ m
Depth to Water (A): 4.931 m below ☑ TOP
Depth to Bottom of Well (B): 5.780 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good (Growish)

Tidally Influenced: ☐ Yes ☐ No
Pressurized: ☐ Yes ☐ No
Well Headspace: ____ ppm
One Well Volume: 0.5
(B-A)*2.0 = 1.9 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type: ____) ☑ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: Geo pump

Multimeter Model: YSI ProPlus ☐ Rental Equipment
pH/Temp Meter Model: ____
Conductivity Meter Model: ____
Dissolved Oxygen Meter Model: ____
ORP (Redex) Meter Model: ____
Organic Vapour Meter Model: ____
☐ D.O. Ampoule

☐ Field Bump ☑ pH4 ____ ☑ pH7 ____ ☐ pH10 ____ ☐ 1413 us/cm ____
☑ Field Calibration AW

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 5.4 litres
Avg. Flow Rate: ~0.2 L/min.
Start: 12:57 Finish: ____
Sample intake depth: ____

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
1:04	2	7.0	6.37	2331	-50.8	3.61	5.130	Clear
1:10	3	6.4	6.40	2591	-61.5	3.65	5.210	Clear
1:16	4	6.2	6.45	2881	-77.1	4.03	5.339	Clear
1:22	5	6.6	6.47	2961	-92.0	4.40	5.429	Sheen
1:26	5.5	6.6	6.49	2931	-96.0	5.14	5.489	Sheen
1:30	6	6.8	6.48	2863	-86.4	6.44	5.524	Sheen
								DRY

* Record DO in Mg/L, not percentage

Back tomorrow to sample.
* NOT developed yet as only had enough water

Comments:
Odour: ☑ Yes ☐ No If yes small Hydrocarbon odor.
Sheen: ☑ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like Potentially Both?
Turbidity: Clear Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. ____ Consumables: ☐ Waterra Tubing ____ ☐ HDPE/Teflon Tubing ____ ☐ Groundwater Filter
Field Dup. ____ ☐ Silicon Tubing ____ ☐ D.O. Ampoules ____ ☐ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☐ Purging/Sampling

Well No.: K19-MW17-05

Project Name: K-19 Tritch-AK Hwy
Location: Tritch BC
Weather: ______ **Temperature:** ______
GPS Coordinates: ______
Project No.: 1657709-5000
Date: 2017 - -
Completed By: ______
Reviewed By: ______

MONITORING WELL INFORMATION

Time of Measurement: ______
Depth to Product: ______ m
Product Thickness: ______ m
Depth to Water (A): ______ m below ☐ TOP
Depth to Bottom of Well (B): ______ m below ☐ TOP
Diameter of Standpipe: ______ mm
Well Condition: ______
Tidally Influenced: ☐ Yes ☐ No
Pressurized: ☐ Yes ☐ No
Well Headspace: ______ ppm
One Well Volume:
(B-A)*2.0 = ______ Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ______ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra
☐ Hydrolift
☐ Bailer (Type: ______)
☐ Peristaltic
☐ Submersible
☐ Bladder
Pump Details: ______
Multimeter Model: ______
pH/Temp Meter Model: ______
Conductivity Meter Model: ______
Dissolved Oxygen Meter Model: ______
ORP (Redex) Meter Model: ______
Organic Vapour Meter Model: ______
☐ D.O. Ampoule
☐ Rental Equipment:
☐ Field Bump
☐ pH4 ______ ☐ pH7 ______
☐ pH10 ______
☐ 1413 us/cm ______
☐ Field Calibration ______

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X ______ = ______ litres
Start: ______ Finish: ______
Avg. Flow Rate: ______ L/min.
Sample intake depth: ______

Date	Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
July 21	14:26	→ resume	purging					4.232	
	14:30	(2L)	9.9	6.45	1402	-74.0	1.49	4.983	oily sheen, HC-like odour
	*Pumped dry after 13L; well has been pumped dry 8 times and can be sampled								

* Record DO in Mg/L, not percentage

Comments:
Odour: ☒ Yes ☐ No If yes HC-like
Sheen: ☒ Yes ☐ No If yes ☒ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. ______
Field Dup. ______
Consumables: ☐ Waterra Tubing ______ ☐ HDPE/Teflon Tubing ______ ☐ Groundwater Filter
☐ Silicon Tubing ______ ☐ D.O. Ampoules ______ ☐ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☑ Purging/Sampling Well No.: ~~K19-~~ MW 17-02

Project Name: K-19 Tntch-AK Hwy
Location: Tntch BC
Weather: Cloudy/Raining Temperature: ____
GPS Coordinates: ____

Project No.: 1657709-5000
Date: 2017-07-15
Completed By: AW
Reviewed By: ____

MONITORING WELL INFORMATION

Time of Measurement: 15:45
Depth to Product: ____ m Product Thickness: ____ m
Depth to Water (A): 6.01 m below ☑TOP
Depth to Bottom of Well (B): 4.71 m below ☑TOP
Diameter of Standpipe: 51 mm
Well Condition: OK

Tidally Influenced: ☐ Yes ☑No
Pressurized: ☐ Yes ☑No
Well Headspace: ____ ppm
One Well Volume:
(B-A)*2.0 = 7.2 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type: ____) ☑ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: Geo pump ☐ D.O. Ampoule

Multimeter Model: YSI ProPlus ☐ Rental Equipment:
pH/Temp Meter Model: ____
Conductivity Meter Model: ____
Dissolved Oxygen Meter Model: ____
ORP (Redex) Meter Model: ____
Organic Vapour Meter Model: ____

☑ Field Bump ☐ pH4 ____ ☐ pH7 ____ ☐ pH10 ____ ☐ 1413 us/cm ____
☑ Field Calibration AW

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 21.6 litres Start: 15:50 Finish: 16:45
Avg. Flow Rate: 0.25 L/min. Sample intake depth: ____

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. (µS/cm or mS/cm) (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
15:55	1	5.6	6.56	1421	-32.9	2.74	6.178	
16:03	3	5.6	6.52	1370	-35.6	3.06	6.181	
16:07	4	5.5	6.49	1343	-36.5	3.30	6.194	
16:12	5	5.8	6.46	1330	-35.9	3.42	6.179	
16:19	6	5.8	6.44	1292	-35.0	3.50	6.183	
16:25	7	5.8	6.42	1281	-35.1	3.67	6.191	Sampled

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑No If yes ____
Sheen: ☐ Yes ☑No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear (1) 2 3 4 5 6 7 8 9 10 Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
D&S Hg	☐ Plastic	☑Glass	1							☑Yes	☐ No	HCl
Dissolved Metals	☑Plastic	☐ Glass		1						☑Yes	☐ No	HNO_3
VOC/BTEX/F1	☐ Plastic	☑Glass	3							☐ Yes	☑No	✓
PAH	☐ Plastic	☑Glass			2					☐ Yes	☑No	✓
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03809-04 Consumables: ☐ Waterra Tubing ____ ☑HDPE/Teflon Tubing ____ ☑Groundwater Filter
Field Dup. ____ ☐ Silicon Tubing ____ ☐ D.O. Ampoules ____ ☐ Footvalve

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☒ Purging/Sampling

Well No.: N4-MW17-04

Project Name: K-19 Tretch-AK Hwy
Location: Tretch BC
Weather: ______ **Temperature:** ______
GPS Coordinates: ______
Project No.: 1657709-5000
Date: 2017 - -
Completed By: ______
Reviewed By: ______

MONITORING WELL INFORMATION

Time of Measurement: ______
Depth to Product: — m
Product Thickness: — m
Depth to Water (A): 4.249 m below ☒ TOP
Depth to Bottom of Well (B): 8.056 m below ☒ TOP
Diameter of Standpipe: 51 mm
Well Condition: ______
Tidally Influenced: ☐ Yes ☐ No
Pressurized: ☐ Yes ☐ No
Well Headspace: ______ ppm
One Well Volume:
(B-A)*2.0 = 7.6 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ______ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra
☐ Hydrolift
☐ Bailer (Type: ______)
☒ Peristaltic
☐ Submersible
☐ Bladder

Pump Details: Geo pump

Multimeter Model: ______
pH/Temp Meter Model: ______
Conductivity Meter Model: ______
Dissolved Oxygen Meter Model: ______
ORP (Redex) Meter Model: ______
Organic Vapour Meter Model: ______
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ______ ☐ pH7 ______
☐ pH10 ______
☐ 1413 us/cm ______
☐ Field Calibration ______

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 22.8 litres
Start: 14:17 Finish: ______
Avg. Flow Rate: ______ L/min.
Sample intake depth: ______

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
14:25	2	7.5	6.75	617.1	32.1	2.37	4.981	
14:32	3	8.2	6.75	604.2	31.0	2.63	5.211	
1438	4	8.2	6.77	600.7	30.3	2.88	5.554	
14:47	5	7.9	6.80	602.8	28.3	2.82	6.054	
14:51	6	8.1	6.80	601.3	[illegible]	2.86	6.298	
14:59	7	8.0	6.80	603.3	27.1	2.91	6.511	→ increased flowrate to purge!

* Record DO in Mg/L, not percentage

Total volume purged ≃ 17L – come back to sample

Comments:
Odour: ☐ Yes ☒ No If yes ______
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear [✓ I I] I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
			Container Size									
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. ______
Field Dup. ______
Consumables: ☐ Waterra Tubing ______ ☐ HDPE/Teflon Tubing ______ ☐ Groundwater Filter
☐ Silicon Tubing ______ ☐ D.O. Ampoules ______ ☐ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☐ Purging/Sampling

Well No.: K19-MW704

Project Name: K-19 Tritch-AK Hwy
Location: Tritch BC
Weather: _____ **Temperature:** _____
GPS Coordinates: _____

Project No.: 1657709-5000
Date: 2017 - -
Completed By: _____
Reviewed By: _____

MONITORING WELL INFORMATION

Time of Measurement: _____
Depth to Product: _____ m Product Thickness: _____ m
Depth to Water (A): _____ m below ☐ TOP
Depth to Bottom of Well (B): _____ m below ☐ TOP
Diameter of Standpipe: _____ mm
Well Condition: _____

Tidally Influenced: ☐ Yes ☐ No
Pressurized: ☐ Yes ☐ No
Well Headspace: _____ ppm
One Well Volume:
(B-A)*2.0 = _____ Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = _____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra
☐ Hydrolift
☐ Bailer (Type: _____)
☒ Peristaltic
☐ Submersible
☐ Bladder

Pump Details: Geopump

Multimeter Model: YSI ProPlus ☐ Rental Equipment:
pH/Temp Meter Model: _____
Conductivity Meter Model: _____ ☐ Field Bump
Dissolved Oxygen Meter Model: _____ ☐ pH4 _____ ☐ pH7 _____
ORP (Redex) Meter Model: _____ ☐ pH10 _____
Organic Vapour Meter Model: _____ ☐ 1413 us/cm _____

☐ D.O. Ampoule
☒ Field Calibration DO 7, 4, 10, 1413

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X _____ = _____ litres
Avg. Flow Rate: 100 mL/min 0 L/min.

Start: _____ Finish: 11:40 July 25/2017
Sample intake depth: 0.25-0.50 m above bottom

Date July 25

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
11:09	*	not enough volume for full sample; start w/ VOCs, collected as much as possible					7.457	
11:17	*	purge tubing and sample @ very low flow						
11:40	-	8.5	6.96	6.14	138	6.17	7.685	* post sample
* Well did not recharge over past 4 days; sampled immediately at very low flow; recorded parameters after sample								

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes _____
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear |X| Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
BTEX/VPH/NOC	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	sodium bisulfate
LH/PAH	☐ Plastic	☒ Glass			2	2				☐ Yes	☒ No	" "
F2-F4	☐ Plastic	☒ Glass			2	2				☐ Yes	☒ No	none
Phenols	☒ Plastic	☐ Glass		1						☒ Yes	☐ No	HNO3
D.Mg	☐ Plastic	☒ Glass	1							☒ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03765-02 Consumables: ☐ Waterra Tubing _____ ☐ HDPE/Teflon Tubing _____ ☒ Groundwater Filter
Field Dup. _____ ☒ Silicon Tubing 0.05m ☐ D.O. Ampoules _____ ☐ Footvalve

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☑ Purging/Sampling

Well No.: KI9 MW17-05

Project Name: KI9 FIELD Investigation ~~1657709/5000~~
Location: Tatch BC
Weather: Sunny   Temperature:
GPS Coordinates:

Project No.: 1657709/5000
Date: July 20/17
Completed By: AW
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 4:15
Depth to Product: — m   Product Thickness: — m
Depth to Water (A): 4.04 m below ☑ TOP
Depth to Bottom of Well (B): 9.44 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good!

Tidally Influenced: ☐ Yes ☐ No
Pressurized: ☐ Yes ☐ No
Well Headspace: ______ ppm
One Well Volume:
(B-A)*2.0 = 10 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ______ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra
☐ Hydrolift
☐ Bailer (Type: ______)
☑ Peristaltic
☐ Submersible
☐ Bladder
Pump Details: Geopump

Multimeter Model: YSI ProPlus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ______ ☐ pH7 ______
☐ pH10 ______
☐ 1413 us/cm ______
☑ Field Calibration ______

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 30 litres
Avg. Flow Rate: 0.2 L/min.
Start: July 20 4:20   Finish: July 27
Sample intake depth:

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	Water Level (m)	Remarks
16:28	1	6.4	6.27	3399	-4.3	9.05	4.741	
16:33	2	6.3	5.74	3437	33.0	9.89	4.879	
16:39	3	6.6	5.68	3380	39.5	10.07	5.114	
16:44	3.5	6.5	5.67	3392	42.1	10.35	5.311	
16:49	4	5.6	5.66	3374	45.0	11.43	5.489	
16:54	5	6.4	5.66	3381	45.1	11.99	5.751	
17:00	6	5.8	5.68	3389	42.7	11.65	6.049	
17:05	6.5	5.6	5.71	3433	38.0	11.65	6.130	} not stable
17:10	7	5.7	5.72	3411	35.7	11.31	6.261	→ purge & sample tomorrow

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes ______
Sheen: ☑ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☑ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. ______
Field Dup. ______

Consumables: ☐ Waterra Tubing ______ ☐ HDPE/Teflon Tubing ______ ☐ Groundwater Filter
☐ Silicon Tubing ______ ☐ D.O. Ampoules ______ ☐ Footvalve

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GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☒ Purging/Sampling

Well No.: K19-MW17-05

Project Name: K-19 Trutch-AK Hwy
Location: Trutch BC
Weather: Sunny
Temperature: ~15°C
GPS Coordinates:
Project No.: 1657709-5000
Date: 2017-21-17
Completed By: D Klammer
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: ______
Depth to Product: ______ m
Product Thickness: ______ m
Depth to Water (A): ______ m below ☐ TOP
Depth to Bottom of Well (B): ______ m below ☐ TOP
Diameter of Standpipe: ______ mm
Well Condition: ______
Tidally Influenced: ☐ Yes ☐ No
Pressurized: ☐ Yes ☐ No
Well Headspace: ______ ppm
One Well Volume:
(B-A)*2.0 = ______ Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ______ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump
☐ Waterra
☐ Hydrolift
☐ Bailer (Type:______)
☒ Peristaltic
☐ Submersible
☐ Bladder

Pump Details: Geopump

Multimeter Model: ______
pH/Temp Meter Model: ______
Conductivity Meter Model: ______
Dissolved Oxygen Meter Model: ______
ORP (Redox) Meter Model: ______
Organic Vapour Meter Model: ______
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ______ ☐ pH7 ______
☐ pH10 ______
☐ 1413 us/cm ______
☐ Field Calibration ______

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X ______ = ______ litres
Start: ______ Finish: ______
Avg. Flow Rate: ______ L/min.
Sample intake depth: ______

Date
July 21

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. [✓ µS/cm] or mS/cm *(circle one)*	Redox (mV)	Diss. O$_2$* (mg/L)	DTW Water Level (m)	Remarks
drew out ~8L between 0884 and 9:02 w/ peristaltic, trying to stabilize H2O level; initial lev								
09:11	16 (incl. yesterday)						6.802	3,866m
09:18	17.5 (10.5)	7.2	5.86	3191	73	2.67	7.125	clear, NO, NS
09:23	18.5 (11.5)	7.0	5.92	3014	3.4	3.88	7.258	" " "
* Pump depth marked on; allow to recover and then sample this afternoon or tomorrow								" " "

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☐ No If yes ______
Sheen: ☐ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. ______
Field Dup. ______
Consumables: ☐ Waterra Tubing ______ ☐ Silicon Tubing ______ ☐ HDPE/Teflon Tubing ______ ☐ D.O. Ampoules ______ ☐ Groundwater Filter ☐ Footvalve

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GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☒ Purging/Sampling

Well No.: K19-MW17-05

Project Name: K-19 Tritch-AK Hwy
Location: Triten BC
Weather: _____ **Temperature:** _____
GPS Coordinates: _____

Project No.: 1657709-5000
Date: 2017 - -
Completed By: _____
Reviewed By: _____

MONITORING WELL INFORMATION

Time of Measurement: _____
Depth to Product: _____ m Product Thickness: _____ m
Depth to Water (A): _____ m below ☐ TOP
Depth to Bottom of Well (B): _____ m below ☐ TOP
Diameter of Standpipe: _____ mm
Well Condition: _____

Tidally Influenced: ☐ Yes ☐ No
Pressurized: ☐ Yes ☐ No
Well Headspace: _____ ppm
One Well Volume:
(B-A)*2.0 = _____ Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = _____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type: _____) ☐ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: _____

Multimeter Model: _____ ☐ Rental Equipment:
pH/Temp Meter Model: _____
Conductivity Meter Model: _____ ☐ Field Bump
Dissolved Oxygen Meter Model: _____ ☐ pH4 _____ ☐ pH7 _____
ORP (Redex) Meter Model: _____ ☐ pH10 _____
Organic Vapour Meter Model: _____ ☐ 1413 us/cm _____
☐ D.O. Ampoule ☐ Field Calibration _____

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X _____ = _____ litres
Avg. Flow Rate: _____ L/min.
Start: _____ Finish: 09:21 - July 27, 2017
Sample intake depth: _____

Date: July 27/2017

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☐ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
08:54						→	3.568m	
* purged dry	previously	& sample	immediately	collect	parameters	before	& after	
09:07	tubing	7.4	6.46	3623	-50.1	3.17	3.699	clear, NO N/S
* sampling @	09:10	& complete	@ 09:21	→	→	→	4.524	" " "
09:21	V	7.0	5.75	3489	18.6	4.28	4.524	" " "

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes _____
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear |X| Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
BTEX/VPH/HM	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	sodium bisulfate * 10 bottles
L/H/PAH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	" "
Fe-Fe chloride	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	none
d. metals	☒ Plastic	☐ Glass		1						☐ Yes	☒ No	none
d. Hg	☒ Plastic	☐ Glass		1						☒ Yes	☐ No	HNO_3
	☐ Plastic	☒ Glass	1							☒ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03798-01
Field Dup. _____
Consumables: ☐ Waterra Tubing _____ ☒ HDPE/Teflon Tubing ~0.25m ☒ Groundwater Filter
☒ Silicon Tubing ~0.10 ☐ D.O. Ampoules _____ ☐ Footvalve

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☑ Purging/Sampling

Well No.: K19 MW17-06

Project Name: K-19 Tritch-AK Hwy
Location: Tritch BC
Weather: Rainy Thunderstorm / **Temperature:**
GPS Coordinates:

Project No.: 1657709-5000
Date: 2017-20-2017
Completed By: AW
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 14:15
Depth to Product: — m Product Thickness: — m
Depth to Water (A): 8.185 m below ☐ TOP
Depth to Bottom of Well (B): 12.480 m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good

Tidally Influenced: ☐ Yes ☐ No
Pressurized: ☐ Yes ☐ No
Well Headspace: ppm
One Well Volume:
(B-A)*2.0 = 12.6 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump
☐ Waterra
☐ Hydrolift
☑ Bailer (Type: Teflon)
☐ Peristaltic
☐ Submersible
☐ Bladder
Pump Details: Grapump

Multimeter Model: YSI ProPlus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ☐ pH7
☐ pH10
☐ 1413 us/cm
☐ Field Calibration PK

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 38.6 litres
Avg. Flow Rate: Bailer L/min.
Start: Finish:
Sample intake depth:

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☐ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
14:21	6	5.3	6.94	1434	-31.8	9.22	8.185	
14:40	12	6.9	6.97	1369	-41.2	5.54	8.193	
14:50	18	5.1	7.03	1376	-37.1	7.92	8.189	Flow meter battery change
15:00	24	5.5	7.02	1359	-30.2	5.94	8.188	
15:10	30	5.2	7.04	1376	-30.5	7.57	8.188	
15:20	36	5.0	6.97	1352	-24.1	8.91	8.189	
15:30	42	5.0	6.99	1354	-23.0	8.39	8.190	

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☐ No If yes
Sheen: ☐ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
Diss metal	☐ Plastic	☐ Glass		1						☑ Yes	☐ No	HNO_3
Diss Hg	☐ Plastic	☑ Glass	1							☐ Yes	☐ No	HCl
PAH	☐ Plastic	☑ Glass			2					☐ Yes	☑ No	✓
VOC/VPH	☐ Plastic	☑ Glass	3							☐ Yes	☐ No	✓
Chloride	☐ Plastic	☐ Glass		1						☐ Yes	☐ No	no
F2-F4	☐ Plastic	☑ Glass			2					☐ Yes	☐ No	no
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 3815-05
Field Dup.
Consumables: ☐ Waterra Tubing ☐ HDPE/Teflon Tubing ☑ Groundwater Filter
☐ Silicon Tubing ☐ D.O. Ampoules ☐ Footvalve

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☒ Purging/Sampling

Well No.: K19-MW17-07

Project Name: K-19 Tritch-AK Hwy
Location: Tritch BC
Weather: Sunny
Temperature: ~15°C
GPS Coordinates:
Project No.: 1657709-5000
Date: 2017 - 20 - July
Completed By: D.Klammer
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 10:40
Depth to Product: – m
Product Thickness: m
Depth to Water (A): 5.456 m below ☐ TOP
Depth to Bottom of Well (B): 11.710 m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good
Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: 0.1 ppm
One Well Volume:
(B-A)*2.0 = 12.508 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump
☐ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☒ Peristaltic
☐ Submersible
☐ Bladder

Multimeter Model: YSI Pro Plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redox) Meter Model:
Organic Vapour Meter Model:

☐ Rental Equipment:
☐ Field Bump
☐ pH4
☐ pH7
☐ pH10
☐ 1413 us/cm

Pump Details: GeoPump
☐ D.O. Ampoule
☒ Field Calibration DO, pH 7410, Cond

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X ______ = ______ litres
Start: 10:51
Finish:
Avg. Flow Rate: ~0.2L/min L/min.
Sample intake depth:

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. [✓ uS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O₂* (mg/L)	DTW Water Level (m)	Remarks
10:53	0.3	6.6	6.82	85.7	16.6	24.32	5.649	clear, NO, NS
10:58	1.5	6.7	6.69	86.7	-29.7	17.14	6.071	clear, NO, NS
11:03	2.5	6.6	6.69	89.4	-26.7	13.90	6.560	" " "
11:08	3.5	6.8	6.70	89.6	-12.6	12.00	6.850	" " "
11:13	4.5	7.1	6.71	61.5	-5.7	10.85	7.201	" " "
* Drawing down ~~→ Purge dry and sample tomorrow~~ → DTW stabilized @ 7.702; resume purge								
11:21	5.5	7.9	6.40	42.5	29.5	7.82	7.805	
11:26	6.5	7.2	6.33	44.8	42.5	7.15	7.855	

* Record DO in Mg/L, not percentage

* see pg. 2

Comments:
Odour: ☐ Yes ☐ No If yes
Sheen: ☐ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Very Silty

Analysis	Type		40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
			Container Size									
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No.
Field Dup.
Consumables: ☐ Waterra Tubing ☐ HDPE/Teflon Tubing ☐ Groundwater Filter
☐ Silicon Tubing ☐ D.O. Ampoules ☐ Footvalve

1/2

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☐ Purging/Sampling

Well No.: K19-MW17-07

Project Name: K-19 Tntch-AK Hwy
Location: Tntch BC
Weather: _____ **Temperature:** _____
GPS Coordinates: _____

Project No.: 1657709-5000
Date: 2017-20-July
Completed By: _____
Reviewed By: _____

MONITORING WELL INFORMATION

Time of Measurement: _____
Depth to Product: _____ m Product Thickness: _____ m
Depth to Water (A): _____ m below ☐ TOP
Depth to Bottom of Well (B): _____ m below ☐ TOP
Diameter of Standpipe: _____ mm
Well Condition: _____

Tidally Influenced: ☐ Yes ☐ No
Pressurized: ☐ Yes ☐ No
Well Headspace: _____ ppm
One Well Volume:
(B-A)*2.0 = _____ Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = _____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra
☐ Hydrolift
☐ Bailer (Type: _____)
☐ Peristaltic
☐ Submersible
☐ Bladder

Multimeter Model: _____ ☐ Rental Equipment:
pH/Temp Meter Model: _____
Conductivity Meter Model: _____ ☐ Field Bump
Dissolved Oxygen Meter Model: _____ ☐ pH4 _____ ☐ pH7 _____
ORP (Redex) Meter Model: _____ ☐ pH10 _____
Organic Vapour Meter Model: _____ ☐ 1413 us/cm _____

Pump Details: _____ ☐ D.O. Ampoule ☐ Field Calibration _____

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X _____ = _____ litres
Avg. Flow Rate: _____ L/min.
Start: _____ Finish: 12:00 July 20, 2017
Sample intake depth: _____

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. (uS/cm) or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
11:31	7.5	9.1	6.30	378	41.2	6.99	7.860	clear, NO INS
11:36	8.5	9.8	6.31	421	38.4	6.98	7.901	" " "
* Switch to bailer for sample @ 11:45; too deep for peristaltic w/ VOCs								
Finished sampling w/ Teflon bailer @ 12:00; DTW: →							8.802	collected VOCs first

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes _____
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear ☒ I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
* BTEX/VPH/VOC	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	Sodium bisulf
* F2-F4	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	none
* LHIP	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	sodium bisulf
* Dissolved Metals / Mg	☒ Plastic	☒ Glass	1		2					☒ Yes	☐ No	nitric (acid) / HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03815-02 Consumables: ☒ Waterra Tubing ~2m 1/4" ☐ HDPE/Teflon Tubing 1 ☒ Groundwater Filter
Field Dup. _____ ☒ Silicon Tubing ~0.10m ☐ D.O. Ampoules _____ ☐ Footvalve

* bailer already in well

Golder Associates

2/2

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☑ Purging/Sampling
Well No.: K19-MW17-10

Project Name: K-19 Tatch-AK Hwy
Location: Tatch BC
Weather: Sunny
Temperature: ~20°C
GPS Coordinates:
Project No.: 1657709-5000
Date: 2017 - 25 - July
Completed By: DK
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 09:15
Depth to Product: – m
Product Thickness: – m
Depth to Water (A): 5.504 m below ☑ TOP
Depth to Bottom of Well (B): 9.527 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good
Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: – ppm
One Well Volume:
(B-A)*2.0 = 8.046 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☑ Peristaltic
☐ Submersible
☐ Bladder

Multimeter Model: YSI ProPlus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redox) Meter Model:
Organic Vapour Meter Model: –

☐ Rental Equipment:
☐ Field Bump
☐ pH4
☐ pH7
☐ pH10
☐ 1413 us/cm

Pump Details: Geo pump
☐ D.O. Ampoule
☑ Field Calibration DO, 7, 4, 10, 1413

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 24.14 litres
Avg. Flow Rate: 200 mL/min ~~L/min.~~
Start: 09:24
Finish: 09:58
Sample intake depth: ~0.5 - 0.75 m above bottom

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
09:28	0.4	6.7	5.78	2796	43.5	3.95	5.772	*clear, NO, NS
09:32	1.5	6.7	5.79	2770	47.3	3.90	6.020	" " "
09:37	2.2	6.9	5.81	2742	48.3	4.01	6.356	" " "
* sampling @ 09:40 : >6W purged w/ waterra over previous days								
Done sampling @ 09:58 →							7.096m	

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear ☒ I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
BTEX/VPH/VOC	☐ Plastic	☑ Glass	3							☐ Yes	☑ No	Sodium bisulfate
L/H/PAH	☐ Plastic	☑ Glass			2					☐ Yes	☑ No	" "
F2-F4	☐ Plastic	☑ Glass			2					☐ Yes	☑ No	none
chloride	☑ Plastic	☐ Glass		1						☐ Yes	☑ No	none
d. metals	☑ Plastic	☐ Glass		1						☑ Yes	☐ No	HNO_3
d. Hg	☐ Plastic	☑ Glass	1							☑ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

*10 containers

SCN No. 03765-01
Field Dup. –
Consumables: ☐ Waterra Tubing
☑ Silicon Tubing ~0.10'
☑ HDPE/Teflon Tubing ~10m
☐ D.O. Ampoules
☑ Groundwater Filter
☐ Footvalve

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* purged dry w/ waterra 76 times over past few days; sample after 3 parameters as instructed even though drawing down

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☑ Purging/Sampling Well No.: K19-MW12-10

Project Name: K-19 Tritch-AK Hwy **Project No.:** 1657709-5000
Location: Tritch BC **Date:** 2017-25-July
Weather: Sunny **Temperature:** ~20°C **Completed By:** DG
GPS Coordinates: **Reviewed By:**

MONITORING WELL INFORMATION

Time of Measurement: 09:15
Depth to Product: - m Product Thickness: - m
Depth to Water (A): 5.504 m below ☑ TOP
Depth to Bottom of Well (B): 9.527 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: - ppm
One Well Volume:
(B-A)*2.0 = 8.046 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type:____) ☑ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: Geopump

Multimeter Model: YSI ProPlus ☐ Rental Equipment:
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Field Bump ☐ pH4 ____ ☐ pH7 ____ ☐ pH10 ____ ☐ 1413 us/cm ____
☑ Field Calibration DO, 7, 4, 10, 1413

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 24.14 litres Start: 09:24 Finish: 09:58
Avg. Flow Rate: 200 mL/min ~~L/min~~ Sample intake depth: ~0.5 - 0.75 m above bottom

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☐ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
09:28	0.4	6.7	5.78	2796	43.5	3.95	5.772	* clear, NO, NS
09:33	1.5	6.7	5.79	2770	47.3	3.90	6.020	" " "
09:57	2.2	6.9	5.81	2742	48.3	4.01	6.356	" " "
* sampling @ 09:40 = >6W purged w/ waterra over previous days								
Done sampling @ 09:58							7.096m	

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes ____
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear |||||||||||||||||||||||||||||||||||| Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
BTEX/VPH/VOC	☐ Plastic	☑ Glass	3							☐ Yes	☒ No	Sodium bisulfate
L/H/PAH	☐ Plastic	☑ Glass			2					☐ Yes	☒ No	" "
F_2-F_4	☐ Plastic	☑ Glass			2					☐ Yes	☒ No	none
chloride	☒ Plastic	☐ Glass		1						☐ Yes	☒ No	none
2. metals	☒ Plastic	☐ Glass		1						☒ Yes	☐ No	HNO_3
2. Hg	☐ Plastic	☒ Glass	1							☒ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

*10 containers

SCN No. 03765-01 Consumables: ☐ Waterra Tubing ____ ☒ HDPE/Teflon Tubing ~10m ☒ Groundwater Filter
Field Dup. - ☒ Silicon Tubing ~0.10 ☐ D.O. Ampoules ____ ☐ Footvalve

* purged drg w/ waterra >6 times over past few days/sample after 3 parameters as instructed even though drawing down

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☒ Development ☐ Purging/Sampling Well No.: K19-MW17-1

Project Name: K-19 Tntch-AK Hwy **Project No.:** 1657709-5000
Location: Tntch BC **Date:** 2017 - -
Weather: _____ **Temperature:** _____ **Completed By:** _____
GPS Coordinates: _____ **Reviewed By:** _____

MONITORING WELL INFORMATION

Time of Measurement: _____
Depth to Product: _____ m Product Thickness: _____ m
Depth to Water (A): _____ m below ☐ TOP
Depth to Bottom of Well (B): _____ m below ☐ TOP
Diameter of Standpipe: _____ mm
Well Condition: _____

Tidally Influenced: ☐ Yes ☐ No
Pressurized: ☐ Yes ☐ No
Well Headspace: _____ ppm
One Well Volume:
(B-A)*2.0 = _____ Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = _____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type: _____) ☐ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: _____

Multimeter Model: _____ ☐ Rental Equipment:
pH/Temp Meter Model: _____
Conductivity Meter Model: _____ ☐ Field Bump
Dissolved Oxygen Meter Model: _____ ☐ pH4 _____ ☐ pH7 _____
ORP (Redex) Meter Model: _____ ☐ pH10 _____
Organic Vapour Meter Model: _____ ☐ 1413 us/cm _____
☐ D.O. Ampoule ☐ Field Calibration _____

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X _____ = _____ litres Start: _____ Finish: 11:50 July 23, 2017
Avg. Flow Rate: _____ L/min. Sample intake depth: _____

Date July 23

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☐ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
* (above @ 16:00 on 23-July-2017)							5.624	
16:45	36.5	6.3	5.82	2.51	638	5.00	8.542	silty, NO NS, drying
16:50	44						dry, developed fully	

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☐ No If yes _____
Sheen: ☐ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. _____ Consumables: ☐ Waterra Tubing _____ ☐ HDPE/Teflon Tubing _____ ☐ Groundwater Filter
Field Dup. _____ ☐ Silicon Tubing _____ ☐ D.O. Ampoules _____ ☐ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☑ Purging/Sampling Well No.: K19-MW17-11

Project Name: K-19 Triten-AK Hwy **Project No.:** 1657709-5000
Location: Triten BC **Date:** 2017-07-16
Weather: Overcast **Temperature:** ~12°C **Completed By:** KDB
GPS Coordinates: **Reviewed By:**

MONITORING WELL INFORMATION

Time of Measurement: 13:43
Depth to Product: — m Product Thickness: — m
Depth to Water (A): 3.087 m below ☒ TOP
Depth to Bottom of Well (B): 14.803 m below ☒ TOP
Diameter of Standpipe: 51 mm
Well Condition:

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 9.6 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = — Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type:) ☒ Peristaltic ☐ Submersible ☐ Bladder
Pump Details:

Multimeter Model: YSI Prof ☐ Rental Equipment:
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☒ Field Bump ☐ pH4 ☐ pH7 ☐ pH10 ☒ 1413 us/cm
☐ Field Calibration DO

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 28.8 litres Start: 14:14 Finish: 15:06
Avg. Flow Rate: L/min. Sample intake depth: ~7.0m

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☐ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
14:17	1	4.4	7.34	411.2	-2.6	8.85	3.555	clear
14:21	2	4.3	7.02	404.5	-5.0	8.46	3.770	
14:25	3	4.0	6.89	401.9	-5.5	8.62	4.025	
14:30	4	3.9	6.85	402.2	-7.9	8.57	4.267	
14:35	5	3.8	6.84	403.6	-11.3	8.57	4.420	
14:39	5.5	4.7	6.82	404.3	-14.0	8.00	4.355	
14:43	6	4.5	6.81	404.1	-15.7	8.25	4.320	
14:46	96.5	4.4	6.81	404.7	-18.2	8.11	4.305	
14:50	7	4.5	6.80	404.5	-19.8	8.17	4.308	Sample due to

* Record DO in Mg/L, not percentage

Comments: Stable parameters
Odour: ☐ Yes ☒ No If yes
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear (1) 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
D. Metals	☒ Plastic	☒ Glass	1	1						☒ Yes	☐ No	HCl, HNO_3
Sodium	☐ Plastic	☐ Glass		1						☐ Yes	☒ No	
Chloride	☒ Plastic	☐ Glass		1						☐ Yes	☒ No	
VOCs	☐ Plastic	☒ Glass		3						☐ Yes	☒ No	
LEPH/HEPH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03830-01
Field Dup.
Consumables: ☐ Waterra Tubing ☒ HDPE/Teflon Tubing 6m ☐ Groundwater Filter
☒ Silicon Tubing 0.3 ☐ D.O. Ampoules ☐ Footvalve

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☒ Purging/Sampling

Well No.: K19-MW17-1

Project Name: K-19 Trutch-AK Hwy
Location: Trutch BC
Weather: ~~~15-20°C~~ Sunny **Temperature:** ~15-20°C
GPS Coordinates:
Project No.: 1657709-5000
Date: 2017-19-07
Completed By: D. Klammer
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 14:10
Depth to Product: – m
Product Thickness: m
Depth to Water (A): 7.887 m below ☒ TOP
Depth to Bottom of Well (B): 13.734 m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition:

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: – ppm
One Well Volume:
(B-A)*2.0 = [illegible] Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type:) ☒ Peristaltic ☐ Submersible ☐ Bladder

Multimeter Model: YSI ProPlus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redox) Meter Model:
Organic Vapour Meter Model: –

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ☐ pH7
☐ pH10
☐ 1413 us/cm

Pump Details: Geopump
☐ D.O. Ampoule
☒ Field Calibration DO, pH 7, 4, 10, Cond.

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = ~~35.22~~ litres
Avg. Flow Rate: ~200 L/min.
Start: 14:34/15:00 Finish:
Sample intake depth:

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. (µS/cm) or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
* 14:40 - Pause Purging → YSI problems; Resume @ 1800 following bumptest								
18:02	0.3	19.3	6.87	10.0	59.7	13.05	7.878	clear, NO, NS
July 18 * YSI problems again; switch YSI							~~8.085~~	
15:11	1	20.2	7.03	4.8	29.3	8.94	8.085	" " "
15:16	2	20.9	7.10	0.2	127.1	8.16	8.245	" " "
15:21	3	21.3	7.07	1.1	177.4	8.33	8.535	" " "
15:26	3.5	21.2	7.08	0.2	73.3	8.20	8.665	* drawing down; purge w/ bailer; return tomorrow to bailer sample
16:00	* purged dry; removed 12-13L total; final 2 bailers very silty							

* Record DO in Mg/L, not percentage

* See pg. 2/2 for sampling

Comments:
Odour: ☐ Yes ☐ No If yes
Sheen: ☐ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☒ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No.
Field Dup.
Consumables: ☐ Waterra Tubing ☐ Silicon Tubing ☐ HDPE/Teflon Tubing ☐ D.O. Ampoules ☐ Groundwater Filter ☐ Footvalve

1/2

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☑ Purging/Sampling
Well No.: K19MW17-19

Project Name: K-19 Tutch-AK Hwy
Location: Tutch BC
Weather: Sunny **Temperature:** ~15°C
GPS Coordinates:
Project No.: 1657709-5000
Date: 2017-20-July
Completed By: D.K Lamont
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 09:10
Depth to Product: — m Product Thickness: — m
Depth to Water (A): 7.001 m below ☐ TOP
Depth to Bottom of Well (B): 13.734 m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☑ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 13.546 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☒ Bailer (Type: Teflon) ☐ Peristaltic ☐ Submersible ☐ Bladder
Pump Details:

Multimeter Model: YSI ProPlus ☐ Rental Equipment:
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model: —
☐ D.O. Ampoule

☐ Field Bump ☐ pH4 ____ ☐ pH7 ____ ☐ pH10 ____ ☐ 1413 us/cm ____
☑ Field Calibration ____

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X ____ = ____ litres
Avg. Flow Rate: ____ L/min.
Start: 14:34 July 18, 2017 Finish: 09:50 July 20, 2017
Sample intake depth: Bailed @ screen

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
* Purged 1 well	volume on July 18. Well > recovered. Sample w/ Teflon bailer due to depth and							
BTEX/VPH								
09:30 - Sampling								
09:50 - Sampling	completed							
09:50	14 L	12.3	6.85	769	13.3	3.46	7.753	clear

July 20

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes ____
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear |X| Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
L/M/PAH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	Sodium bisulfate
BTEX/VPH	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	" "
Dissolved Hg	☒ Plastic	☒ Glass	1	2						☒ Yes	☐ No	nitric/nitric/HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03815-61 Consumables: ☐ Waterra Tubing ____ ☐ HDPE/Teflon Tubing 1 ☒ Groundwater Filter
Field Dup. — ☐ Silicon Tubing ____ ☐ D.O. Ampoules ____ ☐ Footvalve

+1 Teflon bailer

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☒ Purging/Sampling

Well No.: K19-MW17-13

Project Name: K-19 Tritch-AK Hwy
Location: Tritch BC
Weather: Rain **Temperature:** ~12°C
GPS Coordinates:
Project No.: 1657709-5000
Date: 2017-07-26
Completed By: KPB
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 615:15
Depth to Product: ___ m Product Thickness: ___ m
Depth to Water (A): 5683 m below ☒ TOP
Depth to Bottom of Well (B): 11.130 m below ☒ TOP
Diameter of Standpipe: ___ mm
Well Condition:
Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: ___ ppm
One Well Volume:
(B-A)*2.0 = 11 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ___ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump
☐ Waterra
☐ Hydrolift
☐ Bailer (Type: ___)
☒ Peristaltic
☐ Submersible
☐ Bladder

Multimeter Model: YSI Prot
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:

☐ Rental Equipment:
☒ Field Bump
☒ pH4 ☒ pH7
☒ pH10
☒ 1413 us/cm
☒ Field Calibration DO

Pump Details:
☐ D.O. Ampoule

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X ___ = ___ litres
Avg. Flow Rate: ___ L/min.
Start: 15:22 Finish: 1622
Sample intake depth: ~10.5m

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond ☐ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
15:26	1	5.1	6.84	496.3	-11.1	6.89	6.045	
15:30	2	5.4	6.82	501.6	-10.9	6.51	6.205	
15:35	3	5.6	6.81	507.9	-11.7	6.74	6.220	
15:40	3.5	5.7	6.80	509.6	-13.0	6.80	6.249	
15:45	4	5.9	~~6.86~~ 6.80	509.7	-13.8	5.87	6.245	
15:50	4.5	5.8	6.79	511.3	-14.5	5.74	6.256	
15:55	5.0	5.7	6.79	507.1	-14.9	5.91	6.274	
		Sampled	Due to Stable parameters					

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
D. Metals	☒ Plastic	☒ Glass	1	1						☒ Yes	☐ No	HCl, HNO3
LFPH/HF	☐ Plastic	☒ Glass			24					☐ Yes	☒ No	NaHSO4
VOCs	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	NaHSO4
Chloride	☒ Plastic	☐ Glass		1						☐ Yes	☒ No	—
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03830-04
Field Dup.
Consumables: ☐ Waterra Tubing ___ ☒ HDPE/Teflon Tubing 13m ☐ Groundwater Filter
☒ Silicon Tubing 0.3 ☐ D.O. Ampoules ___ ☐ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☒ Purging/Sampling

Well No.: K19-MW17-17

Project Name: K-19 Trutch-AK Hwy
Location: Trutch BC
Weather: Sunny w/clouds **Temperature:** ~10 - 15°C
GPS Coordinates:

Project No.: 1657709-5000
Date: 2017 - 26 - July
Completed By: DK
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 10:40
Depth to Product: - m
Product Thickness: - m
Depth to Water (A): 4.689 m below ☒ TOP
Depth to Bottom of Well (B): 8.778 m below ☒ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: - ppm
One Well Volume:
(B-A)*2.0 = 8.178 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ______ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra
☐ Hydrolift
☐ Bailer (Type: ______)
☒ Peristaltic
☐ Submersible
☐ Bladder

Pump Details: Geopump

Multimeter Model: YSI Pro Plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redox) Meter Model:
Organic Vapour Meter Model: -
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ______ ☐ pH7 ______
☐ pH10 ______
☐ 1413 us/cm ______
☒ Field Calibration 7, 4, 10, DO, 1413

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 24.534 litres
Avg. Flow Rate: 100-300mL /min.
Start: 10:46 Finish: 11:52
Sample intake depth: ~0.50 - 0.75m above bottom

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
10:48	0.3	8.4	-	-	-	-	4.870	clear, NO, NS
10:53	1.5	6.5	7.33	519.9	13.3	6.43	5.158	" " "
10:58	2.7	6.0	7.28	512.2	12.9	6.52	5.574	" " "
11:05	4.2	5.8	7.27	507.1	14.7	6.80	6.224	" " "
11:10	5.5	5.9	7.31	506.7	14.8	6.83	6.610	" " "
11:15	6.7	5.7	7.31	507.7	15.2	6.96	6.951	" " "
11:20	8.0	5.8	7.32	507.9	15.7	6.97	7.310	slow pump.
11:25	8.5	8.6	7.35	510.6	14.3	6.56	7.429	clear, NO, NS

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☐ No If yes ______
Sheen: ☐ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. ______
Field Dup. ______

Consumables: ☐ Waterra Tubing ______ ☐ HDPE/Teflon Tubing ______ ☐ Groundwater Filter
☐ Silicon Tubing ______ ☐ D.O. Ampoules ______ ☐ Footvalve

1/2

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☒ Purging/Sampling Well No.: K19-MW17-17

Project Name: K-19 Truck-AK Hwy **Project No.:** 1657709-5000
Location: Truck BC **Date:** 2017-26-July
Weather: _____ **Temperature:** _____ **Completed By:** _____
GPS Coordinates: _____ **Reviewed By:** _____

MONITORING WELL INFORMATION

Time of Measurement: _____
Depth to Product: _____ m Product Thickness: _____ m
Depth to Water (A): _____ m below ☐ TOP
Depth to Bottom of Well (B): _____ m below ☐ TOP
Diameter of Standpipe: _____ mm
Well Condition: _____

Tidally Influenced: ☐ Yes ☐ No
Pressurized: ☐ Yes ☐ No
Well Headspace: _____ ppm
One Well Volume:
(B-A)*2.0 = _____ Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = _____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type: _____) ☐ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: _____

Multimeter Model: _____ ☐ Rental Equipment:
pH/Temp Meter Model: _____
Conductivity Meter Model: _____ ☐ Field Bump
Dissolved Oxygen Meter Model: _____ ☐ pH4 _____ ☐ pH7 _____
ORP (Redex) Meter Model: _____ ☐ pH10 _____
Organic Vapour Meter Model: _____ ☐ 1413 us/cm _____
☐ D.O. Ampoule ☐ Field Calibration _____

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X _____ = _____ litres Start: 10:46 Finish: 11:52
Avg. Flow Rate: _____ L/min. Sample intake depth: _____

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☐ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
11:30	9.0	8.1	7.35	5162	14.6	6.45	7.480	clear, NO, NS
* Parameters generally within 10% → sample @ 11:51; finished @ 11:52							7.680	" " "

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes _____
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear |M| Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
BTEX/VPH/VOC	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	sodium bisulfate 8 bottles
L/H/PAH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	" "
chloride	☒ Plastic	☐ Glass		1						☐ Yes	☒ No	none
dissolved	☒ Plastic	☐ Glass								☒ Yes	☐ No	HNO_3
d. Hg	☐ Plastic	☒ Glass	1							☒ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03197-02 Consumables: ☐ Waterra Tubing _____ ☒ HDPE/Teflon Tubing ~9m ☒ Groundwater Filter
Field Dup. — ☒ Silicon Tubing ~0.10 ☐ D.O. Ampoules _____ ☐ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☒ Purging/Sampling

Well No.: K19-MW17-18

Project Name: K-19 Triteh-AK Hwy
Location: Triten Bc
Weather: Overcast **Temperature:** ~10 - 15°C
GPS Coordinates:

Project No.: 1657709-5000
Date: 2017 - 26 - July
Completed By: DK
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 12:10
Depth to Product: – m
Product Thickness: – m
Depth to Water (A): 4.095 m below ☒ TOP
Depth to Bottom of Well (B): 7.419 m below ☒ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: 6.648 ppm
One Well Volume:
(B-A)*2.0 = 6.648 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump
☐ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☒ Peristaltic
☐ Submersible
☐ Bladder

Multimeter Model: YSI Pro Plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:

☐ Rental Equipment:
☐ Field Bump
☐ pH4
☐ pH7
☐ pH10
☐ 1413 us/cm

Pump Details: Geopump
☐ D.O. Ampoule
☒ Field Calibration 7,4,10,DO,1413

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 19.944 litres
Avg. Flow Rate: ~100-300mL /min.
Start: 11:16
Finish: 12:20
Sample intake depth: ~0.50-0.75m above bottom

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
11:18	0.3	5.9	6.98	437.6	5.8	9.82	4.222	clear, NO, NS
11:23	1.8	5.8	6.83	431.5	8.7	8.97	4.620	" " "
11:28	3.2	6.1	6.74	427.5	13.4	8.25	5.073	" " "
11:33	4.7	6.0	6.74	427.2	13.9	8.45	5.505	" " "
11:38	6.0	6.3	6.73	426.9	12.2	7.94	5.839	" " "
11:43	7.2	6.1	6.71	427.5	10.1	7.44	6.099	" " "
11:48	7.7	8.2	6.72	444.3	3.4	6.57	6.074	" " ", reduce pump rate
11:52	8.0	8.1	6.73	445.0	3.9	6.77	6.105	" " "

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear ☒ I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
BTEX/VPH/VOC	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	sodium bisulfate
L/H/PAH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	" "
Chloride	☒ Plastic	☐ Glass		1						☐ Yes	☒ No	none
d. metals	☒ Plastic	☐ Glass		1						☒ Yes	☐ No	HNO_3
d. Hg	☐ Plastic	☒ Glass	1							☒ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03797-03
Field Dup. –
Consumables: ☐ Waterra Tubing ☒ HDPE/Teflon Tubing ~8.0m ☒ Groundwater Filter
☒ Silicon Tubing ~0.10m ☐ D.O. Ampoules ☐ Footvalve

1/2

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☑ Purging/Sampling

Well No.: K19-MW17-18

Project Name: K-19 Trutch-AK Hwy
Location: Trutch BC
Weather: ______ **Temperature:** ______
GPS Coordinates: ______
Project No.: 1657709-5000
Date: 2017 - 26 - July
Completed By: DK
Reviewed By: ______

MONITORING WELL INFORMATION

Time of Measurement: ______
Depth to Product: ______ m
Product Thickness: ______ m
Depth to Water (A): ______ m below ☐ TOP
Depth to Bottom of Well (B): ______ m below ☐ TOP
Diameter of Standpipe: ______ mm
Well Condition: ______
Tidally Influenced: ☐ Yes ☐ No
Pressurized: ☐ Yes ☐ No
Well Headspace: ______ ppm
One Well Volume:
(B-A)*2.0 = ______ Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ______ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra
☐ Hydrolift
☐ Bailer (Type: ______)
☐ Peristaltic
☐ Submersible
☐ Bladder
Pump Details: ______

Multimeter Model: ______
pH/Temp Meter Model: ______
Conductivity Meter Model: ______
Dissolved Oxygen Meter Model: ______
ORP (Redex) Meter Model: ______
Organic Vapour Meter Model: ______
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ______ ☐ pH7 ______
☐ pH10 ______
☐ 1413 us/cm ______
☐ Field Calibration ______

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X ______ = ______ litres
Avg. Flow Rate: ______ L/min.
Start: 11:16 Finish: 12:20
Sample intake depth: ______

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O₂* (mg/L)	DTW Water Level (m)	Remarks
11:57	8.8	8.1	6.73	443.6	3.4	7.26	6.144	clear, NO, NS
* Parameters stable; sample @ 12:01; finish @ 12:20 →							6.316	" " "

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☐ No If yes ______
Sheen: ☐ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. ______
Field Dup. ______
Consumables: ☐ Waterra Tubing ______ ☐ HDPE/Teflon Tubing ______ ☐ Groundwater Filter
☐ Silicon Tubing ______ ☐ D.O. Ampoules ______ ☐ Footvalve

2/2

(MW20)

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☒ Purging/Sampling Well No.: K19-MW17-19

Project Name: K-19 Tritch-AK Hwy **Project No.:** 1657709-5000
Location: Tritch BC **Date:** 2017-25-2017
Weather: Sunny, light breeze **Temperature:** ~20C **Completed By:** DK
GPS Coordinates: **Reviewed By:**

MONITORING WELL INFORMATION

Time of Measurement: 13:01
Depth to Product: — m Product Thickness: — m
Depth to Water (A): 3.160 m below ☐ TOP
Depth to Bottom of Well (B): 8.834 m below ☐ TOP
Diameter of Standpipe: — mm
Well Condition:

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☒ Yes ☐ No * rising head
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 11.348 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = — Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type:) ☒ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: Geopump

Multimeter Model: YSI ProPlus ☐ Rental Equipment:
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:

☐ Field Bump ☐ pH4 ☐ pH7 ☐ pH10 ☐ 1413 us/cm
☐ D.O. Ampoule ☒ Field Calibration DO, 7, 4, 10, 1413

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 34.0 litres Start: 1383 Finish: 14:03
Avg. Flow Rate: ~200 mL/min L/min. Sample intake depth: ~0.50-0.75 above bottom

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
13:15	0.5	8.7	7.10	572.1	16.4	3.85	3.262	*ran of pump slowed *rising head
13:20	2.0	8.9	7.02	570.2	17.4	3.97	3.295	clear, N.O.N.S
13:25	2.5	9.3	7.01	567.6	15.8	4.18	3.326	" " "
13:34	4.0	9.8	7.00	559.7	4.8	3.69	3.333	" " "
13:39	5.0	9.6	6.99	574.9	4.5	3.56	3.390	" " "
13:45	6.0	9.6	6.98	566.1	4.5	3.64	3.392	" " "
* Parameters stable → sampling @ 13:46							3.415	" " "
*14:03 - Finished sampling								

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear ☒ Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
BTEX/VPH/VOC	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	sodium bisulfate *HCl to pH<2
L/H/PAH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	" "
F2-F4	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	none
Chloride	☒ Plastic	☐ Glass		1						☐ Yes	☒ No	
d. metals	☒ Plastic	☐ Glass		1						☒ Yes	☐ No	HNO_3
d. Hg	☐ Plastic	☒ Glass	1							☒ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03765-03 Consumables: ☐ Waterra Tubing ☒ HDPE/Teflon Tubing ~0.25m ☒ Groundwater Filter
Field Dup. ☒ Silicon Tubing ~0.10m ☐ D.O. Ampoules ☐ Footvalve

*Height of stickup to TOP is 0.652m
*well locked and labelled

Golder Associates

(MW-11)

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☒ Purging/Sampling Well No.: K19-MW17-20

Project Name: K-19 Tritch-AK Hwy **Project No.:** 1657709-5000
Location: Tritch BC **Date:** 2017-25-July
Weather: Sunny **Temperature:** ~25°C **Completed By:** DK
GPS Coordinates: **Reviewed By:**

MONITORING WELL INFORMATION

Time of Measurement: 16:10
Depth to Product: - m Product Thickness: - m
Depth to Water (A): 2.012 m below ☒ TOP
Depth to Bottom of Well (B): 6.804 m below ☒ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good

Tidally Influenced: ☐ Yes ☐ No
Pressurized: ☐ Yes ☐ No
Well Headspace: _____ ppm
One Well Volume:
(B-A)*2.0 = 8.584 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = _____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type: _____) ☒ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: Geopump

Multimeter Model: YSI ProPlus ☐ Rental Equipment:
pH/Temp Meter Model:
Conductivity Meter Model: ☐ Field Bump
Dissolved Oxygen Meter Model: ☐ pH4 _____ ☐ pH7 _____
ORP (Redex) Meter Model: ☐ pH10 _____
Organic Vapour Meter Model: ☐ 1413 us/cm _____
☐ D.O. Ampoule ☒ Field Calibration DO, 7, 4, 10, 1413

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 25.752 litres Start: 16:13 Finish: _____
Avg. Flow Rate: _____ L/min. Sample intake depth: _____

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
16:15	0.1	8.4	6.87	460.5	28.8	7.97	2.204	clear, NO, NS
16:20	1.1	8.0	6.75	454.7	36.3	6.97	2.491	" " "
16:25	2.5	8.4	6.72	454.7	38.2	6.00	2.702	" " " ↓decrease pump
16:30	3.5	8.3	6.68	455.9	36.7	4.97	2.846	" " "
16:36	4.5	8.4	6.65	450.1	36.2	4.32	2.970	" " "
16:42	5.7	8.3	6.66	449.1	37.1	3.95	3.149	" " "
16:49	6.7	7.5	6.66	444.7	38.5	3.52	3.280	" " "
16:54	8.0	7.2	6.63	443.2	31.4	3.26	3.440	" " "

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☐ No If yes _____
Sheen: ☐ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. _____ Consumables: ☐ Waterra Tubing _____ ☐ HDPE/Teflon Tubing _____ ☐ Groundwater Filter
Field Dup. _____ ☐ Silicon Tubing _____ ☐ D.O. Ampoules _____ ☐ Footvalve

(MW-11)

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☒ Purging/Sampling Well No.: K19-MW17-20

Project Name: K-19 Tritch-AK Hwy **Project No.:** 1657709-5000
Location: Tritch BC **Date:** 2017 - -
Weather: _____ **Temperature:** _____ **Completed By:** _____
GPS Coordinates: _____ **Reviewed By:** _____

MONITORING WELL INFORMATION

Time of Measurement: _____
Depth to Product: _____ m Product Thickness: _____ m
Depth to Water (A): _____ m below ☐ TOP
Depth to Bottom of Well (B): _____ m below ☐ TOP
Diameter of Standpipe: _____ mm
Well Condition: _____

Tidally Influenced: ☐ Yes ☐ No
Pressurized: ☐ Yes ☐ No
Well Headspace: _____ ppm
One Well Volume:
(B-A)*2.0 = _____ Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = _____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type: _____) ☐ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: _____

Multimeter Model: _____ ☐ Rental Equipment:
pH/Temp Meter Model: _____
Conductivity Meter Model: _____ ☐ Field Bump
Dissolved Oxygen Meter Model: _____ ☐ pH4 _____ ☐ pH7 _____
ORP (Redex) Meter Model: _____ ☐ pH10 _____
Organic Vapour Meter Model: _____ ☐ 1413 us/cm _____
☐ D.O. Ampoule ☐ Field Calibration _____

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X _____ = _____ litres Start: _____ Finish: _____
Avg. Flow Rate: _____ L/min. Sample intake depth: _____

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
16:59	9.0	7.1	6.63	441.2	36.9	3.15	3.495	clear, NO, NS
17:04	9.5	8.0	6.62	448.3	37.0	3.16	3.475	" " "
17:09	10.3	7.7	6.58	446.3	35.9	2.97	3.451	" " "
*Well feble → sample @ 17:10, finished @ 17:25 →							3.554	" " "

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes _____
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear |||||||||||||||||||||||||||| Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
BTEX/VPH/VOC	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	Sodium bisulfate
L/H/BAFH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	" "
F2-F4	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	none
chloride	☐ Plastic	☐ Glass		1						☐ Yes	☒ No	"
d. metals	☒ Plastic	☐ Glass		1						☒ Yes	☐ No	HNO_3
d. Hg	☐ Plastic	☒ Glass	1							☒ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03765-06 Consumables: ☐ Waterra Tubing _____ ☒ HDPE/Teflon Tubing ~6x7.5m ☐ Groundwater Filter
Field Dup. _____ ☒ Silicon Tubing ~0.10 ☐ D.O. Ampoules _____ ☐ Footvalve

K10 ho

Golder Associates

(MW-9)

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☑ Purging/Sampling Well No.: KD-MW17-2

Project Name: K-19 Tritch-AK Hwy **Project No.:** 1657709-5000
Location: Tritch BC **Date:** 2017-25-July
Weather: Sunny **Temperature:** 25°C **Completed By:** DK
GPS Coordinates: **Reviewed By:**

MONITORING WELL INFORMATION

Time of Measurement: 14:30
Depth to Product: – m Product Thickness: – m
Depth to Water (A): 3.517 m below ☑ TOP
Depth to Bottom of Well (B): 10.775 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good

Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: – ppm
One Well Volume:
(B-A)*2.0 = 14.516 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type: ____) ☑ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: Geopump ☐ D.O. Ampoule

Multimeter Model: YSI ProPlus ☐ Rental Equipment:
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:

☐ Field Bump ☐ pH4 ____ ☐ pH7 ____ ☐ pH10 ____ ☐ 1413 us/cm ____
☑ Field Calibration 7,4,10, DO, 14B

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 43.548 litres Start: 14:47 Finish:
Avg. Flow Rate: ~200mL/min L/min. Sample intake depth: ~0.50-0.75m above bottom

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
14:50	0.1	7.8	7.87	378.0	-4.7	1.52	3.720	clear, NO, NS
14:55	1.1	7.6	7.06	367.0	-1.4	1.26	4.024	" " "
15:00	2.1	7.7	7.01	365.8	-0.9	1.08	4.265	" " "
15:06	3.5	10.0	7.01	359.7	-5.3	0.87	4.476	" " "
15:12	4.5	7.9	7.09	371.6	-10.0	0.89	4.520	" " "
15:17	5.5	8.5	7.08	372.9	-14.1	0.71	4.490	recovering
15:22	6.5	8.6	7.08	372.4	-15.6	0.64	4.460	recovering
15:27	7.5	8.8	7.08	367.6	-15.5	0.65	4.490	

* Record DO in Mg/L, not percentage * Stable parameters → sampling @ 15:30; dtw after sampling = 4.504 @ 15

Comments:
Odour: ☐ Yes ☑ No If yes
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear |||||||||||||||||||||||||||| Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
VOC/BTEX/MH	☐ Plastic	☑ Glass	2x3							☐ Yes	☐ No	Sodium bisulfate
L/H/PAH	☐ Plastic	☑ Glass			2x2					☐ Yes	☐ No	" "
chloride	☐ Plastic	☐ Glass		2x1						☐ Yes	☐ No	none
dimetals	☐ Plastic	☐ Glass		2x1						☐ Yes	☐ No	HNO_3
2.4g	☐ Plastic	☑ Glass	2x1							☐ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

#8 containers each

SCN No. 03765-04 Consumables: ☐ Waterra Tubing ____ ☐ HDPE/Teflon Tubing ~11m ☑ Groundwater Filter
Field Dup. 03765-05 ☑ Silicon Tubing ~0.10m ☐ D.O. Ampoules ____ ☐ Footvalve

#6 ticky is 0.68 m to TOP from ground surface

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☒ Purging/Sampling
Well No.: K19-MW17-22

Project Name: K-19 Trtch-AK Hwy
Location: Trtch BC
Weather: Overcast Temperature: ~10-15°C
GPS Coordinates:
Project No.: 1657709-5000
Date: 2017-27-July
Completed By: DK
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 13:00
Depth to Product: – m Product Thickness: – m
Depth to Water (A): 3.366 m below ☑ TOP
Depth to Bottom of Well (B): 9.844 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good
Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: – ppm
One Well Volume:
(B-A)*2.0 = 12.956 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☑ Peristaltic
☐ Submersible
☐ Bladder
Pump Details: Geopump

Multimeter Model: YSI Pro Plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redox) Meter Model:
Organic Vapour Meter Model: –
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ☐ pH7
☐ pH10
☐ 1413 us/cm
☑ Field Calibration DO, 7, 4, 10, 1413

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 38.868 litres
Avg. Flow Rate: L/min.
Start: 13:09 July 27 Finish: 13:07 July 28.
Sample intake depth: ~0.50-0.75 m above bottom

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
13:14	0.4	6.3	6.87	548.1	16.1	5.56	3.624	cloudy, NO, NS
13:19	1.9	5.9	6.65	526.7	15.7	2.81	4.154	clearing, NO, NS
13:23	2.8	5.8	6.62	521.0	14.2	2.90	4.501	clear " "
13:28	4.0	6.1	6.63	518.5	11.6	2.87	4.925	" " "
13:33	5.2	5.7	6.65	516.0	9.9	2.94	5.495	" " "
13:38	6.4	5.4	6.66	518.3	9.4	3.39	5.943	" " "
13:43	7.9	5.6	6.69	516.2	8.0	3.49	6.480	slow pump
13:48	8.7	7.7	6.69	515.4	6.5	3.09	6.691	clear, NO, NS

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☐ No If yes
Sheen: ☐ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
BTEX/VPH/VOC	☐ Plastic	☑ Glass	3							☐ Yes	☒ No	sodium bisulfate
L/H/PAH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	" "
chloride	☑ Plastic	☐ Glass		1						☐ Yes	☒ No	none
d. metals	☒ Plastic	☐ Glass		1						☒ Yes	☐ No	HNO_3
d. Hg	☐ Plastic	☒ Glass	1							☑ Yes	☐ No	HCl
F2-F4	☐ Plastic	☑ Glass			2					☐ Yes	☑ No	sodium bisulfate
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03762-04
Field Dup. –
Consumables: ☐ Waterra Tubing
☑ Silicon Tubing ~0.1m
☑ HDPE/Teflon Tubing ~10.25m
☐ D.O. Ampoules
☒ Groundwater Filter
☐ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☒ Purging/Sampling

Well No.: K19-MW17-22

Project Name: K-19 Trutch-AK Hwy
Location: Trutch BC
Weather: ______ Temperature: ______
GPS Coordinates: ______
Project No.: 1657709-5000
Date: 2017 - -
Completed By: ______
Reviewed By: ______

MONITORING WELL INFORMATION

Time of Measurement: ______
Depth to Product: ______ m Product Thickness: ______ m
Depth to Water (A): ______ m below ☐ TOP
Depth to Bottom of Well (B): ______ m below ☐ TOP
Diameter of Standpipe: ______ mm
Well Condition: ______
Tidally Influenced: ☐ Yes ☐ No
Pressurized: ☐ Yes ☐ No
Well Headspace: ______ ppm
One Well Volume:
(B-A)*2.0 = ______ Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ______ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra
☐ Hydrolift
☐ Bailer (Type: ______)
☐ Peristaltic
☐ Submersible
☐ Bladder
Pump Details: ______

Multimeter Model: ______
pH/Temp Meter Model: ______
Conductivity Meter Model: ______
Dissolved Oxygen Meter Model: ______
ORP (Redox) Meter Model: ______
Organic Vapour Meter Model: ______
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ______ ☐ pH7 ______
☐ pH10 ______
☐ 1413 us/cm ______
☐ Field Calibration ______

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X ______ = ______ litres
Avg. Flow Rate: ______ L/min.
Start: ______ Finish: ______
Sample intake depth: ______

Date	Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O₂* (mg/L)	DTW Water Level (m)	Remarks
	13:53	9.2	7.9	6.69	515.7	5.5	3.00	6.802	drawing down → purge dry
	14:19	20.0 → purged dry → return tomorrow to sample						dry	
July 28, 20	12:45 → sample immediately, then collect one set of params.							3.802	
	13:07	–	8.7	7.35	520.1	-36.5	4.59	4.585	* sampling complete

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes ______
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear X I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. ______
Field Dup. ______
Consumables: ☐ Waterra Tubing ______ ☐ HDPE/Teflon Tubing ______ ☐ Groundwater Filter
☐ Silicon Tubing ______ ☐ D.O. Ampoules ______ ☐ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☒ Purging/Sampling
Well No.: K19-MW17-23

Project Name: K-19 Tntch-AK Hwy
Location: Tntch BC
Weather: Sunny w/ clouds **Temperature:** ~10-15°C
GPS Coordinates:
Project No.: 1657709-5000
Date: 2017-27-July
Completed By: DK
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 09:50
Depth to Product: – m Product Thickness: – m
Depth to Water (A): 7.760 m below ☐ TOP
Depth to Bottom of Well (B): 13.750 m below ☒ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: – ppm
One Well Volume:
(B-A)*2.0 = 11.98 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra
☐ Hydrolift
☒ Bailer (Type: Teflon)
☒ Peristaltic
☐ Submersible
☐ Bladder

Pump Details: Geopump

Multimeter Model: YSI ProPlus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ☐ pH7
☐ pH10
☐ 1413 us/cm
☒ Field Calibration DO, 7, 4, 10, 1413

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 35.94 litres
Avg. Flow Rate: L/min.
Start: 09:54 July 27 Finish: 12:10 July 28
Sample intake depth:

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. μS/cm or mS/cm (circle one)	Redox (mV)	Diss. O₂* (mg/L)	DTW Water Level (m)	Remarks
*Too deep for peristaltic, switch to Teflon bailer → bail 3WV and sample tomorrow								
10:11	5	6.4	7.28	878	-2.9	5.85	9.30	cloudy, NO, NS
10:20	14	6.6	7.86	829	-19.2	6.16	11.095	" " "
10:30	23	5.7	8.01	809	3.3	8.45	13.805	" " "
July 28 → 11:40 → bailed dry yesterday, take one set of params, then sample							7.929	" " "
→		8.4	7.78	863	-7.2	3.33	–	Bailer sampling @ 11:50
* sampling completed @ 12:10, sampled w/ bailer								

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I ☒ I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
BTEX/VPH/VOC	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	sodium bisulfate
L/HEPH/PAH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	" "
chloride	☒ Plastic	☐ Glass		1						☐ Yes	☒ No	none
d metal	☒ Plastic	☐ Glass		1						☒ Yes	☐ No	HNO₃
d Hg	☐ Plastic	☒ Glass	1							☒ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

#8 containers

SCN No. 03762-03
Field Dup. –
Consumables: ☐ Waterra Tubing ☒ Silicon Tubing ~0.10 ☒ HDPE/Teflon Tubing 14 ☐ D.O. Ampoules ☒ Groundwater Filter ☐ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☒ Purging/Sampling Well No.: K19-MW17-24

Project Name: K-19 Tritch-AK Hwy **Project No.:** 1657709-5000
Location: Tritch BC **Date:** 2017-26-July
Weather: Overcast **Temperature:** ~10°C **Completed By:** D. Klamar
GPS Coordinates: **Reviewed By:**

MONITORING WELL INFORMATION

Time of Measurement: 13:45
Depth to Product: — m Product Thickness: — m
Depth to Water (A): 2.330 m below ☒ TOP
Depth to Bottom of Well (B): 5.910 m below ☒ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 7.16 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = — Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type:) ☒ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: Geopump

Multimeter Model: YSI Pro Plus ☐ Rental Equipment:
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model: —
☐ D.O. Ampoule

☐ Field Bump
☐ pH4 ☐ pH7
☐ pH10
☐ 1413 us/cm
☐ Field Calibration

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 21.48 litres Start: 13:50 Finish:
Avg. Flow Rate: L/min. Sample intake depth: ~0.50 - 0.75 m above bottom

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
15:53	0.6	5.8	7.07	455.9	2.5	2.80	2.340	clear, NO, NS
15:58	2.0	6.0	6.24	436.7	-4.5	2.67	2.386	" " "
14:05	4.5	6.0	6.96	435.7	-27.9	2.07	2.372	" " "
14:10	5.5	6.5	6.97	435.3	-28.9	2.17	2.350	" " "
14:17	7.0	6.5	6.96	437.0	-33.2	2.17	2.346	" " "
* stable parameters; sample @ 14:19; finish sampling @ 14:43							2.345	" " "

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear |||||||||||||||||||||||||||||||| Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
BTEX/VPH/LMW	☐ Plastic	☐ Glass	2x3							☐ Yes	☒ No	sodium bisulfate
LMW/PAH	☐ Plastic	☐ Glass			2x2					☐ Yes	☒ No	" "
F1-F4	☐ Plastic	☐ Glass			2x2					☐ Yes	☒ No	none
chloride	☐ Plastic	☐ Glass		2x1						☐ Yes	☒ No	none
cyanide	☐ Plastic	☐ Glass		2x1						☒ Yes	☐ No	HNO_3
8 Hg	☐ Plastic	☐ Glass		2x1						☒ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

10 containers each

SCN No. 03797-04 Consumables: ☐ Waterra Tubing ☒ HDPE/Teflon Tubing ~0.625m ☒ Groundwater Filter
Field Dup. 03797-05 ☒ Silicon Tubing ~0.10 ☐ D.O. Ampoules ☐ Footvalve

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☒ Purging/Sampling Well No.: K19-MW17-25

Project Name: K-19 Tntch-AK Hwy **Project No.:** 1657709-5000
Location: Tntch BC **Date:** 2017-26-July
Weather: sunny w/ clouds **Temperature:** ~15°C **Completed By:** DK
GPS Coordinates: **Reviewed By:**

MONITORING WELL INFORMATION

Time of Measurement: 14:58
Depth to Product: — m Product Thickness: — m
Depth to Water (A): 3.944 m below ☒ TOP
Depth to Bottom of Well (B): 7.273 m below ☒ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 6.658 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = — Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type:_____) ☒ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: Geopump

Multimeter Model: YSI Pro Plus ☐ Rental Equipment:
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Field Bump ☐ pH4 _____ ☐ pH7 _____ ☐ pH10 _____ ☐ 1413 us/cm _____
☒ Field Calibration 7, 4, 10, 1413, 80

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 19.974 litres Start: 15:10 Finish: 15:53
Avg. Flow Rate: _____ L/min. Sample intake depth: ~0.50-0.75 m above bottom

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
15:12	0.2	6.5	7.18	380.7	-2.8	4.55	4.162	clear, NO, NS
15:17	1.5	6.8	6.77	369.1	-2.3	3.41	4.550	" " "
15:23	3.8	5.7	6.72	369.3	-1.5	3.28	4.855	" " "
15:27	4.0	5.5	6.75	367.5	-4.0	3.80	5.131	" " "
15:32	5.0	5.5	6.75	367.8	-4.4	3.31	5.410	" " "; slow pumping
15:37	5.7	7.3	6.77	373.2	-4.3	6.20	5.404	" " "
* Stable parameters; sample @ 15:40; finish @ 15:53 generally						→	5.524	" " "

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear X Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
BTEX/VPH/VOC	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	sodium bisulfate
L/H/PAH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	" "
chloride	☒ Plastic	☐ Glass		1						☐ Yes	☒ No	none
dissolved	☒ Plastic	☐ Glass		1						☒ Yes	☐ No	HNO_3
dMg	☐ Plastic	☒ Glass	1							☒ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

#8 containers

SCN No. 03197-06 Consumables: ☐ Waterra Tubing _____ ☒ HDPE/Teflon Tubing ~75m ☒ Groundwater Filter
Field Dup. _____ ☒ Silicon Tubing ~0.10 ☐ D.O. Ampoules _____ ☐ Footvalve

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☑ Purging/Sampling

Well No.: K19-MW17-26

Project Name: K-19 Tritch-AK Hwy
Project No.: 1657709-5000
Location: Triten BC
Date: 2017 - 29 - July
Weather: Overcast **Temperature:** ~10°C
Completed By: DK
GPS Coordinates:
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 13:10
Depth to Product: – m Product Thickness: – m
Depth to Water (A): 9.575 m below ☒ TOP
Depth to Bottom of Well (B): 11.602 m below ☒ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: – ppm
One Well Volume:
(B-A)*2.0 = 4.054 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump
☐ Waterra
☐ Hydrolift
☒ Bailer (Type: Teflon)
☒ Peristaltic
☐ Submersible
☐ Bladder

Pump Details: Geopump

Multimeter Model: YSI ProPlus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model: –
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ☐ pH7
☐ pH10
☐ 1413 us/cm
☒ Field Calibration DO, 7, 4, 10, 1413

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 12.162 litres
Avg. Flow Rate: Bailer L/min.
Start: 13:15 July 29
Finish: 09:28 July 30
Sample intake depth: Bailer / 0.75m above bottom

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
13:21	1	5.9	6.90	703.8	15.8	4.48	9.903	–
13:36 → purged dry after 4.5 L; return later this afternoon to continue purge								
July 30 09:00	sampling w/ peristaltic → purge tubing, then sample –						5.278	
09:28	–	13.5	6.80	825.0	-28.7	3.31	6.246	Sampling completed w/ peri

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I ☒ I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
BTEX/VPH/VOC	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	sodium bisulfate
L/H/PAH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	" "
chloride	☒ Plastic	☐ Glass		1						☐ Yes	☒ No	none
d. metals	☒ Plastic	☐ Glass		1						☒ Yes	☐ No	HNO3
ditto	☐ Plastic	☒ Glass	1							☒ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03763-04
Field Dup. –

Consumables: ☐ Waterra Tubing ☒ HDPE/Teflon Tubing 12.0 ☒ Groundwater Filter
☒ Silicon Tubing ~0.10 ☐ D.O. Ampoules ☐ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☒ Purging/Sampling

Well No.: K19-MW17-27

Project Name: K-19 Trutch-AK Hwy
Location: Trutch BC
Weather: sunny w/clouds **Temperature:** ~15°C
GPS Coordinates:

Project No.: 1657709-5000
Date: 2017-27-July
Completed By: DK
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 11805
Depth to Product: – m
Product Thickness: – m
Depth to Water (A): 3.654 m below ☒ TOP
Depth to Bottom of Well (B): 9.515 m below ☒ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: – ppm
One Well Volume:
(B-A)*2.0 = 11.722 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ______ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra
☐ Hydrolift
☐ Bailer (Type:__________)
☒ Peristaltic
☐ Submersible
☐ Bladder

Pump Details: Geopump

Multimeter Model: YSI Pro Plus
pH/Temp Meter Model: |
Conductivity Meter Model: |
Dissolved Oxygen Meter Model: |
ORP (Redex) Meter Model: ↓
Organic Vapour Meter Model: –
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ______ ☐ pH7 ______
☐ pH10 ______
☐ 1413 us/cm ______
☒ Field Calibration DO, 7, 4, 10, 1413

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 35.166 litres
Avg. Flow Rate: 0.1-0.3 L/min.
Start: 11820 Finish: 12824
Sample intake depth: ~0.50-0.75m above bottom

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
11:22	0.3	5.7	6.92	568.5	-3.2	2.98	3.872	slightly cloudy, NO, NS
11:27	1.7	5.3	6.60	563.8	3.1	2.39	4.498	" " " /
11:32	3.0	5.5	6.52	562.3	4.5	2.15	4.888	" " " /
11:37	4.3	5.5	6.52	560.6	3.9	1.98	5.130	clearing " /
11:42	5.8	5.2	6.53	562.9	2.8	1.94	5.401	clear, NO, NS; slow pump
11:47	6.5	7.6	6.55	561.2	-0.3	1.76	5.395	" " "
11:52	7.2	6.7	6.56	560.9	-0.5	1.74	5.411	" " "; YSI died → reca and rep batteri
12:07	10.2	6.6	6.56	516.1	-0.7	1.71	5.400	" " "

* Record DO in Mg/L, not percentage

✗ stable parameters → sample @ 12810; dtw after sample = 5.381

Comments:
Odour: ☐ Yes ☒ No If yes ______
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear ☒ I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
BTEX/VPH/VOC	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	sodium bisulfate
L/H/PAH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	" "
F2-F4	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	none
chloride	☒ Plastic	☐ Glass		1						☐ Yes	☒ No	none
d-metal	☒ Plastic	☐ Glass		1						☒ Yes	☐ No	HNO_3
dHg	☐ Plastic	☒ Glass	1							☒ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03798-02
Field Dup. –

Consumables: ☐ Waterra Tubing ______ ☒ HDPE/Teflon Tubing ~10 m ☒ Groundwater Filter
☒ Silicon Tubing ~0.1 m ☐ D.O. Ampoules ______ ☐ Footvalve

(MW-14)

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☒ Purging/Sampling Well No.: K19-MW17-28

Project Name: K-19 Tntch-AK Hwy **Project No.:** 1657709-5000
Location: Tntch BC **Date:** 2017-27-July
Weather: Overcast **Temperature:** 10-15°C **Completed By:** DK
GPS Coordinates: **Reviewed By:**

MONITORING WELL INFORMATION

Time of Measurement: 14:45
Depth to Product: — m Product Thickness: — m
Depth to Water (A): 4.941 m below ☒ TOP
Depth to Bottom of Well (B): 8.371 m below ☒ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 6.86 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = — Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type:) ☒ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: Geopump

Multimeter Model: YSI ProPlus ☐ Rental Equipment:
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model: —
☐ D.O. Ampoule

☐ Field Bump ☐ pH4 ☐ pH7 ☐ pH10 ☐ 1413 us/cm
☒ Field Calibration DO, 7, 4, 10, 1413

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 20.58 litres Start: 14:56 Finish: 15:46
Avg. Flow Rate: ~100-300mL/min/L/min. Sample intake depth: ~0.50 to 0.75 m above bottom

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
14:58	0.2	5.9	6.51	458.4	-8.9	2.18	5.299	clear, NO, NS
15:03	1.4	6.0	6.18	452.5	-7.1	1.95	5.586	" " "
15:08	2.8	5.9	6.14	452.3	-7.7	1.86	5.860	" " "
15:13	4.0	5.5	6.14	451.4	-9.2	1.83	5.998	" " " ;slow pump
15:17	4.5	7.0	6.19	454.7	-13.2	1.60	5.974	" " "
15:22	5.0	6.4	6.17	456.3	-13.0	1.56	5.975	" " "
15:27	5.8	6.3	6.17	458.6	-14.6	1.55	5.980	" " "
* Parameters stable, sampling @ 15:28; finished @ 15:34 →							5.998	" " "

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear |||||||||||||||||||||||||||||||| Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
BTEX/VPH/VOC	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	sodium bisulphate
L/H/PAH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	" "
F_2-F_4	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	None
chloride	☒ Plastic	☐ Glass		1						☐ Yes	☒ No	"
d. metals	☒ Plastic	☐ Glass		1						☒ Yes	☐ No	HNO_3
O&G	☐ Plastic	☒ Glass	1							☒ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

* 10 bottles

SCN No. 03708-03 Consumables: ☐ Waterra Tubing ☒ HDPE/Teflon Tubing ~8.75m ☒ Groundwater Filter
Field Dup. — ☒ Silicon Tubing ~0.10 ☐ D.O. Ampoules ☐ Footvalve

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☑ Purging/Sampling

Well No.: K19-MW17-29D

Project Name: K19 - PWGSC Aleska Hwy
Project No.: 1457709-5000
Location: K19
Date: 28/07/15
Weather: Sunny **Temperature:** ~15°C
Completed By: DK
GPS Coordinates:
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 16:20
Depth to Product: — m Product Thickness: — m
Depth to Water (A): 4.900 m below ☑ TOP
Depth to Bottom of Well (B): 9.040 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good

Tidally Influenced: ☐ Yes ☑ No
Pressurized: ☐ Yes ☑ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 8.48 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type: ____) ☑ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: Geopump

Multimeter Model: YSI Pro Plus ☐ Rental Equipment:
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model: —
☐ D.O. Ampoule

☐ Field Bump
☐ pH4 ____ ☐ pH7 ____
☐ pH10 ____
☐ 1413 us/cm ____
☑ Field Calibration DO, 7, 4, 10, 1413

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 25.44 litres
Avg. Flow Rate: ____ L/min.
Start: 16:24 Finish: 17:04
Sample intake depth: ~0.75m above bottom

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	Water Level (m)	Remarks
16:26	0.3	7.2	6.50	861	-27.7	1.43	5.076	cloudy, NO, NS
16:31	1.8	7.9	6.45	850	-29.6	1.30	5.228	clearing " "
16:36	2.5	7.7	6.48	856	-36.1	1.29	5.269	" " "
16:41	3.3	7.4	6.51	857	-36.3	1.30	5.319	" " "
* Stable parameters; sampling @ 16:45; finish @ 17:04							5.331	NO, NS

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☑ No If yes ____
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I ☒ I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
BTEX/VPH/VOC	☐ Plastic	☑ Glass	3							☐ Yes	☑ No	Sodium bisulfate
L/H/PAH	☐ Plastic	☑ Glass			2					☐ Yes	☑ No	" "
chloride	☑ Plastic	☐ Glass		1						☐ Yes	☑ No	none
2 metals	☑ Plastic	☐ Glass		1						☑ Yes	☐ No	HNO_3
2 Hg	☐ Plastic	☑ Glass	1							☑ Yes	☐ No	HCl
F_2 - F_4	☐ Plastic	☑ Glass			2					☐ Yes	☑ No	none
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

* 10 cm

SCN No. 03762-07 Consumables: ☐ Waterra Tubing ____ ☑ HDPE/Teflon Tubing ~9.5m ☑ Groundwater Filter
Field Dup. ____ ☑ Silicon Tubing ~0.5m ☐ D.O. Ampoules ____ ☐ Footvalve

Golder Associates

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☒ Development
☒ Purging/Sampling

Well No.: K19-MW ~~[illegible]~~ 17-225

Project Name: K-19 Tritch-AK Hwy
Project No.: 1657709-5000
Location: Triten BC
Date: 2017 - ~~07~~ - ~~18~~ 29-July
Weather: ~~[illegible]~~ Sunny
Temperature: ~~[illegible]~~ ~15-20°C
Completed By: ~~[illegible]~~ DK
GPS Coordinates:
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: ~~[illegible]~~ 09:55
Depth to Product: 4.372 — m
Product Thickness: — m
Depth to Water (A): ~~[illegible]~~ m below ☑ TOP
Depth to Bottom of Well (B): 4.79 ~~[illegible]~~ m below ☒ TOP
Diameter of Standpipe: 51 mm
Well Condition: new 2" ~~[illegible]~~ flushmount
Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 0.728 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump
☐ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☒ Peristaltic
☐ Submersible
☐ Bladder

Pump Details: Geopump

Multimeter Model: YSI Pro Plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model: —
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4
☐ pH7
☐ pH10
☐ 1413 us/cm
☒ Field Calibration DO, 7, 4, 10, 1413

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 2.184 litres
Start: 10:05
Finish: 10:32
Avg. Flow Rate: L/min.
Sample intake depth: ~0.10 m above bottom

Date
~~Project~~

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. (µS/cm) or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
~~1448~~	~~8~~						~~dry~~	~~Very silty~~
* sample immediately → no purge								
10:05		12.9	6.49	13090	7.7	4.41	—	silty NO, NS
finish sampling @ 10:11 due to well drying out; wait for recharge to collect remaining samples								
* collect remaining samples ~10:25								

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I ☒ I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
BTEX/VPH/VOC	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	Sodium bisulfate
L/H/PAH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	" "
Chloride	☒ Plastic	☐ Glass		1						☐ Yes	☒ No	none
d. metals	☒ Plastic	☐ Glass		1						☒ Yes	☐ No	HNO3
d. Hg	☐ Plastic	☒ Glass	1							☒ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

#8 containers

SCN No. 03763-05
Field Dup. —
Consumables: ☐ Waterra Tubing ☐ HDPE/Teflon Tubing ~8 ☐ Groundwater Filter
☒ Silicon Tubing ~0.10 ☐ D.O. Ampoules ☐ Footvalve

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GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☒ Purging/Sampling Well No.: K19-MW17-80

Project Name: K19 - Tratch - AK Highway **Project No.:** 1657709 15000
Location: Tratch, BC **Date:** July 28, 2017
Weather: sunny / clouds **Temperature:** ~15°C **Completed By:** DK
GPS Coordinates: **Reviewed By:**

MONITORING WELL INFORMATION

Time of Measurement: 09:40
Depth to Product: - m Product Thickness: ~ m
Depth to Water (A): 4.878 m below ☒ TOP
Depth to Bottom of Well (B): 9.476 m below ☐ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: - ppm
One Well Volume:
(B-A)*2.0 = 9.196 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = _____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type:_____) ☒ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: Geopump

Multimeter Model: YSI Pro Plus ☐ Rental Equipment:
pH/Temp Meter Model:
Conductivity Meter Model: ☐ Field Bump
Dissolved Oxygen Meter Model: ☐ pH4 _____ ☐ pH7 _____
ORP (Redex) Meter Model: ☐ pH10 _____
Organic Vapour Meter Model: ☐ 1413 us/cm _____
☐ D.O. Ampoule ☒ Field Calibration DO, 7, 4, 10, Cond.

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 27.588 litres Start: 09:50 Finish: _____
Avg. Flow Rate: _____ L/min. Sample intake depth: _____

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	Water Level (m)	Remarks
09:52	0.2	4.8	7.05	423.8	-42.7	4.15	5.160	clear, NO, NS
09:57	1.9	5.0	6.78	420.3	-28.7	3.33	5.630	slow pump speed
10:02	3.9	4.9	6.76	418.2	-25.4	3.17	5.870	clear, NO, NS
10:07	3.8	4.9	6.77	416.3	-23.4	3.05	6.190	" " "
10:12	4.8	4.9	6.77	415.1	-21.8	2.98	6.470	metallic-like sheen, increase pump r
10:18	5.9	4.7	6.79	414.6	-21.6	3.05	6.780	" " "
10:23	6.9	4.7	6.82	414.3	-21.9	3.01	7.051	" " "
10:28	8.0	4.5	6.84	413.3	-22.3	3.14	7.379	" " "

* Record DO in Mg/L, not percentage ↓ see reverse

Comments:
Odour: ☐ Yes ☒ No If yes _____
Sheen: ☒ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☒ Metallic-like
Turbidity: Clear X Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
BTEX/F1/PHC/MC	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	Sodium bisulfate
Glycols	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	" "
L/M/PAH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	" "
chloride	☒ Plastic	☐ Glass		1						☐ Yes	☒ No	none
d. metals	☒ Plastic	☐ Glass		1						☒ Yes	☐ No	HNO_3
d. Hg	☐ Plastic	☒ Glass	1							☒ Yes	☐ No	HCl
F_2-F_4	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	none

SCN No. 03762-01 Consumables: ☐ Waterra Tubing _____ ☒ HDPE/Teflon Tubing ~10 m ☒ Groundwater Filter
Field Dup. - ☒ Silicon Tubing 0.10 ☐ D.O. Ampoules _____ ☐ Footvalve

* 13 containers

Time	Vol	Temp	pH	Cond.	ORP	DO	H_2O level	Remarks
10:34	9.5	4.8	6.87	419.9	-21.3	3.71	7.724	
10:40	10.8	4.8	6.89	411.1	-20.8	3.32	7.990	slow pump rate
10:45	11.1	5.9	6.92	417.9	-23.7	3.13	7.982	
10:50	11.5	6.1	6.91	414.6	-23.4	2.95	7.975	✱ stable & prep. to sample

* sampling @ 10:51

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☒ Purging/Sampling

Well No.: K19-MW17-31

Project Name: K19 - Alaska Hwy.
Location: K19 - Trutch, BC
Weather: Sunny w/ clouds **Temperature:** ~15°C
GPS Coordinates:

Project No.: 1657709 (5000)
Date: 29/07/15
Completed By: DK
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 09:20
Depth to Product: — m Product Thickness: — m
Depth to Water (A): 2.398 m below ☒ TOP
Depth to Bottom of Well (B): 7.442 m below ☒ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 10.088 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = _____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump
☐ Waterra
☐ Hydrolift
☐ Bailer (Type: _____)
☒ Peristaltic
☐ Submersible
☐ Bladder
Pump Details: Geopump

Multimeter Model: YSI ProPlus ☐ Rental Equipment:
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Field Bump
☐ pH4 _____ ☐ pH7 _____
☐ pH10 _____
☐ 1413 us/cm _____
☒ Field Calibration DO, 7, 4, 10

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 30.264 litres
Avg. Flow Rate: _____ L/min.

Start: 09:25 Finish: _____
Sample intake depth: ~0.50-0.75m above bottom

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. (µS/cm or mS/cm *circle one*)	Redox (mV)	Diss. O_2* (mg/L)	Water Level (m)	Remarks
09:28	0.3	5.0	7.04	469.9	-2.5	7.15	2.653	clear, NO, NS
09:33	1.8	5.1	6.90	461.4	1.0	5.62	2.969	" " "
09:38	3.0	5.3	6.89	459.9	-3.6	4.76	3.495	" " "
09:43	4.5						4.001	" " "
09:48	5.9	4.4	6.92	457.4	-9.5	4.81	4.570	" " "
09:56	8.1	4.8	6.96	458.5	-18.1	4.32	5.542	" " "
10:01	9.5	4.9	7.02	455.5	-17.0	4.10	5.976	slow pump
10:06	9.9	7.6	7.03	461.3	-20.6	3.76	6.034	clear

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear |X| Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
BTEX/PHC	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	sodium bisulfate
L/H/PAH	☐ Plastic	☒ Glass	3		2					☐ Yes	☒ No	" "
Glycols	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	" "
Chloride	☒ Plastic	☐ Glass		1						☐ Yes	☒ No	none
Dissolved Metals	☒ Plastic	☐ Glass		1						☒ Yes	☐ No	HNO3
DHg	☐ Plastic	☒ Glass	1							☒ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

*11 containers

SCN No. 03752-02
Field Dup. —

Consumables: ☐ Waterra Tubing _____ ☒ HDPE/Teflon Tubing ~8m ☒ Groundwater Filter
☒ Silicon Tubing ~0.1m ☐ D.O. Ampoules _____ ☐ Footvalve

Golder Associates

Time	Vol.	Temp	pH	Cond.	ORP	DO	H_2O level	Remarks
10:11	10.3	7.7	7.05	459.3	-28.9	3.42	6.091	clear
10:16	10.8	7.5	7.10	466.2	-24.2	3.69	6.140	"
10:21	11.3	7.4	7.14	469.9	-22.6	3.76	6.214	"
10:26	12.0	7.6	7.19	473.5	-22.5	3.63	6.254	"

* Generally stable → sampling @ 10:27, finish @ 10:16 → 6.395

(MW-19)

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☒ Purging/Sampling

Well No.: K19-MW17-32

Project Name: K-19 Tritch-AK Hwy
Location: Triten Bc
Weather: Overcast **Temperature:** 10°C
GPS Coordinates:
Project No.: 1657709-5000
Date: 2017 - 27 - July
Completed By: DK
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 1606
Depth to Product: - m
Product Thickness: - m
Depth to Water (A): 2.382 m below ☒ TOP
Depth to Bottom of Well (B): 5.855 m below ☒ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good
Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: - ppm
One Well Volume:
(B-A)*2.0 = 6.046 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump
☐ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☒ Peristaltic
☐ Submersible
☐ Bladder

Pump Details: Geopump

Multimeter Model: YSI Pro Plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model: -
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4
☐ pH7
☐ pH10
☐ 1413 us/cm
☒ Field Calibration DO, 7, 4, 10, 1413

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 18.138 litres
Avg. Flow Rate: L/min.
Start: 16:11 Finish: 17:33
Sample intake depth: ~0.50-0.75m above bottom

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
16:12	0.2	7.2	7.08	678.5	20.0	8.43	2.625	clear, NO, NS
16:17	1.2	7.2	7.02	676.1	19.6	8.68	2.931	" " "
16:22	2.3	7.0	7.03	675.5	18.8	8.56	3.301	" " "
16:27	3.2	7.0	7.04	674.7	16.8	8.23	3.636	" " "
16:32	4.1	7.0	7.05	675.8	14.2	8.16	3.879	" " "
16:37	5.5	6.6	7.06	675.9	11.1	8.16	4.201	" " "
16:42	6.6	6.4	7.07	675.6	7.8	8.10	4.402	" " "
16:46	7.5	7.1	7.07	680.3	4.5	7.00	4.398	" " "

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☐ No If yes
Sheen: ☐ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No.
Field Dup.
Consumables: ☐ Waterra Tubing ☐ Silicon Tubing ☐ HDPE/Teflon Tubing ☐ D.O. Ampoules ☐ Groundwater Filter ☐ Footvalve

1/2

(MW-19)

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☑ Purging/Sampling

Well No.: K19-MW19-32

Project Name: K-19 Tntch-AK Hwy
Location: Tntch BC
Weather: _____ **Temperature:** _____
GPS Coordinates: _____

Project No.: 1657709-5000
Date: 2017 - -
Completed By: _____
Reviewed By: _____

MONITORING WELL INFORMATION

Time of Measurement: _____
Depth to Product: _____ m Product Thickness: _____ m
Depth to Water (A): _____ m below ☐ TOP
Depth to Bottom of Well (B): _____ m below ☐ TOP
Diameter of Standpipe: _____ mm
Well Condition: _____

Tidally Influenced: ☐ Yes ☐ No
Pressurized: ☐ Yes ☐ No
Well Headspace: _____ ppm
One Well Volume:
(B-A)*2.0 = _____ Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = _____ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type: _____) ☐ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: _____

Multimeter Model: _____ ☐ Rental Equipment:
pH/Temp Meter Model: _____
Conductivity Meter Model: _____ ☐ Field Bump
Dissolved Oxygen Meter Model: _____ ☐ pH4 _____ ☐ pH7 _____
ORP (Redex) Meter Model: _____ ☐ pH10 _____
Organic Vapour Meter Model: _____ ☐ 1413 us/cm _____
☐ D.O. Ampoule ☐ Field Calibration _____

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X _____ = _____ litres Start: _____ Finish: _____
Avg. Flow Rate: _____ L/min. Sample intake depth: _____

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☐ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
16:51	8.7	7.5	7.07	684.4	-11.0	5.51	4.480	clear, NO, NS
16:56	9.5	7.8	7.09	691.7	-7.8	6.19	4.478	" " "
17:00	10	7.0	7.10	696.1	-8.1	6.14	4.540	" " "
17:05	10.5	7.7	7.11	693.4	-9.8	6.12	4.580	" " "
* Parameters generally stable, sampling @ 17:05 finish @ 17:33								

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes _____
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear |||||||||||||||||||||||||||||||||||| Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
BTEX/VPH/MeOH	☐ Plastic	☒ Glass	2x3							☐ Yes	☒ No	sodium bisulfate
L/H/PAH	☐ Plastic	☒ Glass			2x2					☐ Yes	☒ No	" "
Chloride	☒ Plastic	☐ Glass		2x1						☐ Yes	☒ No	none
metals	☒ Plastic	☐ Glass		2x1						☒ Yes	☐ No	HNO_3
& Hg	☐ Plastic	☒ Glass	2x1							☒ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03798-04
Field Dup. 03798-05

Consumables: ☐ Waterra Tubing _____ ☒ HDPE/Teflon Tubing ~6 ☒ Groundwater Filter
☒ Silicon Tubing ~0.10 ☐ D.O. Ampoules _____ ☐ Footvalve

* each of 2

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☒ Purging/Sampling

Well No.: K19-MW07-35

Project Name:	K19 Alaska Highway	**Project No.:**	1657709 15000
Location:	K19	**Date:**	28/07/15
Weather:	overcast **Temperature:** ~15°C	**Completed By:**	DK
GPS Coordinates:		**Reviewed By:**	

MONITORING WELL INFORMATION

Time of Measurement: 13:53
Depth to Product: — m Product Thickness: — m
Depth to Water (A): 4.269 m below ☒ TOP
Depth to Bottom of Well (B): 5.790 m below ☑ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 3.0 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ______ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra
☐ Hydrolift
☐ Bailer (Type: ______)
☒ Peristaltic
☐ Submersible
☐ Bladder

Pump Details: Geopump

Multimeter Model: YSI Pro Plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model: —
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ☐ pH7
☐ pH10
☐ 1413 us/cm
☒ Field Calibration DO, 7, 4, 10, 1413

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 9.13 litres
Avg. Flow Rate: ______ L/min.
Start: 13:59 Finish: 14:51
Sample intake depth: ~0.50-0.75m above bottom

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	Water Level (m)	Remarks
14:01	0.0	6.0	6.61	347.3	-3.2	3.44	4.315	clear, NO, NS
14:06	1.7	6.1	6.36	345.3	1.1	2.74	4.437	" " "
14:12	2.5	6.9	6.34	340.8	-0.8	2.97	4.526	" " "
14:17	3.0	6.7	6.39	341.5	-2.1	3.10	4.591	" " "
14:22	4.0	6.6	6.40	334.8	-2.5	3.16	4.698	" " "
* Generally stable -> sampling @ 14:24; 14:51: sampling complete								

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☐ No If yes ______
Sheen: ☐ Yes ☐ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
BTEX/VPH/VOC	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	sodium bisulfate
Glycols	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	" "
L/H/PAH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	" "
Chloride	☒ Plastic	☐ Glass		1						☐ Yes	☒ No	none
d. Metals	☒ Plastic	☐ Glass		1						☒ Yes	☐ No	HNO_3
d. Hg	☐ Plastic	☒ Glass	1							☒ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

* 11

SCN No. 03762-05
Field Dup. —

Consumables: ☐ Waterra Tubing ______ ☒ HDPE/Teflon Tubing ~6m ☒ Groundwater Filter
☒ Silicon Tubing ~0.10m ☐ D.O. Ampoules ______ ☐ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☒ Purging/Sampling
Well No.: K19-MW15-34

Project Name: K19 - PWGSC Alaska Hwy
Location: K19
Weather: Overcast **Temperature:** ~15°C
GPS Coordinates:
Project No.: 1657709/5000
Date: 28/07/15
Completed By: D McCamner
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 14:57
Depth to Product: – m Product Thickness: – m
Depth to Water (A): 3.899 m below ☒ TOP
Depth to Bottom of Well (B): 7.353 m below ☒ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good
Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: – ppm
One Well Volume:
(B-A)*2.0 = 6.908 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra
☐ Hydrolift
☐ Bailer (Type:)
☒ Peristaltic
☐ Submersible
☐ Bladder
Pump Details: Geo pump

Multimeter Model: YSI Pro Plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redox) Meter Model:
Organic Vapour Meter Model: –
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ☐ pH7
☐ pH10
☐ 1413 us/cm
☒ Field Calibration 7, 4, 10, 10, 1418

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 20.724 litres
Avg. Flow Rate: ~100-200ml/min ~~L/min.~~
Start: 15:00 Finish: 15:52
Sample intake depth: ~0.50-0.75m above bottom

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O₂* (mg/L)	Water Level (m)	Remarks
15:05	0.7	6.6	6.66	381.1	2.1	3.38	4.101	cloudy, NO, NS
15:10	1.8	6.4	6.54	373.3	-0.9	3.50	4.410	" " "
15:15	2.8	6.5	6.52	373.5	-3.4	3.07	4.728	" " "
15:20	3.6	6.4	6.54	373.8	-6.4	2.81	4.952	clearing " "
15:25	4.1	7.6	6.58	373.6	-10.4	2.43	5.053	clear " "
15:30	4.8	8.1	6.58	374.7	-11.4	2.28	5.051	" " "
15:35	5.3	7.7	6.56	374.8	-12.4	2.32	5.098	" " "
✓ Generally stable; sampling @ 15:37; finish @ 15:52							5.221	" " "

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
BTEX/VPH/VOC	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	sodium bisulfate
L/H/PAH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	" "
chloride	☒ Plastic	☐ Glass		1						☐ Yes	☒ No	none
d metal	☒ Plastic	☐ Glass		1						☒ Yes	☐ No	HNO3
d Hg	☐ Plastic	☒ Glass	1							☒ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

*8 containers

SCN No. 03762-06
Field Dup. –
Consumables: ☐ Waterra Tubing ☒ HDPE/Teflon Tubing ~8 m ☒ Groundwater Filter
☒ Silicon Tubing ~0.1m ☐ D.O. Ampoules ☐ Footvalve

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GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development
☒ Purging/Sampling

Well No.: K19-MW17-3SD

Project Name: K19 - Alaska Hwy
Location: K19
Weather: Rain **Temperature:** ~10°C
GPS Coordinates:

Project No.: 1657709/5000
Date: 29/07/15
Completed By: DK
Reviewed By:

MONITORING WELL INFORMATION

Time of Measurement: 11:35
Depth to Product: – m
Product Thickness: – m
Depth to Water (A): 3.750 m below ☒ TOP
Depth to Bottom of Well (B): 7.657 m below ☒ TOP
Diameter of Standpipe: 51 mm
Well Condition: Good - Flushmount

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: – ppm
One Well Volume:
(B-A)*2.0 = ______ Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = ______ Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra
☐ Hydrolift
☐ Bailer (Type: ______)
☒ Peristaltic
☐ Submersible
☐ Bladder

Pump Details: Geopump

Multimeter Model: YSI Pro Plus
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model: –
☐ D.O. Ampoule

☐ Rental Equipment:
☐ Field Bump
☐ pH4 ☐ pH7
☐ pH10
☐ 1413 us/cm
☒ Field Calibration DO, 7, 4, 10, 1413

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X ______ = ______ litres
Avg. Flow Rate: ~200 mL/min [✓ L/min.]
Start: 11:37 Finish: 12:05
Sample intake depth: ~0.75m

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	Water Level (m)	Remarks
11:41	0.8	7.3	6.62	498.4	-87.1	0.54	3.790	strong HC-like odour
11:46	2.0	7.0	6.60	500.5	-88.1	0.57	3.792	~~M~~ Metallic/HC-like sheen
11:52	2.8	6.7	6.58	493.6	-92.5	0.54	3.796	" "
11:57	3.8	6.7	6.57	491.6	-95.3	0.57	3.796	" "
12:03	4.9	6.5	6.58	490.9	-98.4	0.59	3.797	" "
* Stable → sampling @ 12:05				→			3.796	* end of sampling @ 1284

* Record DO in Mg/L, not percentage

Comments:
Odour: ☒ Yes ☐ No If yes HC-like
Sheen: ☒ Yes ☐ No If yes ☒ Hydrocarbon-like OR ☒ Metallic-like
Turbidity: Clear I ☒ I I I I I I I I I I I I I I I I I I I I I I I I I I I I I Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
BTEX/VPH/VOC	☐ Plastic	☒ Glass	3x2							☐ Yes	☒ No	sodium bisulfate
L/H/PAH	☐ Plastic	☒ Glass			2x2					☐ Yes	☒ No	" "
F2-F4	☐ Plastic	☒ Glass			2x2					☐ Yes	☒ No	none
Chloride	☒ Plastic	☐ Glass		2x1						☐ Yes	☒ No	none
d. metals	☒ Plastic	☐ Glass		2x1						☒ Yes	☐ No	HNO3
d. Hg	☐ Plastic	☒ Glass	2x1							☒ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03763-01
Field Dup. 03763-02

Consumables: ☐ Waterra Tubing ______ ☒ HDPE/Teflon Tubing ~8 ______ ☒ Groundwater Filter
☒ Silicon Tubing ~0.1 ☐ D.O. Ampoules ______ ☐ Footvalve

GROUNDWATER DEVELOPMENT AND SAMPLING DATA

☐ Development ☒ Purging/Sampling Well No.: K19-MW17-355

Project Name: K-19 Tutch-AK Hwy **Project No.:** 1657709-5000
Location: Tutch BC **Date:** 2017-29-July
Weather: Overcast **Temperature:** ~10-15 **Completed By:** DK
GPS Coordinates: **Reviewed By:**

MONITORING WELL INFORMATION

Time of Measurement: 14:10
Depth to Product: — m Product Thickness: — m
Depth to Water (A): 4.181 m below ☐ TOP
Depth to Bottom of Well (B): 4.925 m below ☒ TOP
Diameter of Standpipe: 51 mm
Well Condition: Flushmount

Tidally Influenced: ☐ Yes ☒ No
Pressurized: ☐ Yes ☒ No
Well Headspace: — ppm
One Well Volume:
(B-A)*2.0 = 1.5 Litres - for a 51 mm (2.0 inch) diameter well
(B-A)*1.1 = — Litres - for a 38 mm (1.5 inch) diameter well

EQUIPMENT LIST

Pump ☐ Waterra ☐ Hydrolift ☐ Bailer (Type:) ☒ Peristaltic ☐ Submersible ☐ Bladder
Pump Details: Geopump

Multimeter Model: YSI ProPlus ☐ Rental Equipment:
pH/Temp Meter Model:
Conductivity Meter Model:
Dissolved Oxygen Meter Model:
ORP (Redex) Meter Model:
Organic Vapour Meter Model:
☐ D.O. Ampoule

☐ Field Bump ☐ pH4 ☐ pH7 ☐ pH10 ☐ 1413 us/cm
☒ Field Calibration DO, 7, 4, 10, 14R

WELL DEVELOPMENT/PURGING

Purge Volume: Well. Vol. X 3 = 4.464 litres
Avg. Flow Rate: L/min.
Start: 14:14 July 29 Finish: 11:25 July 30
Sample intake depth: * tubing set low @ ~0.25m above bottom

Date

Time	Volume Removed (L)	Temp. (°C)	pH (Units)	☒ Cond. ☐ Specific Cond. µS/cm or mS/cm (circle one)	Redox (mV)	Diss. O_2* (mg/L)	DTW Water Level (m)	Remarks
14:16	0.2	9.1	6.50	215.8	57.6	6.89	4.240	slightly cloudy, NO, NS
14:21	0.8	9.9	6.01	205.9	63.4	6.86	4.332	clearing, NO, NS
14:26	1.8	9.8	5.84	181.8	74.2	7.28	4.420	clear, NO, NS
14:34	2.5	9.5	5.92	216.4	68.9	6.82	4.591	" " "
14:39							4.601	lower tubing to purge drg
14:40	3.0	12.7	6.06	246.2	57.5		4.651	
14:52	4.0	9.1	6.19	308.3	45.3	5.18	4.794	
15:50	5.0						Drg	* purged drg, sample tomorrow

July 30 * Sampling @ 10:50 pH 6.20 @ 8.760 → pH 6.16 Cond 292.4 µS/cm ORP 29.2 mV DO 11.97 mg/L 4.584 m * finished @ 11:25

* Record DO in Mg/L, not percentage

Comments:
Odour: ☐ Yes ☒ No If yes
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear |||||||||||||||||||||||||||||||||||| Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
BTEX/VPH/VOC	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	sodium bisulfate
L/H/PAH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	" "
F2-F4	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	" "
chloride	☒ Plastic	☐ Glass		1						☐ Yes	☒ No	none
d. metal	☒ Plastic	☐ Glass		1						☐ Yes	☒ No	none
d. Hg	☐ Plastic	☒ Glass	1							☒ Yes	☐ No	HNO_3
	☐ Plastic	☐ Glass								☒ Yes	☐ No	HCl
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 03763-06 Consumables: ☐ Waterra Tubing ☒ HDPE/Teflon Tubing ~5.25 ☒ Groundwater Filter
Field Dup. — ☐ Silicon Tubing ~0.1m ☐ D.O. Ampoules ☐ Footvalve

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APPENDIX F

Surface Water Sampling Field Forms

SURFACE WATER SAMPLING DATA

SAMPLE NO.: K19-SW17-01

Project Name: K-19 | Project No.: 1657709-5000

Location: K-19 Truten Bc ; Wetland C | Date: 19/07/17 | Time: 09:40

Weather: ~Sunny w/clouds | Temperature: ~15°C | Completed By: D. Klammer

GPS Coordinates: | Reviewed By:

EQUIPMENT LIST

Multimeter	Model: YSI ProPlus	☐	Rental Equipment:	
pH/Temp Meter	Model:			
Conductivity Meter	Model:	☐	Field Bump	
Dissolved Oxygen Meter	Model:	☐	pH4	☐ pH7
ORP (Redex) Meter	Model:	☐	pH10	
Organic Vapour Meter	Model: -	☐	1413 us/cm	
☐ D.O. Ampoule		☒	Field Calibration	DO, pH 7, 4, 10, Conductivity

STATION INFORMATION

Aquatic Environment: ☒ Fresh ☐ Marine ☐ Estuarine Photograph No.(s):

Co-Located Sample(s): 1 Type (sediment): SS17-03 ID:

SURFACE WATER SAMPLING

Method of Sample Collection: ☒ Grab ☐ Pump ☐ Other:

Flow

Method: ☐ Flow Meter Model:

☐ Velocity Head Rod (ruler):

☐ Velocity m/s Water Depth ~0.60 - 0.70 cm

Time	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. µS/cm or mS/cm (circle one)	TDS (g/L)	Redox (ORP)	Diss. O_2 (mg/L) or (%)	Sal (ppt)	Remarks
09:45	13.4	7.06	287.3	0.1865	-12.0	1.80	0.14	standing H_2O; clear to brown
09:50	13.5	7.22	282.1	0.1838	-4.5	1.64	0.14	" " " " "
09:55	13.5	7.27	282.3	0.1833	-4.3	1.61	0.14	" " " " "

Comments:

Odour: ☐ Yes ☒ No If yes

Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like

Turbidity: Clear |||X||||||||||||||||||||||||| Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
BTEX/VPH/F1/VOC	☐ Plastic	☒ Glass	3xAmber							☐ Yes	☒ No	sodium bisulfate
F2-F4	☐ Plastic	☒ Glass			2					☐ Yes	☐ No	none
LEPH/HEPH/PAH	☐ Plastic	☒ Glass			2					☐ Yes	☐ No	sodium bisulfate
Glycols	☒ Plastic	☐ Glass	3							☐ Yes	☐ No	" "
dissolved metals/dissolved	☒ Plastic	☒ Glass	1	1						☒ Yes	☐ No	nitric / HCl
total metals/total	☒ Plastic	☒ Glass	1	1						☐ Yes	☒ No	" / "
chloride	☒ Plastic	☐ Glass		1						☐ Yes	☐ No	none

SCN No. 03814-01 Consumables: ☒ Syringes / Filters 1 / 4 ☐ Other

Field Dup. -

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SURFACE WATER SAMPLING DATA

SAMPLE NO.: K19-SW17-02

Project Name: K-19 | Project No.: 1657709-5000
Location: K-19 Truten BC | Date: July 19/17 | Time: 10:30
Weather: Sunny | Temperature: 15°C | Completed By: AW/DK
GPS Coordinates: | Reviewed By:

EQUIPMENT LIST

YSI PRO PLUS

Multimeter	Model:	BUR 1429G2	☐	Rental Equipment:
pH/Temp Meter	Model:			
Conductivity Meter	Model:		☐	Field Bump
Dissolved Oxygen Meter	Model:		☐	pH4 ☐ pH7
ORP (Redex) Meter	Model:		☐	pH10
Organic Vapour Meter	Model:		☐	1413 us/cm
☐ D.O. Ampoule			☑	Field Calibration DK

STATION INFORMATION

Aquatic Environment: ☑ Fresh ☐ Marine ☐ Estuarine Photograph No.(s):
Co-Located Sample(s): Type (sediment): [redacted] ID: K19-SS17-01

SURFACE WATER SAMPLING

Method of Sample Collection: ☑ Grab ☑ Pump ☐ Other:

Flow

Both! → pump needed for filtered samples.

Method: ☐ Flow Meter Model:
☐ Velocity Head Rod (ruler):
☐ Velocity m/s Water Depth cm

Time	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. µS/cm or mS/cm (circle one)	TDS (g/L)	Redox (ORP)	Diss. O_2 (mg/L) or (%)	Sal (ppt)	Remarks
10:35	16.5	6.83	261.9	0.1697	-157.2	4.96	0.13	
10:44	17.2	6.87	259.9	0.1690	179.8	3.13	0.12	
10:55	17.1	6.93	259.8	0.1690	-184.9	4.22	0.12	

Comments:

Odour: ☐ Yes ☑ No If yes
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear |||||||||||||||||||(1)||||||| Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
Diss metal	☐ Plastic	☐ Glass	3	1						☑ Yes	☐ No	HNO3 (flow through pump
Diss mercury	☐ Plastic	☐ Glass	1							☑ Yes	☐ No	HCl (syringe filters, cl
Tot metal	☐ Plastic	☐ Glass		1						☐ Yes	☐ No	HNO_3
Diss mercury	☐ Plastic	☐ Glass	1							☐ Yes	☐ No	HCl
PAH	☐ Plastic	☐ Glass								☐ Yes	☐ No	✓
VPH	☐ Plastic	☐ Glass								☐ Yes	☐ No	✓
Chloride	☐ Plastic	☐ Glass								☐ Yes	☐ No	no

SCN No. 381402 Consumables: ☑ Syringes / Filters ☐ Other
Field Dup.

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SURFACE WATER SAMPLING DATA

SAMPLE NO.: K19-SW17-03

Project Name: K-19 | Project No.: 1657709-5000

Location: K-19 Truten BC ; Wetland C | Date: 19/07/17 | Time: 1030

Weather: Sunny | Temperature: ~15°C | Completed By: D. Klemmer

GPS Coordinates: 10V 0502357 6399061 | Reviewed By:

EQUIPMENT LIST

Multimeter	Model: YSI Pro Plus	☐	Rental Equipment:	–
pH/Temp Meter	Model:			
Conductivity Meter	Model:	☐	Field Bump	–
Dissolved Oxygen Meter	Model:		☐ pH4	☐ pH7
ORP (Redex) Meter	Model:		☐ pH10	–
Organic Vapour Meter	Model:		☐ 1413 us/cm	–
☐ D.O. Ampoule		☑	Field Calibration	DO (%), pH 7, 4, 10, conductivity

STATION INFORMATION

Aquatic Environment: ☑ Fresh ☐ Marine ☐ Estuarine Photograph No.(s):

Co-Located Sample(s): | Type (sediment): SS17-02 ID:

SURFACE WATER SAMPLING

Method of Sample Collection: ☑ Grab ☒ Pump ☐ Other: *pump for dissolved

Flow

Method: ☐ Flow Meter Model: ☐ Velocity Head Rod (ruler): ☒ Velocity Standing m/s Water Depth ~0.10-0.15 cm

Time	Temp. (°C)	pH (Units)	☐ Cond. ☒ Specific Cond. µS/cm or mS/cm (circle one)	TDS (g/L)	Redox (ORP)	Diss. O_2 (mg/L) or (%)	Sal (ppt)	Remarks
10:35	13.2	7.20	321.3	0.2087	4.9	0.69	0.15	silty ; NO
10:40	13.2	7.29	321.8	0.2093	5.5	0.59	0.15	" "
10:45	13.1	7.29	322.9	0.2100	6.0	0.52	0.16	" "

Comments:

Odour: ☐ Yes ☑ No If yes

Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like

Turbidity: Clear |||||||||||||||||X||||||||||| Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
BTEX/VPH	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	sodium bisulfate
LEPH/HEPH/PAH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	none
dissolved Hg	☒ Plastic	☒ Glass	1	1						☒ Yes	☐ No	nitric / HCl
dimethyl Hg	☒ Plastic	☒ Glass	1	1						☐ Yes	☒ No	" "
chloride	☒ Plastic	☐ Glass		1						☐ Yes	☒ No	none
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 02814-03 Consumables: ☒ Syringes / Filters 1 / 3 ☒ Other 1 waterra filter

Field Dup. –

SURFACE WATER SAMPLING DATA

SAMPLE NO.: K19-SW17-04

Project Name: K-19 | Project No.: 1657709-5000
Location: K-19 Truten BC | Date: July 14 2017 | Time: 11:30
Weather: Sunny | Temperature: 18°C | Completed By: AW / DK
GPS Coordinates: | Reviewed By:

EQUIPMENT LIST

4SL PW PWS

Multimeter	Model: BUR: 142096	☐	Rental Equipment:	
pH/Temp Meter	Model:			
Conductivity Meter	Model:	☐	Field Bump	
Dissolved Oxygen Meter	Model:		☐ pH4	☐ pH7
ORP (Redex) Meter	Model:		☐ pH10	
Organic Vapour Meter	Model:		☐ 1413 us/cm	
☐ D.O. Ampoule		☑	Field Calibration: DK	

STATION INFORMATION

Aquatic Environment: ☐ Fresh ☐ Marine ☐ Estuarine | Photograph No.(s):
Co-Located Sample(s): Type (sediment): Clay | ID: K19-SS17-04

SURFACE WATER SAMPLING

Method of Sample Collection: ☐ ~~Grab~~ ☐ ~~Pump~~ ☐ Other: Pump (bullfrog) for filtered sample via terra filtered

Flow
Method: ☐ Flow Meter Model:
☐ Velocity Head Rod (ruler):
☐ Velocity _____ m/s Water Depth _____ cm

Time	Temp. (°C)	pH (Units)	☐ Cond. ☐ ~~Specific Cond.~~ (µS/cm or mS/cm (circle one))	TDS (g/L)	Redox (ORP)	Diss. O_2 (mg/L) or (%)	Sal (ppt)	Remarks
11:37	11.6	6.79	478	00312	249	1.90	0.02	
11:50	11.6	6.14	46.7	00299	32.8	1.60	0.02	
12:00	11.7	6.22	44.4	00286	42.0	1.71	0.02	

Comments:
Odour: ☐ Yes ☑ No If yes
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear | | | | | | | | | | | | | | | | | | | | | | | | | Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	
	☐ Plastic	☐ Glass								☐ Yes	☐ No	

SCN No. 3814-04 Consumables: ☐ Syringes / Filters ☐ Other
Field Dup.

SURFACE WATER SAMPLING DATA

SAMPLE NO.: K19-SW17-05

Project Name: K-19 | Project No.: 1657709-5000
Location: K-19 Truten Bc / Wetland D | Date: July 19 2017 | Time: 12:05
Weather: Sunny | Temperature: ~15°C | Completed By: AW / DK
GPS Coordinates: 10V 0503383 6979039 | Reviewed By:

EQUIPMENT LIST

Multimeter	Model: YSI Pro Plus	☐	Rental Equipment:	
pH/Temp Meter	Model:			
Conductivity Meter	Model:	☐	Field Bump	
Dissolved Oxygen Meter	Model:		☐ pH4	☐ pH7
ORP (Redex) Meter	Model:		☐ pH10	
Organic Vapour Meter	Model:		☐ 1413 us/cm	
☐ D.O. Ampoule		☒	Field Calibration	DO(%), pH 7, 4, 10, Conductivity

STATION INFORMATION

Aquatic Environment: ☒ Fresh ☐ Marine ☐ Estuarine Photograph No.(s):
Co-Located Sample(s): | Type (sediment): SS17-06 ID:

SURFACE WATER SAMPLING

Method of Sample Collection: ☑ Grab ☒ Pump ☐ Other:
* pump for filtered metals

Flow
Method: ☐ ~~Flow Meter~~ Model:
☐ ~~Velocity Head Rod~~ (ruler):
☑ Velocity Standing m/s Water Depth ~0.30 cm

Time	Temp. (°C)	pH (Units)	☐ Cond. ☐ Specific Cond. µS/cm or mS/cm (circle one)	TDS (g/L)	Redox (ORP)	Diss. O_2 (mg/L) or (%)	Sal (ppt)	Remarks
12:10	10.3	6.26	59.3	0.0383	-57.8	6.38	0.03	Silty; opaque; brown
12:15	10.1	6.09	61.6	0.0405	-91.1	6.04	0.09	" " "
12:20	10.0	6.07	59.7	0.0390	-78.9	6.04	0.03	" " "

Comments:
Odour: ☐ Yes ☒ No If yes
Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear |||||||||M||||||||||||||||| Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
BTEX/PH/F1 (VOC)	☐ Plastic	☒ Glass	6							☐ Yes	☒ No	sodium bisulfate
F2 - F4	☐ Plastic	☒ Glass			4					☐ Yes	☒ No	none
L/H/PAH	☐ Plastic	☒ Glass			4					☐ Yes	☒ No	sodium bisulfate
Glycols	☒ Plastic	☐ Glass	6							☐ Yes	☒ No	" "
d.metal/d.mercury	☒ Plastic	☒ Glass	2	2						☒ Yes	☐ No	nitric / HCl
t.metal/t.mercury	☒ Plastic	☒ Glass	2	2						☐ Yes	☒ No	nitric / HCl
chloride	☒ Plastic	☐ Glass		2						☐ Yes	☒ No	none

SCN No. 3914-05 Consumables: ☐ Syringes / Filters ☒ Other waterra filter
Field Dup. 3914-06

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Golder Associates

SURFACE WATER SAMPLING DATA

SAMPLE NO.: K19-SW17-06

Project Name: K-19 | Project No.: 1657709-5000

Location: K-19 Truten BC | Date: July 19 2017 | Time: 12:15

Weather: Sunny | Temperature: 16°C | Completed By: AW/DK

GPS Coordinates: | Reviewed By:

EQUIPMENT LIST

Multimeter	Model:	YSI ProPlus 16A 142096	☐	Rental Equipment:
pH/Temp Meter	Model:			
Conductivity Meter	Model:		☐	Field Bump
Dissolved Oxygen Meter	Model:		☐	pH4 ☐ pH7
ORP (Redex) Meter	Model:		☐	pH10
Organic Vapour Meter	Model:		☐	1413 us/cm
☐ D.O. Ampoule			☐	Field Calibration

STATION INFORMATION

Aquatic Environment: ☑ Fresh ☐ Marine ☐ Estuarine Photograph No.(s):

Co-Located Sample(s): Type (sediment): Clay ID: K19-SS17-05

SURFACE WATER SAMPLING

Method of Sample Collection: ☐ Grab ☐ Pump ☐ Other:

Flow

Method: ☐ Flow Meter Model:

☐ Velocity Head Rod (ruler):

☐ Velocity m/s Water Depth cm

Time	Temp. (°C)	pH (Units)	☐ Cond. ☐ Specific Cond. µS/cm or mS/cm (circle one)	TDS (g/L)	Redox (ORP)	Diss. O_2 (mg/L) or (%)	Sal (ppt)	Remarks
12:19	10.1	5.66	38.6	0.0253	51.7	2.08	0.02	
12:27	9.7	5.71	35.7	0.0234	53.2	2.24	0.02	
	9.9	5.74	34.5	0.0221	54.2	2.19	0.01	

Comments:

Odour: ☐ Yes ☑ No If yes

Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like

Turbidity: Clear | | | | | | | | | | | | | | | | | | | | | | | | | | Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
PAH	☐ Plastic	☐ Glass			2					☐ Yes	☑ No	✓
VPH/BTEX	☐ Plastic	☑ Glass	3							☐ Yes	☐ No	✓
Chloride	☑ Plastic	☐ Glass		1						☐ Yes	☑ No	no
~~Total Hg~~	☐ Plastic	☑ Glass	1							☐ Yes	☐ No	HCl
Total metals	☑ Plastic	☐ Glass		1						☐ Yes	☐ No	HNO_3
Diss Hg	☐ Plastic	☑ Glass	1							☑ Yes	☐ No	HCl
Diss metal	☐ Plastic	☐ Glass		1						☐ Yes	☐ No	HNO_3

SCN No. ~~3SCN-06~~ SCN-3014-07 Consumables: ☐ Syringes / Filters ☐ Other

Field Dup. ~~3SCN-07~~

SURFACE WATER SAMPLING DATA

SAMPLE NO.: K19-SW17-07 Culvert Inlet

roject Name: K-19
Project No.: 1657709-5000
ocation: K-19 Truten Bc
Date: July 23/17 **Time:** 9 11:30
Weather: Running **Temperature:** 9°C
Completed By: AW/MZ
GPS Coordinates: UTM 10V 6399029 N 0503350 E
Reviewed By:

EQUIPMENT LIST

Multimeter Model: YSI Pro Plus 142962 ☐ Rental Equipment:
pH/Temp Meter Model:
Conductivity Meter Model: ☐ Field Bump
Dissolved Oxygen Meter Model: ☑ pH4 ☑ pH7
ORP (Redox) Meter Model: ☑ pH10
Organic Vapour Meter Model: ☑ 1413 us/cm
☐ D.O. Ampoule ☑ Field Calibration DK

STATION INFORMATION

Aquatic Environment: ☑ Fresh ☐ Marine ☐ Estuarine Photograph No.(s):
Co-Located Sample(s): Type (sediment): ID:

SURFACE WATER SAMPLING

Method of Sample Collection: ☐ Grab ☑ Pump ☐ Other:

Flow
Method: ☐ Flow Meter Model:
☐ Velocity Head Rod (ruler):
☐ Velocity m/s Water Depth cm

Time	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	TDS (g/L)	Redox (ORP)	Diss. O₂ [✓ (mg/L)] or (%)	Sal (ppt)	Remarks
11:35	8.7	6.24	407	00247	46.4	7.90	0.02	
11:45	8.7	6.31	38.8	00247	25.8	7.87	0.02	
11:55	8.7	6.34	~~283~~ 412	00247	21.1	7.30	0.02	

Comments: organic hue
Odour: ☐ Yes ☑ No If yes
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear | | | [✓ | |] | | [✓ |] | | | | | | | | | | | | | | | | | | | | | | Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
VOC / BTEX	☐ Plastic	☐ Glass	3							☐ Yes	☑ No	✓
Diss metal	☐ Plastic	☐ Glass		1						☑ Yes	☐ No	HNO3
Diss Hg	☐ Plastic	☐ Glass	1							☑ Yes	☐ No	HCl
Total metal	☐ Plastic	☐ Glass		1						☐ Yes	☑ No	HNO3
Total Hg	☐ Plastic	☐ Glass	1							☐ Yes	☑ No	HCl
LEM / HEPH	☐ Plastic	☐ Glass			2					☐ Yes	☑ No	✓
F2-F4	☐ Plastic	☐ Glass			2					☐ Yes	☑ No	No
Chloride				1								~
Glycol			3									

SCN No. 03844-01 Consumables: ☐ Syringes / [✓ Filters] Waterra ☐ Other
Field Dup.

SURFACE WATER SAMPLING DATA

SAMPLE NO.: K19-SW17-08
culvert outlet

Project Name: K-19
Location: K-19 Trutch BC
Weather: Raining **Temperature:**
GPS Coordinates: UTM 10V 6399125 N 0503307E
Project No.: 1657709-5000
Date: July 23/2017 **Time:** 12:30
Completed By: AW / MZ
Reviewed By:

EQUIPMENT LIST

Multimeter	Model: YSI Pro Plus 142962	☐	Rental Equipment:	
pH/Temp Meter	Model:			
Conductivity Meter	Model:	☐	Field Bump	
Dissolved Oxygen Meter	Model:		☐ pH4	☐ pH7
ORP (Redex) Meter	Model:		☐ pH10	
Organic Vapour Meter	Model:		☐ 1413 us/cm	
☐ D.O. Ampoule		☐	Field Calibration	

STATION INFORMATION

Aquatic Environment: ☑ Fresh ☐ Marine ☐ Estuarine Photograph No.(s):
Co-Located Sample(s): Type (sediment): ID:

SURFACE WATER SAMPLING

Method of Sample Collection: ☐ Grab ☑ Pump ☐ Other:

Flow

Method: ☐ Flow Meter Model:
☐ Velocity Head Rod (ruler):
☐ Velocity m/s Water Depth cm

Time	Temp. (°C)	pH (Units)	☐ Cond. ☐ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	TDS (g/L)	Redox (ORP)	Diss. O₂ [✓ (mg/L)] or (%)	Sal (ppt)	Remarks
	9.1	6.76	76.5	0.0500	45.6	10.31	0.04	
	9.1	6.81	75.6	0.0494	52.4	9.91	0.04	
	9.1	6.81	76.0	0.0494	43.3	9.83	0.04	

Comments:

Odour: ☐ Yes ☑ No If yes
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear | | | | | | | | | | | | | | | | | | | | | | | | | | [✓ |] | | | | Very Silty Turbidity increased due to heavy rain event.

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
VOC/BTEX	☐ Plastic	☐ Glass	3							☐ Yes	☑ No	✓
Dissolved Metal/Hg	☐ Plastic	☐ Glass	1	1						☑ Yes	☐ No	~~HCL~~/HNO3/HCl
Total Metal/Hg	☐ Plastic	☐ Glass	1	1						☐ Yes	☑ No	HNO3/HCl
PAH	☐ Plastic	☐ Glass			2					☐ Yes	☑ No	✓
F2-F4	☐ Plastic	☐ Glass			2					☐ Yes	☑ No	
Chloride	☐ Plastic	☐ Glass		1						☐ Yes	☑ No	
Glycol	☐ Plastic	☐ Glass	3							☐ Yes	☑ No	✓

SCN No. 03844-02 Consumables: ☐ Syringes / Filters ☐ Other
Field Dup.

SURFACE WATER SAMPLING DATA

SAMPLE NO.: K19-SW17-09
downstream from culvert

Project Name: K-19
Location: K-19 Truten Bc
Weather: rain
Temperature: 9°C
GPS Coordinates: UTM 10V 6399208 N 0503189 E
Project No.: 1657709-5000
Date: 23-JUL-17
Time: 1330
Completed By: AW / MZ
Reviewed By:

EQUIPMENT LIST

Multimeter	Model: YSI pro plus 142962	☐ Rental Equipment:	
pH/Temp Meter	Model: ↓		
Conductivity Meter	Model: ↓	☐ Field Bump	
Dissolved Oxygen Meter	Model: ↓	☑ pH4	☑ pH7
ORP (Redex) Meter	Model: ↓	☑ pH10	
Organic Vapour Meter	Model: ↓	☑ 1413 us/cm	
☐ D.O. Ampoule		☐ Field Calibration DK	

STATION INFORMATION

Aquatic Environment: ☑ Fresh ☐ Marine ☐ Estuarine Photograph No.(s):
Co-Located Sample(s): Type (sediment): ID:

SURFACE WATER SAMPLING

Method of Sample Collection: ☐ Grab ☐ Pump ☐ Other:

Flow

Method: ☐ Flow Meter Model:
☐ Velocity Head Rod (ruler):
☐ Velocity m/s Water Depth cm

Time	Temp. (°C)	pH (Units)	☐ Cond. ☑ Specific Cond. [✓ µS/cm] or mS/cm (circle one)	TDS (g/L)	Redox (ORP)	Diss. O₂ [✓ (mg/L)] or (%)	Sal (ppt)	Remarks
1320	9.2	7.37	124.3	0.0806	43.0	10.62	0.06	
1325	9.2	7.58	122.2	0.0793	33.9	10.94	0.06	
1330	9.2	7.60	122.1	0.0793	31.8	10.65	0.06	sampled

Comments:

Odour: ☐ Yes ☑ No If yes turbid with organic hue.
Sheen: ☐ Yes ☑ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like
Turbidity: Clear | | | | | | | | | | | | | | | | | | | | | [✓ |] | | | | | | | Very Silty

Analysis	Type		Container Size							Filtered		Preservatives
			40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L			
VPH/VOC/BTEX	☐ Plastic	☑ Glass	3							☐ Yes	☑ No	NaHSO4
D. Metals	☑ Plastic	☐ Glass		1						☑ Yes	☐ No	HNO3
D. Hg	☐ Plastic	☑ Glass	1							☑ Yes	☐ No	HCl
Tot. Metal	☑ Plastic	☐ Glass		1						☐ Yes	☑ No	HNO3
Tot. Hg	☐ Plastic	☑ Glass	1							☐ Yes	☑ No	HCl
PAH/LEPH/HEPH	☐ Plastic	☑ Glass			2					☐ Yes	☑ No	NaHSO4
F2-F4	☐ Plastic	☑ Glass			2					☐ Yes	☑ No	N/A
Cl	✓			1							✓	N/A

SCN No. 03844-03
Consumables: ☑ Syringes / [✓ Filters] waterra geofilter.
☐ Other
Field Dup.

SW BACKGROUND

SURFACE WATER SAMPLING DATA

SAMPLE NO.: K19-SW17-10

Project Name: K-19 | Project No.: 1657709-5000

Location: K-19 Truten BC | Date: July 29, 2017 | Time: 15:20

Weather: Overcast | Temperature: ~10-15 | Completed By: DK

GPS Coordinates: 10V 0503346 6398890 | Reviewed By:

EQUIPMENT LIST

Multimeter	Model: YSI ProPlus	☐	Rental Equipment:	
pH/Temp Meter	Model:			
Conductivity Meter	Model:	☐	Field Bump	
Dissolved Oxygen Meter	Model:		☐ pH4	☐ pH7
ORP (Redex) Meter	Model:		☐ pH10	
Organic Vapour Meter	Model:		☐ 1413 us/cm	
☐ D.O. Ampoule		☑	Field Calibration	DO, 7, 4, 10, 1413

STATION INFORMATION

Aquatic Environment: ☑ Fresh ☐ Marine ☐ Estuarine | Photograph No.(s):

Co-Located Sample(s): - | Type (sediment): - | ID:

SURFACE WATER SAMPLING

Method of Sample Collection: ☐ Grab ☒ Pump ☐ Other: geopump

Flow

Method: ☐ Flow Meter Model:

☐ Velocity Head Rod (ruler):

☐ Velocity standing m/s | Water Depth cm

Time	Temp. (°C)	pH (Units)	☐ Cond. ☐ Specific Cond. µS/cm or mS/cm (circle one)	TDS (g/L)	Redox (ORP)	Diss. O_2 (mg/L) or (%)	Sal (ppt)	Remarks
15:21	10.7	6.02	314	0.0201	55.2	4.17	0.01	standing, clear, NO, NS
15:31	10.7	5.89	321	0.0208	61.0	3.45	0.01	" " " "
15:41	10.6	5.86	32.7	0.0215	64.1	3.09	0.01	" " " "

Comments:

Odour: ☐ Yes ☒ No If yes

Sheen: ☐ Yes ☒ No If yes ☐ Hydrocarbon-like OR ☐ Metallic-like

Turbidity: Clear |X| Very Silty

Analysis	Type		Container Size 40 mL	120 mL	250 mL	500 mL	1 L	2 L	4 L	Filtered		Preservatives
BTEX/VPH/MOC/F1	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	sodium bisulfate
Glycols	☐ Plastic	☒ Glass	3							☐ Yes	☒ No	" "
L/M/PAH	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	" "
F2-F4	☐ Plastic	☒ Glass			2					☐ Yes	☒ No	none
D.metals/dHg	☒ Plastic	☐ Glass	1	1						☒ Yes	☐ No	HNO_3 / HCl
T.metals/tHg	☒ Plastic	☐ Glass	1	1						☐ Yes	☒ No	HNO_3 / HCl
chloride	☐ Plastic	☐ Glass	1	1						☐ Yes	☒ No	none

* 15 cont

SCN No. 03763-03 | Consumables: ☒ Syringes / Filters 1 | ☐ Other ~0.20m 1/4" ~0.10m silicon

Field Dup. -

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Golder Associates

APPENDIX G

Groundwater Elevations

Well ID	Date	Time	Depth to Water (m btoc)	Casing Elevation (m asl)	Calculated Groundwater Elevation (m asl)
K19a-09MW-01	12-Jul-17	12:02	6.2	854.876	848.676
K19a-09MW-02	12-Jul-17	11:45	4.62	855.105	850.485
K19a-09MW-03	12-Jul-17	12:47	4.41	857.149	852.739
K19a-09MW-04	12-Jul-17	12:51	3.76	857.62	853.86
K19a-09MW-05	12-Jul-17	10:53	3.195	858.05	854.855
K19a-09MW-06	12-Jul-17	11:15	4.07	857.642	853.572
K19a-09MW-07	12-Jul-17	14:30	3.54	861.701	858.161
K19a-09MW-08	12-Jul-17	14:45	2.71	862.297	859.587
K19a-09MW-09	12-Jul-17	16:37	4.49	861.665	857.175
K19a-09MW-10	12-Jul-17	15:10	2.67	863.612	860.942
K19a-09MW-11	12-Jul-17	15:16	DRY	862.837	-
K19b-09MW-02	16-Jul-17	8:55	3.877	862.526	858.649
K19b-09MW-03	16-Jul-17	9:00	4.598	863.627	859.029
K19b-09MW-04	17-Jul-17	8:44	3.283	861.797	858.514
K19b-09MW-05	17-Jul-17	9:05	2.422	859.732	857.31
K19b-09MW-06	16-Jul-17	8:48	3.456	858.63	855.174
K19b-09MW-07	13-Jul-17	13:26	6.534	856.195	849.661
K19a-10MW-02	12-Jul-17	12:30	5.91	855.597	849.687
K19a-10MW-03	12-Jul-17	12:08	6.149	854.207	848.058
K19a-10MW-04	12-Jul-17	11:28	4.97	855.325	850.355
K19a-10MW-05	12-Jul-17	11:36	3.202	857.87	854.668
K19a-10MW-07	12-Jul-17	10:44	3.542	857.968	854.426
K19a-10MW-09	12-Jul-17	10:46	3.54	857.761	854.221
K19a-10MW-10	12-Jul-17	13:45	5.07	858.867	853.797
K19a-10MW-19	12-Jul-17	15:15	5.45	863.451	858.001
K19a-10MW-20	12-Jul-17	15:02	5.97	863.572	857.602
K19a-10MW-21	12-Jul-17	15:25	5.381	862.142	856.761
K19a-10MW-22	12-Jul-17	15:05	5.579	862.4	856.821
K19a-10MW-24	12-Jul-17	14:53	4.173	862.757	858.584
K19a-10MW-25	12-Jul-17	14:20	3.22	858.827	855.607
K19a-10MW-26	12-Jul-17	14:06	2.323	858.203	855.88
K19a-10MW-27	12-Jul-17	14:15	5.55	858.795	853.245
K19a-10MW-28	12-Jul-17	13:50	5.10	859.277	854.177
K19a-10MW-29	12-Jul-17	13:45	3.884	858.969	855.085
K19b-10MW-12	17-Jul-17	8:55	4.012	863.924	859.912
K19b-10MW-13	17-Jul-17	8:51	4.202	863.332	859.13
K19b-10MW-14	16-Jul-17	9:05	4.226	863.219	858.993

Well ID	Date	Time	Depth to Water (m btoc)	Casing Elevation (m asl)	Calculated Groundwater Elevation (m asl)
K19b-10MW-15	13-Jul-17	13:48	7.245	856.792	849.547
K19b-10MW-16	13-Jul-17	13:43	7.405	856.612	849.207
K19b-10MW-18	13-Jul-17	13:13	5.611	855.136	849.525
K19-MW16-01D	12-Jul-17	13:20	6.07	855.386	849.316
K19-MW16-01S	12-Jul-17	13:24	5.812	855.436	849.624
K19-MW16-02	12-Jul-17	12:13	4.84	855.24	850.4
K19-MW16-03D	12-Jul-17	12:13	6.146	854.25	848.104
K19-MW16-03S	12-Jul-17	12:15	5.96	854.181	848.221
K19-MW16-04	12-Jul-17	13:35	3.11	858.492	855.382
K19-MW16-05	12-Jul-17	14:12	4.777	857.705	852.928
K19-MW16-06	12-Jul-17	14:00	5.475	858.845	853.37
K19-MW16-07D	12-Jul-17	16:00	3.06	868.041	864.981
K19-MW16-07S	12-Jul-17	16:02	3.194	868.115	864.921
K19-MW16-08	12-Jul-17	15:09	5.849	862.627	856.778
K19-MW16-09	12-Jul-17	15:30	5.15	863.223	858.073
K19-MW16-10S	12-Jul-17	-	3.46	850.493	847.033
K19-MW16-11	13-Jul-17	13:31	6.684	856.265	849.581
K19-MW16-13	12-Jul-17	13:10	3.605	856.526	852.921
K19-MW16-14	12-Jul-17	12:20	6.64	854.753	848.113
K19-MW16-15	12-Jul-17	15:45	5.12	862.999	857.879
K19-MW17-01D	12-Jul-17	13:15	7.00	855.337	848.337
K19-MW17-01S	12-Jul-17	13:16	4.786	855.348	850.562
K19-MW17-02	12-Jul-17	13:34	5.926	855.404	849.478
K19-MW17-04	12-Jul-17	16:12	4.316	865.364	861.048
K19-MW17-05	12-Jul-17	14:50	3.87	861.856	857.986
K19-MW17-06	12-Jul-17	14:38	8.27	861.532	853.262
K19-MW17-07	12-Jul-17	15:47	5.59	862.582	856.992
K19-MW17-10	12-Jul-17	14:42	5.779	861.526	855.747
K19-MW17-11	12-Jul-17	16:27	3.141	863.413	860.272
K19-MW17-12	12-Jul-17	16:22	DRY	866.01	-
K19-MW17-13	12-Jul-17	15:25	5.61	864.151	858.541
K19-MW17-17	26-Jul-17	10:40	4.689	860.706	856.017
K19-MW17-18	26-Jul-17	12:10	4.095	862.916	858.821
K19-MW17-19	25-Jul-17	13:01	3.160	857.799	854.639
K19-MW17-20	25-Jul-17	16:10	2.012	862.891	860.879
K19-MW17-21	25-Jul-17	14:30	3.517	864.431	860.914
K19-MW17-22	27-Jul-17	13:00	3.366	864.955	861.589

Well ID	Date	Time	Depth to Water (m btoc)	Casing Elevation (m asl)	Calculated Groundwater Elevation (m asl)
K19-MW17-23	27-Jul-17	9:50	7.760	864.954	857.194
K19-MW17-24	26-Jul-17	13:45	2.330	862.519	860.189
K19-MW17-25	26-Jul-17	14:58	3.944	856.308	852.364
K19-MW17-26	30-Jul-17	9:00	5.778	862.828	857.05
K19-MW17-27	27-Jul-17	11:05	3.654	860.027	856.373
K19-MW17-28	27-Jul-17	14:45	4.941	854.874	849.933
K19-MW17-29D	28-Jul-17	16:20	4.800	854.04	849.24
K19-MW17-29S	28-Jul-17	10:05	3.657	854.09	850.433
K19-MW17-30	28-Jul-17	9:40	4.878	862.505	857.627
K19-MW17-31	29-Jul-17	9:20	2.398	862.58	860.182
K19-MW17-32	27-Jul-17	16:06	2.382	858.17	855.788
K19-MW17-33	28-Jul-17	13:53	4.269	852.742	848.473
K19-MW17-34	28-Jul-17	14:57	3.899	856.073	852.174
K19-MW17-35D	29-Jul-17	11:35	3.750	854.465	850.715
K19-MW17-35S	29-Jul-17	9:20	3.557	854.446	850.889

Notes:

m btoc = metres below top of casing

m asl = metres above sea level

APPENDIX H

Results of Single-well Response Tests

SINGLE WELL RESPONSE TEST DATA SHEET

☑ Rising Head ☐ Falling Head

Well No.: K19-MW17-28

Well No.: K19-MW17-28 **Project No.:** 1657709-5000

Location: K-19 Truth BC **Date:** 30-July-17 **Time:** 1050

Approximate Elevation: 861 m. asl. **Completed by:** MZ

Weather: Clear **Temperature:** 20°C **Reviewed by:**

MONITORING WELL INFORMATION

Depth to Water Below Top of Pipe: 5.112 metres

Depth to Bottom of Well Below Top of Pipe: 8.36 metres

Distance from Top of Pipe to Ground Surface: approx 0.72 metres

Screened Unit: _____ (e.g., sand, silt, clay)

Pipe Diameter: 0.051 metres (1 inch = 0.025 metres)

Borehole Diameter: 0.152 metres

Screen Length: 1.5 metres (1 inch = 0.025 metres)

Static Water Relative to Top of Screen: ☑ Above ☐ Below

EQUIPMENT LIST

☐ **Slug**

Mass (if known): _____ kilograms

Length: _____ metres

Diameter: _____ metres

Expected Change in Water Column Height (added/displaced)

$\frac{dia_{slug^2}}{dia_{mw^2}} \times h\ slug$: _____

☑ **Bailer**

Water Column Height: _____ metres

Inside Diameter: _____ metres

and/or Volume of Water Removed: 1.0 litres

Expected Change in Water Column Height (displaced)

$\frac{dia_{bailer^2}}{dia_{mw^2}} \times h\ water\ in\ bailer$: 0.49 m

Pressure Transducer Serial No.: 002102 213627

Sampling Interval: sched.: 1s for 5 min; 10s for 30 min; 1 min for 5 hours ☐ Seconds or ☐ Minutes

SINGLE WELL RESPONSE TEST

Target Depth for Bottom of Slug: 6.4 m below top of pipe

Target Depth for Transducer 7.6 m below top of pipe

Static Water Level: 5.112 m btc Time: 10 56

Calculated 95% recovery = static water level +/- 0.95 x expected change in water column height: 5.09 m btc

Water Level After Any Tubing Removed: — Time: —

Water Level After Transducer & Bailer Added: 5.062 m btc Time: 11:34

SLUG/BAILER ADDED/REMOVED (Start of Time): _____ Time: 11:35

Water Level Before Transducer Removed: 5.094 Time: 13:25.

Finish Time: 13.26.

Time	Elapsed Time	Water Depth (m to top)
11:36	1m	5.498
11:38	3m	5.438
[illegible]	[illegible]	
13 25.	1hr 50m	5.094

Time (continued)	Elapsed Time (continued)	Water Depth (m to top) (continued)

Notes: SINGLE TEST; NO ADDITIONAL REPETITIONS.

SINGLE WELL RESPONSE TEST DATA SHEET

☑ Rising Head ☐ Falling Head Well No.: K19-MW17-29D

Well No.: K19-MW17-29D **Project No.:** 1657709-5000

Location: K-19 Truth Bc **Date:** 29-JUL-17 **Time:** 1120

Approximate Elevation: 862m **Completed by:** MZ

Weather: overcast **Temperature:** 21°C **Reviewed by:**

MONITORING WELL INFORMATION

Depth to Water Below Top of Pipe: 4.936 metres

Depth to Bottom of Well Below Top of Pipe: 9.04 metres

Distance from Top of Pipe to Ground Surface: approx. -0.34 metres

Screened Unit: WEATHERED SILTSTONE (e.g., sand, silt, clay)

Pipe Diameter: 0.051 metres (1 inch = 0.025 metres)

Borehole Diameter: 0.152 metres

Screen Length: 1.5 metres (1 inch = 0.025 metres)

Static Water Relative to Top of Screen: ☑ Above ☐ Below

EQUIPMENT LIST

→ (W2)

☐ **Slug**

Mass (if known): _____ kilograms

Length: _____ metres

Diameter: _____ metres

Expected Change in Water Column Height (added/displaced)

$\frac{dia_{slug^2}}{dia_{mw^2}} \times h\ slug$: _____

☑ **Bailer**

Water Column Height: _____ metres

Inside Diameter: _____ metres

and/or Volume of Water Removed: 1.0 litres

Expected Change in Water Column Height (displaced)

$\frac{dia_{bailer^2}}{dia_{mw^2}} \times h\ water\ in\ bailer$: 0.49 m

Pressure Transducer Serial No.: 00210 21362

Sampling Interval: Sched.: 1s for 5 min; 10s for 30 min; 1 min for 5 hrs. ☐ Seconds or ☐ Minutes

SINGLE WELL RESPONSE TEST

Target Depth for Bottom of Slug: 6.3 m below top of pipe

Target Depth for Transducer 7.5 m below top of pipe

Static Water Level: 4.902 Time: 11:32

Calculated 95% recovery = static water level +/- 0.95 x expected change in water column height: 4.902 m btc

Water Level After Any Tubing Removed: — Time: —

Water Level After Transducer Added: 4.877 m btc Time: 12:05

SLUG/BAILER ADDED/REMOVED (Start of Time): Time: 12:06

Water Level Before Transducer Removed: 4.889 m btc Time: 13:07

Finish Time: 13:08

Time	Elapsed Time	Water Depth (m to top)
12:08	2m	5.294
12:10	4m	5.207
12:12	6m	5.151
12:18	12m	5.049
12:35	29m	4.915
12:58	52m	4.893
13:07	1hr 1m	4.889

Time (continued)	Elapsed Time (continued)	Water Depth (m to top) (continued)

Notes: TEST #1

transducer data from 29S available

no effect noted from adjacent well

SINGLE WELL RESPONSE TEST DATA SHEET

☑ Rising Head ☐ Falling Head Well No.: K19-MW 17-29D

Well No.: K19-MW17-29D **Project No.:** 1657709-5000
Location: K-19 Truth Bc **Date:** 29-JUL-17 **Time:** 13:10
Approximate Elevation: 862 m **Completed by:** MZ
Weather: overcast **Temperature:** 21°C **Reviewed by:**

MONITORING WELL INFORMATION

Depth to Water Below Top of Pipe: 4.890 metres
Depth to Bottom of Well Below Top of Pipe: 9.04 metres
Distance from Top of Pipe to Ground Surface: approx -0.34 metres
Screened Unit: WEATHERED SILTSTONE (e.g., sand, silt, clay)
Pipe Diameter: 0.051 metres (1 inch = 0.025 metres)
Borehole Diameter: 0.152 metres
Screen Length: 1.5 metres (1 inch = 0.025 metres)
Static Water Relative to Top of Screen: ☑ Above ☐ Below

EQUIPMENT LIST → (W2)

☐ **Slug**
Mass (if known): _____ kilograms
Length: _____ metres
Diameter: _____ metres
Expected Change in Water Column Height (added/displaced)
$\frac{dia_{slug^2}}{dia_{mw^2}} \times h\ slug$: _____

☑ **Bailer**
Water Column Height: _____ metres
Inside Diameter: _____ metres
and/or Volume of Water Removed: 1.0 litres
Expected Change in Water Column Height (displaced)
$\frac{dia_{bailer^2}}{dia_{mw^2}} \times h\ water\ in\ bailer$: 0.49 m

Pressure Transducer Serial No.: 00210 213662
Sampling Interval: sched.; 1s for 5 min; 10s for 30 min; 1 min for 5 hours ☐ Seconds or ☐ Minutes

SINGLE WELL RESPONSE TEST

Target Depth for Bottom of Slug: 6.3 m below top of pipe
Target Depth for Transducer 7.5 m below top of pipe
Static Water Level: 4.890 m btc Time: 1311
Calculated 95% recovery = static water level +/- 0.95 x expected change in water column height: 4.908 m btc
Water Level After Any Tubing Removed: — Time: —
Water Level After Transducer & Bailer Added: 4.883 m btc Time: 1337
SLUG/BAILER ADDED/REMOVED (Start of Time): Time: 1339
Water Level Before Transducer Removed: 4.891 m btc Time: 1510
Finish Time: _____

Time	Elapsed Time	Water Depth (m to top)
1341	2m	
1343	4m	
1345	6m	
1510	1hr 31m	

Time (continued)	Elapsed Time (continued)	Water Depth (m to top) (continued)

Notes: TEST #2
transducer data from 295 available)
but no effect noted from adjacent well

295 transducer removal
15:33; DTW @ btc = 4.481 m

Golder Associates

(TEST #1)

SINGLE WELL RESPONSE TEST DATA SHEET

☑ Rising Head ☐ Falling Head

Well No.: K19-MW17-32

Well No.: K19-MW17-32 **Project No.:** 1657709-5000

Location: K-19 Truth BC **Date:** 28-JUL-17 **Time:** 14:10

Approximate Elevation: 861 m asl **Completed by:** MZ

Weather: partly cloudy **Temperature:** 22°C **Reviewed by:**

MONITORING WELL INFORMATION

Depth to Water Below Top of Pipe:	____ metres	Pipe Diameter:	0.051 metres (1 inch = 0.025 metres)
Depth to Bottom of Well Below Top of Pipe:	5.84 metres	Borehole Diameter:	0.152 metres
Distance from Top of Pipe to Ground Surface:	0.82 metres	Screen Length:	1.5 metres (1 inch = 0.025 metres)
Screened Unit: WEATHERED SILTSTONE (e.g., sand, silt, clay)		Static Water Relative to Top of Screen:	☑ Above ☐ Below

EQUIPMENT LIST

☐ **Slug**

Mass (if known): ____ kilograms

Length: ____ metres

Diameter: ____ metres

Expected Change in Water Column Height (added/displaced)

$\frac{dia_{slug^2}}{dia_{mw^2}} \times h\ slug$: ____

☑ **Bailer**

Water Column Height: ____ metres

Inside Diameter: ____ metres

and/or Volume of Water Removed: 1.0 litres

Expected Change in Water Column Height (displaced)

$\frac{dia_{bailer^2}}{dia_{mw^2}} \times h\ water\ in\ bailer$: 0.49 m

Pressure Transducer Serial No.: 00210 21362

Sampling Interval: sched. 1s for 5min; 10s for 30 min; 1 min for 5 hr ☐ Seconds or ☐ Minutes

SINGLE WELL RESPONSE TEST

Target Depth for Bottom of Slug: 3.6 m below top of pipe

Target Depth for Transducer: 5.1 m below top of pipe

Static Water Level: 2.435 m btc Time: 1436

Calculated 95% recovery = static water level +/- 0.95 x expected change in water column height: 2.41 m

Water Level After Any Tubing Removed: — Time: —

Water Level After Transducer Added: 2.375 m btc Time: 1507

SLUG/BAILER ADDED/REMOVED (Start of Time): & Bailer Time: 1509

Water Level Before Transducer Removed: 2.398 m btc Time: 1715

Finish Time: ____

Time	Elapsed Time	Water Depth (m to top)
1511	2 min	2.784
1515	6 min	2.647
1523	14 min	2.543
1539	30 min	2.452
1711	2 hr 2 min	2.401

Time (continued)	Elapsed Time (continued)	Water Depth (m to top) (continued)

Notes: TEST #1

(TEST #2)

SINGLE WELL RESPONSE TEST DATA SHEET

☑ Rising Head ☐ Falling Head

Well No.: K19-MW-17-32

Well No.: K19-MW17-32 **Project No.:** 1657709-5000

Location: K-19 Truten BC **Date:** 28-JUL-17 **Time:** 17:20

Approximate Elevation: 861 m asl **Completed by:** MZ

Weather: partly cloudy **Temperature:** 22°C **Reviewed by:**

MONITORING WELL INFORMATION

Depth to Water Below Top of Pipe:	metres	Pipe Diameter:	0.051 metres (1 inch = 0.025 metres)
Depth to Bottom of Well Below Top of Pipe:	5.84 metres	Borehole Diameter:	0.152 metres
Distance from Top of Pipe to Ground Surface:	0.82 metres	Screen Length:	1.5 metres (1 inch = 0.025 metres)
Screened Unit: MOD. WEATHERED SILTSTONE (e.g., sand, silt, clay)		Static Water Relative to Top of Screen:	☑ Above ☐ Below

EQUIPMENT LIST

☐ **Slug**

Mass (if known): _____ kilograms

Length: _____ metres

Diameter: _____ metres

Expected Change in Water Column Height (added/displaced)

$\frac{dia_{slug^2}}{dia_{mw^2}} \times h\ slug$: _____

☑ **Bailer**

Water Column Height: _____ metres

Inside Diameter: _____ metres

and/or Volume of Water Removed: 1.0 litres

Expected Change in Water Column Height (displaced)

$\frac{dia_{bailer^2}}{dia_{mw^2}} \times h\ water\ in\ bailer$: 0.49 m

Pressure Transducer Serial No.: 00210 21362

Sampling Interval: sched.: 1s for 5 min; 10 s for 30 min; 1 min for 5 hr. ☐ Seconds or ☐ Minutes

SINGLE WELL RESPONSE TEST

Target Depth for Bottom of Slug: 3.6 m below top of pipe

Target Depth for Transducer 5.1 m below top of pipe

Static Water Level: 2.398 m btc Time: 17:20

Calculated 95% recovery = static water level +/- 0.95 x expected change in water column height: 2.41 m btc

Water Level After Any Tubing Removed: — Time: —

Water Level After Transducer Added: 2.374 m btc Time: 17:33

SLUG/BAILER ADDED/REMOVED (Start of Time): ~~Slug~~ Bailer Time: 17:35

Water Level Before Transducer Removed: *2.417 m btc Time: 08:49 (29-JUL)

Finish Time: logger stopped 23:10 28-JUL

Time	Elapsed Time	Water Depth (m to top)
17:36	1 min	2.826
17:38	3 min	2.756
17:40	5 min	2.704
29-JUL 08:49	15 hr 14 min	2.417 *

Time (continued)	Elapsed Time (continued)	Water Depth (m to top) (continued)

Notes: TEST #2

* → transducer live reading 3.3110 m (taken since logging schedule expired prior to removal)

SINGLE WELL RESPONSE TEST DATA SHEET

☑ Rising Head ☐ Falling Head

Well No.: K19-MW17-35D

Well No.: K19-MW17-35D | Project No.: 1657709-5000
Location: K-19 Truten BC | Date: 30-JUL-17 | Time: 08 50
Approximate Elevation: 861 m asl | Completed by: MZ
Weather: clear | Temperature: 13°C | Reviewed by:

MONITORING WELL INFORMATION

Depth to Water Below Top of Pipe: 3.837 metres
Depth to Bottom of Well Below Top of Pipe: 7.60 metres
Distance from Top of Pipe to Ground Surface: approx −0.22 metres
Screened Unit: WEATHERED SILTSTONE (e.g., sand, silt, clay)
Pipe Diameter: 0.051 metres (1 inch = 0.025 metres)
Borehole Diameter: 0.152 metres
Screen Length: 1.5 metres (1 inch = 0.025 metres)
Static Water Relative to Top of Screen: ☑ Above ☐ Below

EQUIPMENT LIST

☐ Slug
Mass (if known): _____ kilograms
Length: _____ metres
Diameter: _____ metres
Expected Change in Water Column Height (added/displaced)
$\frac{dia_{slug^2}}{dia_{mw^2}} \times h\ slug$: _____

☑ Bailer
Water Column Height: _____ metres
Inside Diameter: _____ metres
and/or Volume of Water Removed: 1.0 litres
Expected Change in Water Column Height (displaced)
$\frac{dia_{bailer^2}}{dia_{mw^2}} \times h\ water\ in\ bailer$: 0.49 m

Pressure Transducer Serial No.: 00210 21362
Sampling Interval: sched.: 0.5 s for 2 min; 1 s for 30 min.; 1 min for 2 hours ☐ Seconds or ☐ Minutes

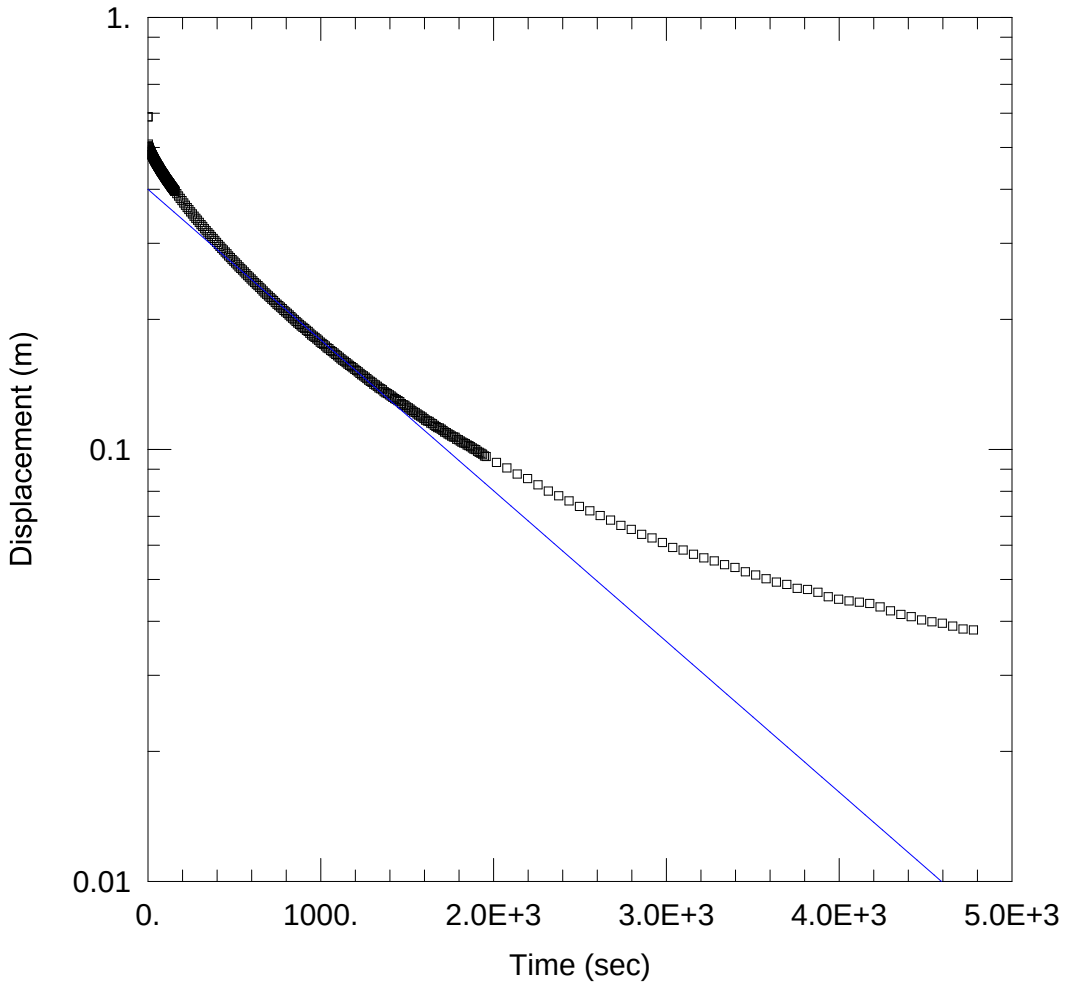
SINGLE WELL RESPONSE TEST

Target Depth for Bottom of Slug: 5.2 m below top of pipe
Target Depth for Transducer: 6.4 m below top of pipe
Static Water Level: 3.837 m btc Time: 09:01
Calculated 95% recovery = static water level +/- 0.95 x expected change in water column height: 3.86 m btc
Water Level After Any Tubing Removed: — Time: —
Water Level After Transducer Added: (T1) 3.835 m btc (*new static) Time: 09 29 / 09 49 / 10 09
→ (T2) 3.839 (T3) 3.843
SLUG/BAILER ADDED/REMOVED (Start of Time): Test #1 / #2 / #3 Time: 09 31 / 09 51 / 10 11
Water Level Before Transducer Removed: Following (T3) 3.852 m btc Time: 10 22
Finish Time: 10 23

	Time	Elapsed Time	Water Depth (m to top)
(T1)	09 33	2 m	3.860
(T1)	09 42	11 m	3.846
(T2)	09 53	2 m	3.863
(T2)	10 02	11 m	3.848
(T3)	10 13	2 m	3.868
(T3)	10 22	11 m	3.852

Time (continued)	Elapsed Time (continued)	Water Depth (m to top) (continued)

Notes: TESTS #1, #2, and #3 included on this sheet.



K19-MW17-28 SLUG TEST

Data Set: \...\MW17-28_Test1.aqt
Date: 10/12/17 Time: 11:16:23

PROJECT INFORMATION

Company: Golder Associates Ltd.
Client: PWGSC
Project: 1657709
Location: Trutch, BC
Test Well: K19-MW17-06
Test Date: 7-Feb-2017

AQUIFER DATA

Saturated Thickness: 1.5 m Anisotropy Ratio (Kz/Kr): 1.

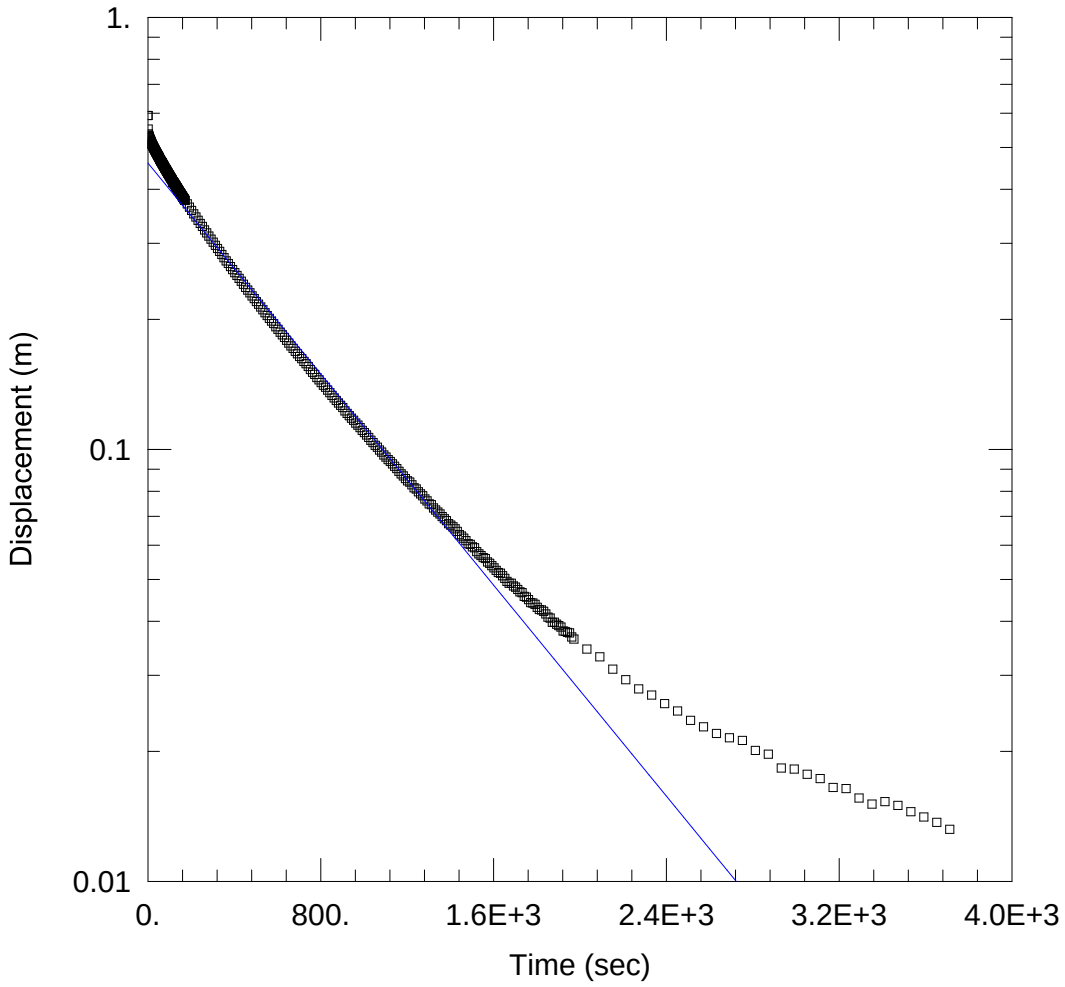
WELL DATA (K19-MW17-28)

Initial Displacement: 0.589 m
Total Well Penetration Depth: 1.5 m
Casing Radius: 0.026 m
Static Water Column Height: 3.3 m
Screen Length: 1.5 m
Well Radius: 0.076 m

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 4.0E-7 m/sec y0 = 0.4 m



K19-MW17-29D SLUG TEST

Data Set: \...\MW17-29D_Test1.aqt
Date: 10/12/17 Time: 11:36:33

PROJECT INFORMATION

Company: Golder Associates Ltd.
Client: PWGSC
Project: 1657709
Location: Trutch, BC
Test Well: K19-MW17-06
Test Date: 7-Feb-2017

AQUIFER DATA

Saturated Thickness: 1.5 m Anisotropy Ratio (Kz/Kr): 1.

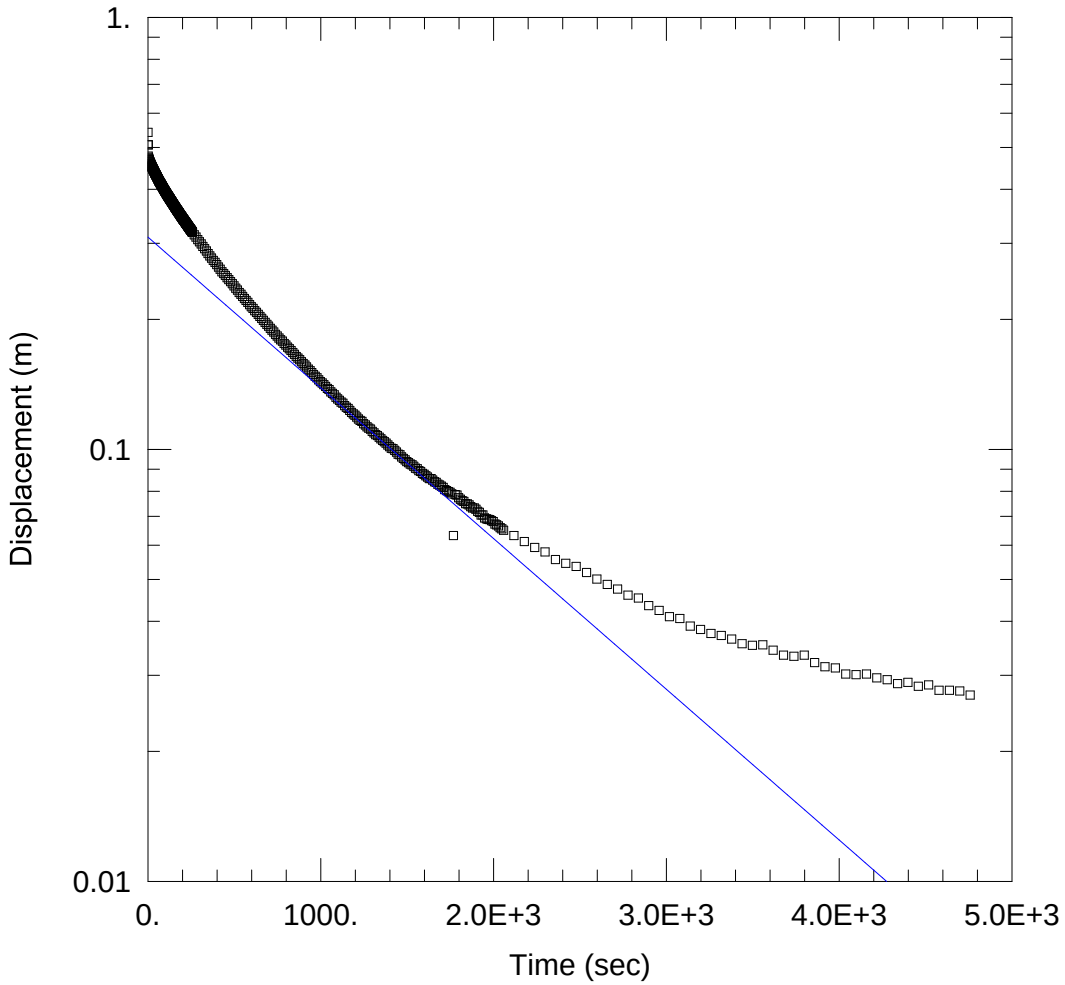
WELL DATA (K19-MW17-29D)

Initial Displacement: 0.593 m
Total Well Penetration Depth: 1.5 m
Casing Radius: 0.026 m
Static Water Column Height: 4.16 m
Screen Length: 1.5 m
Well Radius: 0.076 m

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 7.0E-7 m/sec
y0 = 0.46 m



K19-MW17-32 SLUG TEST

Data Set: \...\MW17-32_Test2.aqt
Date: 10/12/17 Time: 11:41:35

PROJECT INFORMATION

Company: Golder Associates Ltd.
Client: PWGSC
Project: 1657709
Location: Trutch, BC
Test Well: K19-MW17-06
Test Date: 7-Feb-2017

AQUIFER DATA

Saturated Thickness: 1.5 m Anisotropy Ratio (Kz/Kr): 1.

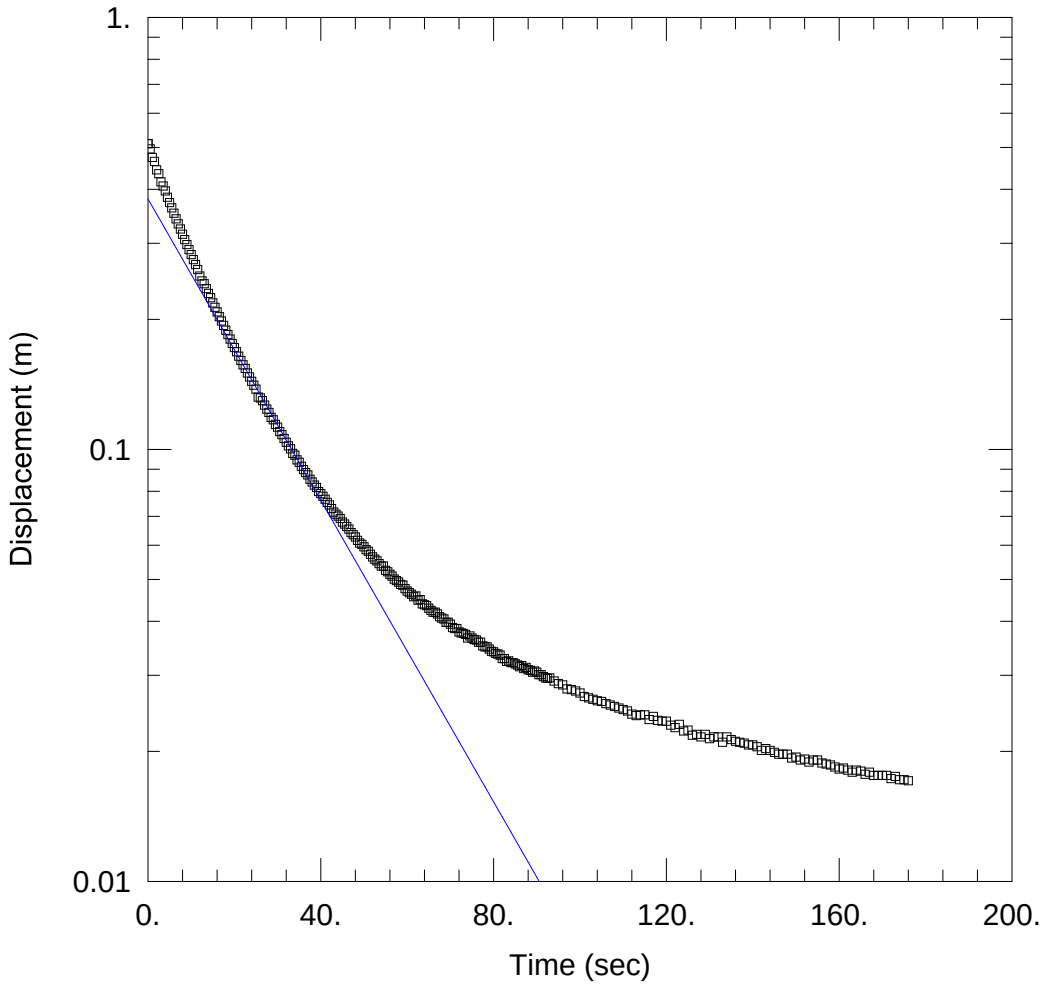
WELL DATA (K19-MW17-32)

Initial Displacement: 0.542 m
Total Well Penetration Depth: 1.5 m
Casing Radius: 0.026 m
Static Water Column Height: 3.41 m
Screen Length: 1.5 m
Well Radius: 0.076 m

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 4.0E-7 m/sec
y0 = 0.31 m



K19-MW17-35D SLUG TEST

Data Set: \...\MW17-35D_Test1.aqt
Date: 10/12/17 Time: 11:29:57

PROJECT INFORMATION

Company: Golder Associates Ltd.
Client: PWGSC
Project: 1657709
Location: Trutch, BC
Test Well: K19-MW17-06
Test Date: 7-Feb-2017

AQUIFER DATA

Saturated Thickness: 1.5 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (K19-MW17-35D)

Initial Displacement: 0.51 m
Total Well Penetration Depth: 1.5 m
Casing Radius: 0.026 m
Static Water Column Height: 3.77 m
Screen Length: 1.5 m
Well Radius: 0.076 m

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 2.0E-5 m/sec y0 = 0.38 m

APPENDIX I

Laboratory Certificates of Analysis and Chains of Custody

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
219-800 BURRARD ST
VANCOUVER, BC V6Z 0B9
604-671-1831

ATTENTION TO: Erin O'Brien

PROJECT: 1657709 5000

AGAT WORK ORDER: 17N238668

SOIL ANALYSIS REVIEWED BY: Jennifer Liu, Analyst, Qualified Person

TRACE ORGANICS REVIEWED BY: Andrew Garrard, B.Sc., General Manager

WATER ANALYSIS REVIEWED BY: Andrew Garrard, B.Sc., General Manager

DATE REPORTED: Aug 24, 2017

PAGES (INCLUDING COVER): 71

VERSION*: 4

Should you require any information regarding this analysis please contact your client services representative at (778) 452-4000

*NOTES

VERSION 4: Sample receipt temperature 3°C.

Version 4 issued on September 22, 2017 to report additional SWEP metals analysis as requested by Erin O'Brien of Golder. Version 4 is an amendment to all previous versions.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

(SWEP) Metals

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: 03796-01 SAMPLE TYPE: Soil DATE SAMPLED: 2017-07-14 8565765	03796-12 Soil 2017-07-14 8565806	03820-01 Soil 2017-07-14 8565807
Arsenic - Leachate (SWEP)	mg/L	2.5	0.5	<0.5	<0.5	<0.5
Barium - Leachate (SWEP)	mg/L	100	0.5	<0.5	<0.5	<0.5
Boron - Leachate (SWEP)	mg/L	500	0.5	<0.5	<0.5	<0.5
Cadmium - Leachate (SWEP)	mg/L	0.5	0.5	<0.5	<0.5	<0.5
Chromium - Leachate (SWEP)	mg/L	5	0.5	<0.5	<0.5	<0.5
Copper - Leachate (SWEP)	mg/L	100	0.5	<0.5	<0.5	<0.5
Lead - Leachate (SWEP)	mg/L	5	0.5	<0.5	<0.5	<0.5
Mercury - Leachate (SWEP)	mg/L	0.1	0.1	<0.1	<0.1	<0.1
Selenium - Leachate (SWEP)	mg/L	1	0.5	<0.5	<0.5	<0.5
Silver - Leachate (SWEP)	mg/L	5	0.5	<0.5	<0.5	<0.5
Uranium - Leachate (SWEP)	mg/L	10	0.5	<0.5	<0.5	<0.5
Zinc - Leachate (SWEP)	mg/L	500	0.5	<0.5	<0.5	<0.5

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to NORTHERN ROCKIES
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8565765-8565807 Analysis based on 'as received'.

Certified By:

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Soil Analysis - (SWEP), NO2,NO3, Cyanide,Flouride

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03796-03
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2017-07-14
Parameter	**Unit**	**G / S**	**RDL**	**8565771**
Fluoride - Leachate (SWEP)	mg/L	150	0.5	<0.5
Nitrate - Leachate (SWEP)	mg/L	1000	0.5	<0.5
Nitrite - Leachate (SWEP)	mg/L	1000	0.5	<0.5
Cyanide - Leachate (SWEP)	mg/L	20	0.002	<0.002

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to NORTHERN ROCKIES
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8565771 Analysis based on 'as received'.
Analysis performed at AGAT Calgary.

Certified By:

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Metals in Soil

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03796-06	03796-07	03796-11	03820-03	03820-08	03821-01	03821-05	03821-10
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-14	2017-07-14	2017-07-14	2017-07-14	2017-07-14	2017-07-15	2017-07-15	2017-07-15
Parameter	Unit	G / S	RDL	8565794	8565799	8565805	8565809	8565814	8565819	8565823	8565828
Aluminum	µg/g		10	26700	29300	15200	11100	17100	13400	15100	16900
Antimony	µg/g		0.1	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.5
Arsenic	µg/g		0.1	11.0	11.1	9.2	10.4	10.4	8.2	9.0	11.7
Barium	µg/g		0.5	689	811	316	402	291	257	267	393
Beryllium	µg/g		0.1	1.5	1.8	0.8	0.7	1.0	0.6	0.7	0.9
Bismuth	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	µg/g		0.01	1.06	1.45	0.16	0.09	0.17	0.12	0.12	0.18
Calcium	µg/g		10	8040	8010	2130	1100	1800	1400	2760	2410
Chromium	µg/g		1	35	39	23	18	27	20	22	25
Cobalt	µg/g		0.1	8.5	8.9	7.8	6.5	10.4	6.2	9.4	9.9
Copper	µg/g		0.2	29.1	32.8	23.4	24.5	27.6	16.3	22.1	30.4
Iron	µg/g		10	32000	33300	24200	22700	27400	21500	25900	28800
Lead	µg/g		0.1	18.4	19.4	12.9	13.0	14.1	13.1	13.3	15.4
Lithium	µg/g		0.5	27.6	33.0	16.4	11.4	18.0	12.1	13.8	18.8
Magnesium	µg/g		10	3750	3670	3300	2230	3690	2890	3090	3970
Manganese	µg/g		1	223	204	180	116	298	178	263	230
Mercury	µg/g		0.01	0.06	0.07	0.05	0.02	0.06	0.02	0.05	0.06
Molybdenum	µg/g		0.2	1.8	1.8	1.5	1.1	1.6	1.4	1.6	2.0
Nickel	µg/g		0.5	47.9	58.1	23.7	18.2	29.7	16.0	20.6	28.7
Phosphorus	µg/g		5	1520	1710	567	546	498	540	498	559
Potassium	µg/g		5	2870	2860	2290	2140	2110	2050	2230	2580
Selenium	µg/g		0.1	1.5	1.8	0.9	0.7	1.2	0.4	0.8	1.0
Silver	µg/g		0.5	0.6	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sodium	µg/g		5	469	510	140	309	395	100	92	118
Strontium	µg/g		1	51	54	34	37	35	25	27	42
Thallium	µg/g		0.1	0.4	0.4	0.2	0.2	0.3	0.2	0.2	0.2
Tin	µg/g		0.2	0.8	0.9	0.6	0.5	0.6	0.5	0.6	0.7
Titanium	µg/g		1	122	90	130	158	123	173	147	127
Uranium	µg/g		0.2	3.9	4.9	1.2	1.6	1.4	1.0	1.1	1.3
Vanadium	µg/g		1	75	83	43	32	52	44	43	46

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AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Metals in Soil

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03796-06	03796-07	03796-11	03820-03	03820-08	03821-01	03821-05	03821-10
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-14	2017-07-14	2017-07-14	2017-07-14	2017-07-14	2017-07-15	2017-07-15	2017-07-15
Parameter	Unit	G / S	RDL	8565794	8565799	8565805	8565809	8565814	8565819	8565823	8565828
Zinc	µg/g		1	107	117	90	77	100	63	79	115
Zirconium	µg/g		0.1	1.3	1.3	3.9	2.0	3.5	0.5	2.3	3.6
pH 1:2	pH units		0.05	6.23	6.14	4.80	5.46	5.43	5.12	6.04	5.19

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DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03822-02	03822-07	03822-12	03776-01	03776-02	03776-03	03776-04	03776-05
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-15	2017-07-16	2017-07-16	2017-07-16	2017-07-16	2017-07-16	2017-07-16	2017-07-16
Parameter	Unit	G / S	RDL	8565832	8565838	8565900	8565902	8565909	8565911	8565912	8565913
Aluminum	µg/g		10	18000	16800	16700	13500	7980	9340	5900	7660
Antimony	µg/g		0.1	0.4	0.3	0.5	0.4	1.2	0.5	0.3	0.4
Arsenic	µg/g		0.1	9.4	9.5	10.8	9.8	12.4	8.2	6.5	7.8
Barium	µg/g		0.5	360	395	367	379	589	326	338	239
Beryllium	µg/g		0.1	0.9	0.9	0.9	0.8	0.6	0.6	0.5	0.5
Bismuth	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	µg/g		0.01	0.13	0.13	0.17	0.36	1.12	0.51	0.48	0.44
Calcium	µg/g		10	1340	1530	2210	5110	15200	9300	18000	10400
Chromium	µg/g		1	25	24	26	22	19	20	13	15
Cobalt	µg/g		0.1	9.5	9.1	11.9	11.4	9.2	6.6	6.3	6.7
Copper	µg/g		0.2	26.6	28.6	29.4	20.1	26.9	15.4	13.2	14.5
Iron	µg/g		10	26900	27900	29400	23600	41000	22600	29700	25400
Lead	µg/g		0.1	13.6	15.2	15.8	17.4	74.0	29.6	8.5	8.5
Lithium	µg/g		0.5	22.7	17.5	18.6	16.7	9.7	10.6	8.1	9.1
Magnesium	µg/g		10	3570	3430	3830	3250	3420	3680	6380	4870
Manganese	µg/g		1	185	165	271	283	340	238	289	245
Mercury	µg/g		0.01	0.04	0.06	0.06	0.04	0.04	0.04	0.03	0.04
Molybdenum	µg/g		0.2	1.4	1.4	1.8	1.9	2.8	2.1	1.5	1.4
Nickel	µg/g		0.5	25.1	25.4	28.0	23.3	34.1	21.3	21.8	21.1
Phosphorus	µg/g		5	423	449	619	675	1400	1110	1120	1110
Potassium	µg/g		5	2490	2110	2580	1750	1310	1270	1180	1380
Selenium	µg/g		0.1	0.9	0.6	0.9	1.3	0.8	0.9	0.5	0.3
Silver	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sodium	µg/g		5	138	183	99	36	22	<5	17	15
Strontium	µg/g		1	41	36	38	35	56	33	42	29
Thallium	µg/g		0.1	0.2	0.2	0.3	0.2	0.1	0.2	0.1	0.1
Tin	µg/g		0.2	0.6	0.7	0.7	0.6	0.7	0.6	1.0	0.3
Titanium	µg/g		1	146	125	144	107	44	53	71	89
Uranium	µg/g		0.2	1.6	1.1	1.4	2.4	1.2	1.2	0.8	0.8
Vanadium	µg/g		1	44	41	48	50	42	52	43	32

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Certificate of Analysis

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Metals in Soil

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03822-02	03822-07	03822-12	03776-01	03776-02	03776-03	03776-04	03776-05
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-15	2017-07-16	2017-07-16	2017-07-16	2017-07-16	2017-07-16	2017-07-16	2017-07-16
Parameter	Unit	G / S	RDL	8565832	8565838	8565900	8565902	8565909	8565911	8565912	8565913
Zinc	µg/g		1	98	101	114	78	155	85	71	76
Zirconium	µg/g		0.1	2.6	2.3	2.8	0.7	1.0	0.6	0.6	1.0
pH 1:2	pH units		0.05	4.82	4.83	5.06	6.78	7.56	7.60	7.86	7.45

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Public Works Metals in Soil

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03776-06	03776-07
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2017-07-16	2017-07-16
Parameter	Unit	G / S	RDL	8565914	8565915
Aluminum	µg/g		10	18400	6300
Antimony	µg/g		0.1	0.7	0.2
Arsenic	µg/g		0.1	11.3	5.3
Barium	µg/g		0.5	284	282
Beryllium	µg/g		0.1	0.8	0.4
Bismuth	µg/g		0.5	<0.5	<0.5
Cadmium	µg/g		0.01	0.54	0.41
Calcium	µg/g		10	2030	27400
Chromium	µg/g		1	27	14
Cobalt	µg/g		0.1	9.0	4.8
Copper	µg/g		0.2	25.8	10.6
Iron	µg/g		10	31200	21900
Lead	µg/g		0.1	21.7	6.2
Lithium	µg/g		0.5	17.1	7.5
Magnesium	µg/g		10	3920	9860
Manganese	µg/g		1	184	230
Mercury	µg/g		0.01	0.05	0.03
Molybdenum	µg/g		0.2	1.8	1.3
Nickel	µg/g		0.5	24.1	16.0
Phosphorus	µg/g		5	619	1190
Potassium	µg/g		5	2770	1250
Selenium	µg/g		0.1	0.4	0.6
Silver	µg/g		0.5	<0.5	<0.5
Sodium	µg/g		5	54	38
Strontium	µg/g		1	37	45
Thallium	µg/g		0.1	0.2	0.1
Tin	µg/g		0.2	0.8	0.3
Titanium	µg/g		1	133	121
Uranium	µg/g		0.2	1.2	0.8
Vanadium	µg/g		1	53	28

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Public Works Metals in Soil

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03776-06	03776-07
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2017-07-16	2017-07-16
Parameter	Unit	G / S	RDL	8565914	8565915
Zinc	µg/g		1	237	54
Zirconium	µg/g		0.1	3.3	1.3
pH 1:2	pH units		0.05	4.61	7.98

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8565794-8565915 Results are based on the dry weight of the sample

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SAMPLING SITE:

SAMPLED BY:

Soil Analysis - SWEP Metals

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03796-03
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2017-07-14
Parameter	Unit	G / S	RDL	8565771
Arsenic - Leachate (SWEP)	mg/L	2.5	0.5	<0.5
Barium - Leachate (SWEP)	mg/L	100	0.5	<0.5
Boron - Leachate (SWEP)	mg/L	500	0.5	<0.5
Cadmium - Leachate (SWEP)	mg/L	0.5	0.5	<0.5
Chromium - Leachate (SWEP)	mg/L	5	0.5	<0.5
Copper - Leachate (SWEP)	mg/L	100	0.5	<0.5
Lead - Leachate (SWEP)	mg/L	5	0.5	<0.5
Mercury - Leachate (SWEP)	mg/L	0.1	0.1	<0.1
Selenium - Leachate (SWEP)	mg/L	1	0.5	<0.5
Silver - Leachate (SWEP)	mg/L	5	0.5	<0.5
Uranium - Leachate (SWEP)	mg/L	10	0.5	<0.5
Zinc - Leachate (SWEP)	mg/L	500	0.5	<0.5

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to NORTHERN ROCKIES
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8565771 Analysis based on 'as received'.

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PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Soil Salinity - Na & Cl

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03822-03	03822-07	03822-12	03776-01	03776-04	03776-07
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-15	2017-07-16	2017-07-16	2017-07-16	2017-07-16	2017-07-16
Parameter	Unit	G / S	RDL	8565833	8565838	8565900	8565902	8565912	8565915
Chloride, Soluble	mg/L		2	5	4	3	5	8	6
Sodium, Soluble	mg/L		2	5	4	3	2	3	3
Saturation Percentage	%		0.1	39.7	37.6	40.3	45.6	34.9	33.1
Chloride, Soluble (mg/kg)	mg/kg		2	2	<2	<2	2	3	2
Sodium, Soluble (mg/kg)	mg/kg		2	2	<2	<2	<2	<2	<2

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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SAMPLING SITE:

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Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03796-06	03796-07	03796-09	03796-11	03796-12	03820-03	03820-07	03820-09
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-14	2017-07-14	2017-07-14	2017-07-14	2017-07-14	2017-07-14	2017-07-14	2017-07-14
Parameter	Unit	G / S	RDL	8565794	8565799	8565802	8565805	8565806	8565809	8565813	8565815
Naphthalene	µg/g		0.005	0.022	0.026	0.020	<0.005	<0.005	<0.005	0.187	<0.005
2-Methylnaphthalene	µg/g		0.005	0.023	0.028	0.164	0.005	<0.005	<0.005	0.446	<0.005
1-Methylnaphthalene	µg/g		0.005	0.015	0.018	0.090	0.005	<0.005	<0.005	0.292	<0.005
Acenaphthylene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Fluorene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02
Phenanthrene	µg/g		0.02	<0.02	<0.02	0.04	0.02	0.02	<0.02	0.18	<0.02
Anthracene	µg/g		0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Fluoranthene	µg/g		0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.01	<0.01
Pyrene	µg/g		0.01	<0.01	<0.01	0.05	<0.01	<0.01	<0.01	0.02	<0.01
Benzo(a)anthracene	µg/g		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Chrysene	µg/g		0.05	<0.05	<0.05	0.09	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(b)fluoranthene	µg/g		0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(j)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.005	<0.005	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo(g,h,i)perylene	µg/g		0.05	<0.05	<0.05	0.12	<0.05	0.05	<0.05	0.06	<0.05
Quinoline	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
IACR CCME (Soil)	µg/g		0.6	<0.6	<0.6	0.8	<0.6	<0.6	<0.6	<0.6	<0.6
B[a]P TPE (Soil)	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EPH C10-C19	µg/g		20	34	45	121	<20	<20	<20	50	<20
EPH C19-C32	µg/g		20	152	170	174	22	26	<20	49	30
LEPH C10-C19	µg/g		20	34	44	121	<20	<20	<20	49	<20
HEPH C19-C32	µg/g		20	152	170	174	22	26	<20	49	30
Benzo(b+j)fluoranthene	µg/g		0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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ATTENTION TO: Erin O'Brien

SAMPLING SITE:

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Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:	03796-06	03796-07	03796-09	03796-11	03796-12	03820-03	03820-07	03820-09
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	2017-07-14	2017-07-14	2017-07-14	2017-07-14	2017-07-14	2017-07-14	2017-07-14	2017-07-14
Surrogate	**Unit**	**Acceptable Limits**	**8565794**	**8565799**	**8565802**	**8565805**	**8565806**	**8565809**	**8565813**	**8565815**
Naphthalene - d8	%	50-130	108	86	105	85	82	89	88	95
2-Fluorobiphenyl	%	50-130	116	92	101	86	81	88	87	96
P-Terphenyl - d14	%	60-130	128	117	108	100	97	100	95	115

Certified By:

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03820-11	03821-02	03821-04	03821-05	03821-09	03821-12	03822-01	03822-05
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-14	2017-07-15	2017-07-15	2017-07-15	2017-07-15	2017-07-15	2017-07-15	2017-07-15
Parameter	Unit	G / S	RDL	8565817	8565820	8565822	8565823	8565827	8565830	8565831	8565835
Naphthalene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.015	<0.005
2-Methylnaphthalene	µg/g		0.005	0.013	<0.005	0.026	<0.005	0.005	<0.005	0.113	<0.005
1-Methylnaphthalene	µg/g		0.005	0.016	<0.005	0.018	<0.005	0.009	<0.005	0.071	0.005
Acenaphthylene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Fluorene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02
Phenanthrene	µg/g		0.02	0.08	<0.02	0.06	<0.02	0.07	<0.02	0.13	<0.02
Anthracene	µg/g		0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Fluoranthene	µg/g		0.01	0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01
Pyrene	µg/g		0.01	0.03	<0.01	0.01	<0.01	0.07	<0.01	0.03	0.01
Benzo(a)anthracene	µg/g		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Chrysene	µg/g		0.05	0.05	<0.05	<0.05	<0.05	0.10	<0.05	<0.05	<0.05
Benzo(b)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(j)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo(g,h,i)perylene	µg/g		0.05	0.05	<0.05	<0.05	<0.05	0.11	<0.05	0.07	0.05
Quinoline	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
IACR CCME (Soil)	µg/g		0.6	0.6	<0.6	<0.6	<0.6	0.6	<0.6	<0.6	<0.6
B[a]P TPE (Soil)	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EPH C10-C19	µg/g		20	83	<20	28	<20	77	<20	47	<20
EPH C19-C32	µg/g		20	96	<20	36	<20	72	29	46	35
LEPH C10-C19	µg/g		20	83	<20	28	<20	77	<20	47	<20
HEPH C19-C32	µg/g		20	96	<20	36	<20	72	29	46	35
Benzo(b+j)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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Certificate of Analysis

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:	03820-11	03821-02	03821-04	03821-05	03821-09	03821-12	03822-01	03822-05
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	2017-07-14	2017-07-15	2017-07-15	2017-07-15	2017-07-15	2017-07-15	2017-07-15	2017-07-15
Surrogate	Unit	Acceptable Limits	8565817	8565820	8565822	8565823	8565827	8565830	8565831	8565835
Naphthalene - d8	%	50-130	89	106	87	96	73	85	90	91
2-Fluorobiphenyl	%	50-130	87	106	88	97	71	84	89	91
P-Terphenyl - d14	%	60-130	97	119	101	110	98	96	97	106

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SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03822-10	03822-11	03776-01	03776-02	03776-03		03776-04
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil		Soil
		DATE SAMPLED:		2017-07-16	2017-07-16	2017-07-16	2017-07-16	2017-07-16		2017-07-16
Parameter	Unit	G / S	RDL	8565862	8565877	8565902	8565909	8565911	RDL	8565912
Naphthalene	µg/g		0.005	0.012	0.084	<0.005	0.005	0.005	0.01	<0.01
2-Methylnaphthalene	µg/g		0.005	0.052	0.239	<0.005	0.018	0.020	0.01	<0.01
1-Methylnaphthalene	µg/g		0.005	0.039	0.156	<0.005	0.011	0.013	0.01	<0.01
Acenaphthylene	µg/g		0.005	<0.005	<0.005	<0.005	0.009	<0.005	0.01	<0.01
Acenaphthene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	<0.01
Fluorene	µg/g		0.02	<0.02	0.03	<0.02	<0.02	<0.02	0.02	<0.02
Phenanthrene	µg/g		0.02	0.11	0.16	<0.02	<0.02	0.02	0.02	0.04
Anthracene	µg/g		0.004	<0.004	<0.004	<0.004	0.006	<0.004	0.02	<0.02
Fluoranthene	µg/g		0.01	0.02	0.02	<0.01	<0.01	<0.01	0.05	<0.05
Pyrene	µg/g		0.01	0.04	0.04	<0.01	0.01	<0.01	0.02	0.05
Benzo(a)anthracene	µg/g		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.02	<0.02
Chrysene	µg/g		0.05	0.06	0.05	<0.05	<0.05	<0.05	0.05	<0.05
Benzo(b)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	<0.02
Benzo(j)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	<0.02
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	<0.02
Benzo(a)pyrene	µg/g		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.05	<0.05
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.02	<0.02
Benzo(g,h,i)perylene	µg/g		0.05	0.09	0.09	<0.05	<0.05	<0.05	0.05	<0.05
Quinoline	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05
IACR CCME (Soil)	µg/g		0.6	0.6	0.6	<0.6	<0.6	<0.6	0.6	<0.6
B[a]P TPE (Soil)	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05
EPH C10-C19	µg/g		20	46	46	<20	101	34	20	460
EPH C19-C32	µg/g		20	49	48	120	289	283	20	684
LEPH C10-C19	µg/g		20	46	46	<20	101	34	20	460
HEPH C19-C32	µg/g		20	49	48	120	289	282	20	684
Benzo(b+j)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05

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Certificate of Analysis

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:	03822-10	03822-11	03776-01	03776-02	03776-03	03776-04
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	2017-07-16	2017-07-16	2017-07-16	2017-07-16	2017-07-16	2017-07-16
Surrogate	Unit	Acceptable Limits	8565862	8565877	8565902	8565909	8565911	8565912
Naphthalene - d8	%	50-130	89	89	88	94	62	83
2-Fluorobiphenyl	%	50-130	88	88	89	92	67	86
P-Terphenyl - d14	%	60-130	100	99	104	102	75	91

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8565794-8565911 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
Soil sample is visibly heterogeneous.

8565912 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
Soil sample is visibly heterogeneous.
PAH detection limits increased. Sample extract was diluted.

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

BTEX / VPH (C6-C10) Soil

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03796-10	03796-12	03820-03	03820-07	03820-08	03820-11	03821-03	03821-09
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-14	2017-07-14	2017-07-14	2017-07-14	2017-07-14	2017-07-14	2017-07-15	2017-07-15
Parameter	**Unit**	**G / S**	**RDL**	**8565804**	**8565806**	**8565809**	**8565813**	**8565814**	**8565817**	**8565821**	**8565827**
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
m&p-Xylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
o-Xylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
VPH	µg/g		10	<10	<10	<10	12	<10	<10	<10	<10
VH	µg/g		10	<10	<10	<10	12	<10	<10	<10	<10
Total Xylenes	ug/g		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate	**Unit**	**Acceptable Limits**									
Bromofluorobenzene	%	60-140		89	98	95	96	106	98	98	93
Dibromofluoromethane	%	60-140		103	111	107	103	108	108	109	107
Toluene - d8	%	60-140		90	100	96	96	95	98	98	96

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

BTEX / VPH (C6-C10) Soil

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03821-12	03822-12	03776-07
		SAMPLE TYPE:		Soil	Soil	Soil
		DATE SAMPLED:		2017-07-15	2017-07-16	2017-07-16
Parameter	**Unit**	**G / S**	**RDL**	**8565830**	**8565900**	**8565915**
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1	<0.1	<0.1
Benzene	µg/g		0.02	<0.02	<0.02	<0.02
Toluene	µg/g		0.05	<0.05	<0.05	<0.05
Ethylbenzene	µg/g		0.05	<0.05	<0.05	<0.05
m&p-Xylene	µg/g		0.05	<0.05	<0.05	<0.05
o-Xylene	µg/g		0.05	<0.05	<0.05	<0.05
Styrene	µg/g		0.05	<0.05	<0.05	<0.05
VPH	µg/g		10	<10	<10	<10
VH	µg/g		10	<10	<10	<10
Total Xylenes	ug/g		0.1	<0.1	<0.1	<0.1
Surrogate	**Unit**	**Acceptable Limits**				
Bromofluorobenzene	%	60-140		99	94	96
Dibromofluoromethane	%	60-140		111	108	112
Toluene - d8	%	60-140		97	96	97

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8565804-8565915 Results are based on dry weight of sample.
VPH results have been corrected for BTEX contributions.

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

BTEX / VPH (C6-C10) Water

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		3809-04	3808-01	3808-02	3808-03	3808-04	3808-05
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-15	2017-07-13	2017-07-13	2017-07-13	2017-07-13	2017-07-14
Parameter	**Unit**	**G / S**	**RDL**	**8565623**	**8565629**	**8565632**	**8565682**	**8565715**	**8565752**
Methyl tert-butyl ether (MTBE)	µg/L		1	5	<1	<1	<1	<1	<1
Benzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
m&p-Xylene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
o-Xylene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Styrene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
VPH	µg/L		100	<100	<100	<100	<100	<100	<100
VH	µg/L		100	<100	<100	<100	<100	<100	<100
Total Xylenes	ug/L		1	<1	<1	<1	<1	<1	<1
Surrogate	**Unit**	**Acceptable Limits**							
Bromofluorobenzene	%	70-130		96	98	94	104	93	94
Dibromofluoromethane	%	70-130		99	104	108	107	106	109
Toluene - d8	%	70-130		99	99	95	97	95	91

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8565623-8565752 VPH results have been corrected for BTEX contributions.

Certified By:

AGAT Laboratories

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AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

DDT in Soil

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		**03821-06**
		SAMPLE TYPE:		**Soil**
		DATE SAMPLED:		**2017-07-15**
Parameter	**Unit**	**G / S**	**RDL**	**8565824**
op'-DDT	µg/g		0.005	<0.005
pp'- DDT	µg/g		0.005	<0.005
DDT (Total)	µg/g		0.007	<0.007
Moisture Content	%		0.1	19.3
Surrogate	**Unit**	**Acceptable Limits**		
TCMX	%	50-130		88
Decachlorobiphenyl	%	60-130		73

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8565824 Results are based on the dry weight of the soil.
Analysis performed at AGAT Mississauga.

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Glycols Analysis in Water

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		3809-02	3808-01	3808-02	3808-03	3808-04
		SAMPLE TYPE:		Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-15	2017-07-13	2017-07-13	2017-07-13	2017-07-13
Parameter	**Unit**	**G / S**	**RDL**	**8565536**	**8565629**	**8565632**	**8565682**	**8565715**
Propylene Glycol	mg/L		10	<10	<10	<10	<10	<10
Monoethylene Glycol	mg/L		10	<10	<10	<10	<10	<10
Diethylene Glycol	mg/L		5	<5	<5	<5	<5	<5
Triethylene Glycol	mg/L		10	<10	<10	<10	<10	<10
Tetraethylene Glycol	mg/L		10	<10	<10	<10	<10	<10
Surrogate	**Unit**	**Acceptable Limits**						
Heptanol	%	50-150		92	104	98	102	99

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8565536-8565715 Identification based on retention time relative to standards.
Analysis performed at AGAT Calgary.

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Certificate of Analysis

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Water Low Level

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		3809-01	3809-02	3809-03	3809-04	3808-01	3808-02	3808-03	3808-04
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-15	2017-07-15	2017-07-15	2017-07-15	2017-07-13	2017-07-13	2017-07-13	2017-07-13
Parameter	**Unit**	**G / S**	**RDL**	**8565518**	**8565536**	**8565586**	**8565623**	**8565629**	**8565632**	**8565682**	**8565715**
Naphthalene	µg/L		0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05
Quinoline	µg/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Acenaphthene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Fluorene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Phenanthrene	µg/L		0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acridine	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Pyrene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(a)anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(j)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenzo(a,h)anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1-Methylnaphthalene	µg/L		0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	µg/L		0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05
EPH C10-C19	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
EPH C19-C32	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
LEPH C10-C19	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
HEPH C19-C32	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
Benzo(b+j)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Surrogate	**Unit**	**Acceptable Limits**									
Naphthalene - d8	%	50-130		79	80	86	81	86	84	82	83
2-Fluorobiphenyl	%	50-130		78	80	86	77	84	84	80	82
P-Terphenyl - d14	%	60-130		75	79	84	79	73	80	79	75

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Certificate of Analysis

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Water Low Level

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

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Public Works LEPH/HEPH in Water Low Level

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		3808-05	3808-06
		SAMPLE TYPE:		Water	Water
		DATE SAMPLED:		2017-07-14	2017-07-14
Parameter	**Unit**	**G / S**	**RDL**	**8565752**	**8565760**
Naphthalene	µg/L		0.05	<0.05	<0.05
Quinoline	µg/L		0.1	<0.1	<0.1
Acenaphthylene	µg/L		0.02	<0.02	<0.02
Acenaphthene	µg/L		0.02	<0.02	<0.02
Fluorene	µg/L		0.02	<0.02	<0.02
Phenanthrene	µg/L		0.04	<0.04	<0.04
Anthracene	µg/L		0.01	<0.01	<0.01
Acridine	µg/L		0.05	<0.05	<0.05
Fluoranthene	µg/L		0.02	<0.02	<0.02
Pyrene	µg/L		0.02	<0.02	<0.02
Benzo(a)anthracene	µg/L		0.01	<0.01	<0.01
Chrysene	µg/L		0.01	<0.01	<0.01
Benzo(b)fluoranthene	µg/L		0.01	<0.01	<0.01
Benzo(j)fluoranthene	µg/L		0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L		0.01	<0.01	<0.01
Benzo(a)pyrene	µg/L		0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/L		0.01	<0.01	<0.01
Dibenzo(a,h)anthracene	µg/L		0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L		0.01	<0.01	<0.01
1-Methylnaphthalene	µg/L		0.05	<0.05	<0.05
2-Methylnaphthalene	µg/L		0.05	<0.05	<0.05
EPH C10-C19	µg/L		100	<100	<100
EPH C19-C32	µg/L		100	<100	<100
LEPH C10-C19	µg/L		100	<100	<100
HEPH C19-C32	µg/L		100	<100	<100
Benzo(b+j)fluoranthene	µg/L		0.01	<0.01	<0.01
Surrogate	**Unit**	**Acceptable Limits**		**8565752**	**8565760**
Naphthalene - d8	%	50-130		82	82
2-Fluorobiphenyl	%	50-130		81	81
P-Terphenyl - d14	%	60-130		75	80

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PROJECT: 1657709 5000

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SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Water Low Level

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8565518-8565760 LEPH & HEPH results have been corrected for PAH contributions.

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PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Toluene in Soil

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		**03796-01**	**03796-05**
		SAMPLE TYPE:		**Soil**	**Soil**
		DATE SAMPLED:		**2017-07-14**	**2017-07-14**
Parameter	**Unit**	**G / S**	**RDL**	**8565765**	**8565779**
Toluene	µg/g		0.05	<0.05	<0.05
Surrogate	**Unit**	**Acceptable Limits**			
Bromofluorobenzene	%	60-140		99	98
Dibromofluoromethane	%	60-140		109	109
Toluene - d8	%	60-140		97	102

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8565765-8565779 Results are based on dry weight of sample.

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Certificate of Analysis

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03796-06	03796-07	03820-10	03821-04	03821-05	03821-06	03822-01	03822-05
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-14	2017-07-14	2017-07-14	2017-07-15	2017-07-15	2017-07-15	2017-07-15	2017-07-15
Parameter	Unit	G / S	RDL	8565794	8565799	8565816	8565822	8565823	8565824	8565831	8565835
Chloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vinyl Chloride	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromomethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acetone	µg/g		0.5	0.8	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Butanone (MEK)	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroform	µg/g		0.05	0.07	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
1,2-Dichloropropane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethene	µg/g		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromodichloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4-Methyl-2-pentanone (MIBK)	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Toluene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylene Dibromide	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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Certificate of Analysis

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03796-06	03796-07	03820-10	03821-04	03821-05	03821-06	03822-01	03822-05
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-14	2017-07-14	2017-07-14	2017-07-15	2017-07-15	2017-07-15	2017-07-15	2017-07-15
Parameter	**Unit**	**G / S**	**RDL**	**8565794**	**8565799**	**8565816**	**8565822**	**8565823**	**8565824**	**8565831**	**8565835**
Chlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
m&p-Xylene	µg/g		0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromoform	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
o-Xylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
VH	µg/g		10	<10	<10	<10	<10	<10	<10	<10	<10
VPH	µg/g		10	<10	<10	<10	<10	<10	<10	<10	<10
Total Xylenes	µg/g		0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Surrogate	**Unit**	**Acceptable Limits**									
Bromofluorobenzene	%	60-140		111	102	100	108	108	108	104	103
Dibromofluoromethane	%	60-140		106	93	90	97	102	98	96	95
Toluene - d8	%	60-140		128	114	110	119	124	121	120	117

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SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03822-10	03776-02	03776-03
		SAMPLE TYPE:		Soil	Soil	Soil
		DATE SAMPLED:		2017-07-16	2017-07-16	2017-07-16
Parameter	Unit	G / S	RDL	8565862	8565909	8565911
Chloromethane	µg/g		0.05	<0.05	<0.05	<0.05
Vinyl Chloride	µg/g		0.05	<0.05	<0.05	<0.05
Bromomethane	µg/g		0.05	<0.05	<0.05	<0.05
Chloroethane	µg/g		0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	µg/g		0.05	<0.05	<0.05	<0.05
Acetone	µg/g		0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05
Dichloromethane	µg/g		0.05	<0.05	<0.05	<0.05
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1	<0.1	<0.1
2-Butanone (MEK)	µg/g		0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	µg/g		0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05
Chloroform	µg/g		0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	µg/g		0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	µg/g		0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	µg/g		0.02	<0.02	<0.02	<0.02
Benzene	µg/g		0.02	<0.02	<0.02	<0.02
1,2-Dichloropropane	µg/g		0.05	<0.05	<0.05	<0.05
Trichloroethene	µg/g		0.01	<0.01	<0.01	<0.01
Bromodichloromethane	µg/g		0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropene	µg/g		0.05	<0.05	<0.05	<0.05
4-Methyl-2-pentanone (MIBK)	µg/g		0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	µg/g		0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	µg/g		0.05	<0.05	<0.05	<0.05
Toluene	µg/g		0.05	<0.05	<0.05	<0.05
Dibromochloromethane	µg/g		0.05	<0.05	<0.05	<0.05
Ethylene Dibromide	µg/g		0.05	<0.05	<0.05	<0.05
Tetrachloroethene	µg/g		0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	µg/g		0.05	<0.05	<0.05	<0.05

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Certificate of Analysis

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03822-10	03776-02	03776-03
		SAMPLE TYPE:		Soil	Soil	Soil
		DATE SAMPLED:		2017-07-16	2017-07-16	2017-07-16
Parameter	**Unit**	**G / S**	**RDL**	**8565862**	**8565909**	**8565911**
Chlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05
Ethylbenzene	µg/g		0.05	<0.05	<0.05	<0.05
m&p-Xylene	µg/g		0.05	<0.05	<0.05	<0.05
Bromoform	µg/g		0.05	<0.05	<0.05	<0.05
Styrene	µg/g		0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	µg/g		0.05	<0.05	<0.05	<0.05
o-Xylene	µg/g		0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05
VH	µg/g		10	<10	<10	<10
VPH	µg/g		10	<10	<10	<10
Total Xylenes	µg/g		0.2	<0.2	<0.2	<0.2
Surrogate	**Unit**	**Acceptable Limits**				
Bromofluorobenzene	%	60-140		109	101	114
Dibromofluoromethane	%	60-140		101	90	104
Toluene - d8	%	60-140		126	112	128

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8565794-8565911 Results are based on dry weight of sample.

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PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Water

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

SAMPLE DESCRIPTION:				3809-01	3809-02	3809-03	3808-06
SAMPLE TYPE:				Water	Water	Water	Water
DATE SAMPLED:				2017-07-15	2017-07-15	2017-07-15	2017-07-14
Parameter	Unit	G / S	RDL	8565518	8565536	8565586	8565760
Chloromethane	µg/L		1	<1	<1	<1	<1
Vinyl Chloride	µg/L		1	<1	<1	<1	<1
Bromomethane	µg/L		1	<1	<1	<1	<1
Chloroethane	µg/L		1	<1	<1	<1	<1
Trichlorofluoromethane	µg/L		1	<1	<1	<1	<1
Acetone	µg/L		10	<10	<10	<10	<10
1,1-Dichloroethene	µg/L		1	<1	<1	<1	<1
Dichloromethane	µg/L		1	<1	<1	<1	<1
Methyl tert-butyl ether (MTBE)	µg/L		1	<1	<1	<1	<1
2-Butanone (MEK)	µg/L		10	<10	<10	<10	<10
trans-1,2-Dichloroethylene	µg/L		1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L		1	<1	<1	<1	<1
cis-1,2-Dichloroethylene	µg/L		1	<1	<1	<1	<1
Chloroform	µg/L		1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L		1	<1	<1	<1	<1
1,1,1-Trichloroethane	µg/L		1	<1	<1	<1	<1
Carbon Tetrachloride	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
Benzene	µg/L		0.5	<0.5	<0.5	0.5	<0.5
1,2-Dichloropropane	µg/L		1	<1	<1	<1	<1
Trichloroethene	µg/L		1	<1	<1	<1	<1
Bromodichloromethane	µg/L		1	<1	<1	<1	<1
trans-1,3-Dichloropropene	µg/L		1	<1	<1	<1	<1
4-Methyl-2-pentanone (MIBK)	µg/L		10	<10	<10	<10	<10
cis-1,3-Dichloropropene	µg/L		1	<1	<1	<1	<1
1,1,2-Trichloroethane	µg/L		1	<1	<1	<1	<1
Toluene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	µg/L		1	<1	<1	<1	<1
Ethylene Dibromide	µg/L		0.3	<0.3	<0.3	<0.3	<0.3
Tetrachloroethene	µg/L		1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	µg/L		1	<1	<1	<1	<1

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Certificate of Analysis

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Water

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		3809-01	3809-02	3809-03	3808-06
		SAMPLE TYPE:		Water	Water	Water	Water
		DATE SAMPLED:		2017-07-15	2017-07-15	2017-07-15	2017-07-14
Parameter	**Unit**	**G / S**	**RDL**	**8565518**	**8565536**	**8565586**	**8565760**
Chlorobenzene	µg/L		1	<1	<1	<1	<1
Ethylbenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
m&p-Xylene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	µg/L		1	<1	<1	<1	<1
Styrene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	µg/L		1	<1	<1	<1	<1
o-Xylene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	µg/L		1	<1	<1	<1	<1
VH	µg/L		100	<100	<100	<100	<100
VPH	µg/L		100	<100	<100	<100	<100
Total Trihalomethanes	µg/L		2	<2	<2	<2	<2
Total Xylenes	µg/L		1	<1	<1	<1	<1
Surrogate	**Unit**	**Acceptable Limits**					
Bromofluorobenzene	%	70-130		99	98	101	98
Dibromofluoromethane	%	70-130		89	88	89	91
Toluene - d8	%	70-130		107	107	107	109

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Chloride in Water

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		3809-01		3809-03	3808-01	3808-02	3808-03	3808-04
		SAMPLE TYPE:		Water		Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-15		2017-07-15	2017-07-13	2017-07-13	2017-07-13	2017-07-13
Parameter	Unit	G / S	RDL	8565518	RDL	8565586	8565629	8565632	8565682	8565715
Chloride	mg/L		0.5	103	0.05	22.3	18.9	40.7	2.26	2.51

		SAMPLE DESCRIPTION:	3808-05	3808-06	
		SAMPLE TYPE:	Water	Water	
		DATE SAMPLED:	2017-07-14	2017-07-14	
Parameter	Unit	G / S	RDL	8565752	8565760
Chloride	mg/L		0.5	106	86.9

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

SAMPLE DESCRIPTION:				3809-01	3809-02	3809-03	3809-04		3808-01		3808-02
SAMPLE TYPE:				Water	Water	Water	Water		Water		Water
DATE SAMPLED:				2017-07-15	2017-07-15	2017-07-15	2017-07-15		2017-07-13		2017-07-13
Parameter	Unit	G / S	RDL	8565518	8565536	8565586	8565623	RDL	8565629	RDL	8565632
Aluminum Dissolved	µg/L		2	7	4	3	3	2	<2	2	3
Antimony Dissolved	µg/L		0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	0.2	0.5
Arsenic Dissolved	µg/L		0.1	0.5	0.7	3.2	0.9	0.1	0.5	0.1	6.2
Barium Dissolved	µg/L		2	5200	5740	2230	5190	2	11200	0.2	82.5
Beryllium Dissolved	µg/L		0.01	<0.01	<0.01	<0.01	0.05	0.01	<0.01	0.01	<0.01
Bismuth Dissolved	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.05
Boron Dissolved	µg/L		2	129	119	82	148	2	260	2	82
Cadmium Dissolved	µg/L		0.01	<0.01	<0.01	<0.01	0.01	0.01	<0.01	0.01	0.03
Calcium Dissolved	µg/L		50	108000	90600	71600	93100	50	53600	50	44300
Chromium Dissolved	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	0.5	<0.5
Cobalt Dissolved	µg/L		0.05	0.98	0.26	0.73	2.35	0.05	0.15	0.05	1.27
Copper Dissolved	µg/L		0.2	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.4
Iron Dissolved	µg/L		10	10700	8660	23400	12300	10	744	10	18100
Lead Dissolved	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.05
Lithium Dissolved	µg/L		0.5	78.4	71.8	60.4	78.5	2.5	213	0.5	75.2
Magnesium Dissolved	µg/L		50	33900	29100	27900	29000	50	28200	50	16500
Manganese Dissolved	µg/L		1	708	280	92	431	1	676	1	1640
Mercury Dissolved	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01
Molybdenum Dissolved	µg/L		0.05	0.08	0.17	2.04	0.30	0.05	0.06	0.05	1.60
Nickel Dissolved	µg/L		0.2	3.9	0.5	2.7	0.6	0.2	0.3	0.2	6.1
Potassium Dissolved	µg/L		50	1870	1640	1930	3050	50	1890	50	1400
Selenium Dissolved	µg/L		0.5	0.7	0.7	0.5	0.6	0.5	1.0	0.5	<0.5
Silicon Dissolved	µg/L		50	5540	5460	5120	6500	50	2390	50	5610
Silver Dissolved	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.02	<0.02
Sodium Dissolved	µg/L		50	13300	13000	6810	18100	50	19300	50	26100
Strontium Dissolved	µg/L		0.1	625	498	374	467	0.1	1360	0.1	157
Sulphur Dissolved	µg/L		500	5150	1170	1590	2060	500	630	500	9920
Thallium Dissolved	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01
Tin Dissolved	µg/L		0.05	<0.05	<0.05	<0.05	0.13	0.05	<0.05	0.05	0.11
Titanium Dissolved	µg/L		0.5	2.7	2.7	3.0	2.8	0.5	2.1	0.5	2.3

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Certificate of Analysis

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		3809-01	3809-02	3809-03	3809-04		3808-01		3808-02
		SAMPLE TYPE:		Water	Water	Water	Water		Water		Water
		DATE SAMPLED:		2017-07-15	2017-07-15	2017-07-15	2017-07-15		2017-07-13		2017-07-13
Parameter	Unit	G / S	RDL	8565518	8565536	8565586	8565623	RDL	8565629	RDL	8565632
Uranium Dissolved	µg/L		0.01	0.08	0.07	0.08	1.11	0.01	0.03	0.01	1.18
Vanadium Dissolved	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	0.5	0.5
Zinc Dissolved	µg/L		2	11	4	5	3	2	7	2	3
Zirconium Dissolved	µg/L		0.1	<0.1	<0.1	<0.1	0.1	0.1	<0.1	0.1	0.1
Hardness (calc)	ug CaCO3/L		100	409000	346000	294000	352000	100	250000	100	179000

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SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		3808-03	3808-04	3808-05	3808-06
		SAMPLE TYPE:		Water	Water	Water	Water
		DATE SAMPLED:		2017-07-13	2017-07-13	2017-07-14	2017-07-14
Parameter	Unit	G / S	RDL	8565682	8565715	8565752	8565760
Aluminum Dissolved	µg/L		2	<2	5	<2	6
Antimony Dissolved	µg/L		0.2	<0.2	<0.2	<0.2	<0.2
Arsenic Dissolved	µg/L		0.1	1.4	2.1	<0.1	<0.1
Barium Dissolved	µg/L		2	295	241	10300	10400
Beryllium Dissolved	µg/L		0.01	<0.01	<0.01	<0.01	<0.01
Bismuth Dissolved	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
Boron Dissolved	µg/L		2	117	104	126	138
Cadmium Dissolved	µg/L		0.01	<0.01	<0.01	<0.01	<0.01
Calcium Dissolved	µg/L		50	29000	29700	118000	109000
Chromium Dissolved	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
Cobalt Dissolved	µg/L		0.05	1.06	2.81	<0.05	<0.05
Copper Dissolved	µg/L		0.2	<0.2	0.4	<0.2	<0.2
Iron Dissolved	µg/L		10	13900	7760	4980	4870
Lead Dissolved	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
Lithium Dissolved	µg/L		0.5	70.3	63.4	76.2	75.5
Magnesium Dissolved	µg/L		50	11600	11200	35000	33700
Manganese Dissolved	µg/L		1	524	692	493	546
Mercury Dissolved	µg/L		0.01	<0.01	<0.01	0.01	<0.01
Molybdenum Dissolved	µg/L		0.05	0.24	0.31	<0.05	<0.05
Nickel Dissolved	µg/L		0.2	2.2	5.8	<0.2	<0.2
Potassium Dissolved	µg/L		50	946	1300	2090	1990
Selenium Dissolved	µg/L		0.5	<0.5	0.7	0.6	0.8
Silicon Dissolved	µg/L		50	4860	4700	4950	5040
Silver Dissolved	µg/L		0.02	<0.02	<0.02	<0.02	<0.02
Sodium Dissolved	µg/L		50	16100	16700	20800	16200
Strontium Dissolved	µg/L		0.1	150	154	939	937
Sulphur Dissolved	µg/L		500	2240	2050	2990	1770
Thallium Dissolved	µg/L		0.01	<0.01	<0.01	<0.01	<0.01
Tin Dissolved	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
Titanium Dissolved	µg/L		0.5	3.8	3.0	2.3	2.2

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PROJECT: 1657709 5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-07-18

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		3808-03	3808-04	3808-05	3808-06
		SAMPLE TYPE:		Water	Water	Water	Water
		DATE SAMPLED:		2017-07-13	2017-07-13	2017-07-14	2017-07-14
Parameter	Unit	G / S	RDL	8565682	8565715	8565752	8565760
Uranium Dissolved	µg/L		0.01	0.01	0.49	<0.01	<0.01
Vanadium Dissolved	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
Zinc Dissolved	µg/L		2	<2	4	6	6
Zirconium Dissolved	µg/L		0.1	<0.1	<0.1	<0.1	<0.1
Hardness (calc)	ug CaCO3/L		100	120000	120000	439000	411000

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Soil Analysis

RPT Date: Aug 24, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Public Works Metals in Soil															
Aluminum	8572949		34700	37600	8.3%	< 10	97%	70%	130%	100%	90%	110%			
Antimony	8572949		0.1	0.1	NA	< 0.1	94%	70%	130%	92%	90%	110%			
Arsenic	8572949		3.9	4.0	1.5%	< 0.1	97%	70%	130%	93%	90%	110%			
Barium	8572949		217	235	8.0%	< 0.5	94%	70%	130%	93%	90%	110%			
Beryllium	8572949		0.4	0.4	NA	< 0.1	83%	70%	130%	92%	90%	110%			
Bismuth	8572949		<0.5	<0.5	NA	< 0.5				93%	85%	115%			
Cadmium	8572949		0.15	0.16	7.3%	< 0.01	86%	70%	130%	93%	90%	110%			
Calcium	8572949		3050	3190	4.5%	< 10	103%	70%	130%	101%	90%	110%			
Chromium	8572949		27	27	1.2%	< 1	100%	70%	130%	97%	90%	110%			
Cobalt	8572949		10.8	11.4	5.7%	< 0.1	99%	70%	130%	97%	90%	110%			
Copper	8572949		26.0	27.8	6.9%	< 0.2	95%	70%	130%	98%	90%	110%			
Iron	8572949		29200	32800	11.6%	< 10	100%	70%	130%	103%	90%	110%			
Lead	8572949		5.3	5.7	6.0%	< 0.1	86%	70%	130%	98%	90%	110%			
Lithium	8572949		10.5	10.6	1.0%	< 0.5				97%	85%	115%			
Magnesium	8572949		6860	7260	5.5%	< 10	105%	70%	130%	100%	90%	110%			
Manganese	8572949		457	519	12.6%	< 1	92%	70%	130%	96%	90%	110%			
Mercury	8572949		0.04	0.04	NA	< 0.01	81%	70%	130%	97%	90%	110%			
Molybdenum	8572949		0.6	0.6	NA	< 0.2	76%	70%	130%	95%	90%	110%			
Nickel	8572949		17.3	17.3	0.2%	< 0.5	98%	70%	130%	97%	90%	110%			
Phosphorus	8572949		317	314	1.1%	< 5	90%	70%	130%	100%	90%	110%			
Potassium	8572949		1200	1290	7.7%	< 5	114%	70%	130%	105%	90%	110%			
Selenium	8572949		0.3	0.4	NA	< 0.1				95%	90%	110%			
Silver	8572949		<0.5	<0.5	NA	< 0.5	104%	70%	130%	100%	90%	110%			
Sodium	8572949		268	259	3.2%	< 5	124%	70%	130%	101%	90%	110%			
Strontium	8572949		38	40	5.1%	< 1	104%	70%	130%	102%	90%	110%			
Thallium	8572949		<0.1	<0.1	NA	< 0.1	95%	70%	130%	97%	90%	110%			
Tin	8572949		0.5	0.5	NA	< 0.2	85%	70%	130%	96%	90%	110%			
Titanium	8572949		1810	1950	7.7%	< 1				103%	90%	110%			
Uranium	8572949		0.7	0.7	NA	< 0.2	87%	70%	130%	96%	90%	110%			
Vanadium	8572949		78	84	8.0%	< 1	104%	70%	130%	101%	90%	110%			
Zinc	8572949		47	49	3.4%	< 1	96%	70%	130%	93%	90%	110%			
Zirconium	8572949		4.9	5.4	10.1%	< 0.1				98%	90%	110%			
pH 1:2	8565838		4.83	4.86	0.6%		100%	90%	110%	99%	95%	105%			

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Soil Salinity - Na & Cl															
Chloride, Soluble	8565833	2016-1	1433	1432	0.1%	< 2	86%	80%	120%	102%	85%	115%			
Sodium, Soluble	8565833	2016-1	591	592	0.2%	< 2	110%	80%	120%	102%	85%	115%			
Saturation Percentage	8565833	2016-1	39.2	39.7	1.3%		98%	80%	120%						

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Soil Analysis (Continued)

RPT Date: Aug 24, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Soil Analysis - (SWEP), NO2,NO3, Cyanide,Flouride															
Fluoride - Leachate (SWEP)	8601475		<0.5	<0.5	NA	< 0.5	104%	80%	120%				110%	80%	120%
Nitrate - Leachate (SWEP)	8601475		<0.5	<0.5	NA	< 0.5	103%	80%	120%				106%	80%	120%
Nitrite - Leachate (SWEP)	8601475		<0.5	<0.5	NA	< 0.5	100%	80%	120%				100%	80%	120%
Cyanide - Leachate (SWEP)	8654164		<0.002	<0.002	NA	< 0.002	114%	80%	120%	100%	80%	120%	105%	80%	120%
(SWEP) Metals															
Arsenic - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	86%	80%	120%	115%	80%	120%	108%	80%	120%
Barium - Leachate (SWEP)	8738785		1.0	1.1	NA	< 0.5	92%	80%	120%	111%	80%	120%	NA	80%	120%
Boron - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	77%	80%	120%	101%	80%	120%	NA	80%	120%
Cadmium - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	91%	80%	120%	104%	80%	120%	103%	80%	120%
Chromium - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	92%	80%	120%	106%	80%	120%	104%	80%	120%
Copper - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	92%	80%	120%	108%	80%	120%	108%	80%	120%
Lead - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	91%	80%	120%	101%	80%	120%	100%	80%	120%
Mercury - Leachate (SWEP)	8738785		<0.1	<0.1	NA	< 0.1	96%	80%	120%	97%	80%	120%	108%	80%	120%
Selenium - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	84%	80%	120%	118%	80%	120%	109%	80%	120%
Silver - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	89%	80%	120%	93%	80%	120%	93%	80%	120%
Uranium - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	92%	80%	120%	97%	80%	120%	98%	80%	120%
Zinc - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	92%	80%	120%	109%	80%	120%	106%	80%	120%
Soil Analysis - SWEP Metals															
Arsenic - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	86%	80%	120%	115%	80%	120%	108%	80%	120%
Barium - Leachate (SWEP)	8738785		1.0	1.1	NA	< 0.5	92%	80%	120%	111%	80%	120%	NA	80%	120%
Boron - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	77%	80%	120%	101%	80%	120%	NA	80%	120%
Cadmium - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	91%	80%	120%	104%	80%	120%	103%	80%	120%
Chromium - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	92%	80%	120%	106%	80%	120%	104%	80%	120%
Copper - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	92%	80%	120%	108%	80%	120%	108%	80%	120%
Lead - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	91%	80%	120%	101%	80%	120%	100%	80%	120%
Mercury - Leachate (SWEP)	8738785		<0.1	<0.1	NA	< 0.1	96%	80%	120%	97%	80%	120%	108%	80%	120%
Selenium - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	84%	80%	120%	118%	80%	120%	109%	80%	120%
Silver - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	89%	80%	120%	93%	80%	120%	93%	80%	120%
Uranium - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	92%	80%	120%	97%	80%	120%	98%	80%	120%
Zinc - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	92%	80%	120%	109%	80%	120%	106%	80%	120%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.
With multi element scans it is acceptable for a maximum of 10% (including non-reported elements) of each QC criteria to fail to an absolute maximum of 10%.

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Soil Analysis (Continued)

RPT Date: Aug 24, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.
With multi element scans it is acceptable for a maximum of 10% (including non-reported elements) of each QC criteria to fail to an absolute maximum of 10%.

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Trace Organics Analysis

RPT Date: Aug 24, 2017

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Public Works LEPH/HEPH in Water Low Level															
Naphthalene	67508	W-MS	0.41	0.43	4.8%	< 0.05	101%	80%	120%				84%	50%	130%
Quinoline	67508	W-MS	0.6	0.5	18.2%	< 0.1	101%	80%	120%				125%	50%	130%
Acenaphthylene	67508	W-MS	0.44	0.44	0.0%	< 0.02	101%	80%	120%				90%	50%	130%
Acenaphthene	67508	W-MS	0.48	0.48	0.0%	< 0.02	101%	80%	120%				97%	50%	130%
Fluorene	67508	W-MS	0.47	0.47	0.0%	< 0.02	101%	80%	120%				94%	50%	130%
Phenanthrene	67508	W-MS	0.50	0.48	4.1%	< 0.04	100%	80%	120%				101%	60%	130%
Anthracene	67508	W-MS	0.49	0.47	4.2%	< 0.01	101%	80%	120%				100%	60%	130%
Acridine	67508	W-MS	0.60	0.62	3.3%	< 0.05	100%	80%	120%				122%	50%	130%
Fluoranthene	67508	W-MS	0.52	0.49	5.9%	< 0.02	100%	80%	120%				104%	60%	130%
Pyrene	67508	W-MS	0.50	0.51	2.0%	< 0.02	100%	80%	120%				100%	60%	130%
Benzo(a)anthracene	67508	W-MS	0.45	0.44	2.2%	< 0.01	100%	80%	120%				91%	60%	130%
Chrysene	67508	W-MS	0.53	0.52	1.9%	< 0.01	103%	80%	120%				107%	60%	130%
Benzo(b)fluoranthene	67508	W-MS	0.41	0.39	5.0%	< 0.01	101%	80%	120%				83%	60%	130%
Benzo(j)fluoranthene	67508	W-MS	0.55	0.53	3.7%	< 0.01	100%	80%	120%				110%	60%	130%
Benzo(k)fluoranthene	67508	W-MS	0.49	0.49	0.0%	< 0.01	99%	80%	120%				99%	60%	130%
Benzo(a)pyrene	67508	W-MS	0.51	0.47	8.2%	< 0.01	100%	80%	120%				103%	60%	130%
Indeno(1,2,3-c,d)pyrene	67508	W-MS	0.41	0.40	2.5%	< 0.01	100%	80%	120%				83%	60%	130%
Dibenzo(a,h)anthracene	67508	W-MS	0.38	0.37	2.7%	< 0.01	100%	80%	120%				77%	60%	130%
Benzo(g,h,i)perylene	67508	W-MS	0.46	0.45	2.2%	< 0.01	100%	80%	120%				93%	60%	130%
1-Methylnaphthalene	67508	W-MS	0.41	0.43	4.8%	< 0.05	100%	80%	120%				83%	50%	130%
2-Methylnaphthalene	67508	W-MS	0.37	0.39	5.3%	< 0.05	100%	80%	120%				75%	50%	130%
EPH C10-C19	67508	W-MS	8420	8200	2.6%	< 100	105%	70%	130%				83%	70%	130%
EPH C19-C32	67508	W-MS	10500	10100	3.9%	< 100	101%	70%	130%				89%	70%	130%
Naphthalene - d8	67508	W-MS	84	76	10.0%		100%	80%	120%				84%	50%	130%
2-Fluorobiphenyl	67508	W-MS	85	78	8.6%		101%	80%	120%				85%	50%	130%
P-Terphenyl - d14	67508	W-MS	91	70	26.1%		101%	80%	120%				92%	60%	130%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

BTEX / VPH (C6-C10) Water															
Methyl tert-butyl ether (MTBE)	67509	8565683	<1	<1	NA	< 1	101%	80%	120%				96%	70%	130%
Benzene	67509	8565683	1.6	1.6	NA	< 0.5	100%	80%	120%				92%	70%	130%
Toluene	67509	8565683	<0.5	<0.5	NA	< 0.5	100%	80%	120%				91%	70%	130%
Ethylbenzene	67509	8565683	0.7	0.8	NA	< 0.5	101%	80%	120%				91%	70%	130%
m&p-Xylene	67509	8565683	5.3	5.9	10.7%	< 0.5	99%	80%	120%				89%	70%	130%
o-Xylene	67509	8565683	9.4	10.0	6.2%	< 0.5	101%	80%	120%				91%	70%	130%
Styrene	67509	8565683	<0.5	<0.5	NA	< 0.5	100%	80%	120%				97%	70%	130%
VPH	67509	8565683	240	260	NA	< 100									
VH	67509	8565683	260	280	NA	< 100									
Bromofluorobenzene	67509	8565683	103	104	1.0%		101%	70%	130%				101%	70%	130%

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Trace Organics Analysis (Continued)

RPT Date: Aug 24, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Dibromofluoromethane	67509	8565683	110	104	5.6%		102%	70%	130%				103%	70%	130%
Toluene - d8	67509	8565683	93	96	3.2%		99%	70%	130%				100%	70%	130%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Public Works LEPH/HEPH in Soil Low Level

Naphthalene	67503	8565805	<0.005	<0.005	NA	< 0.005	100%	80%	120%				91%	50%	130%
2-Methylnaphthalene	67503	8565805	0.005	<0.005	NA	< 0.005	100%	80%	120%				83%	50%	130%
1-Methylnaphthalene	67503	8565805	0.005	0.005	NA	< 0.005	100%	80%	120%				84%	50%	130%
Acenaphthylene	67503	8565805	<0.005	<0.005	NA	< 0.005	100%	80%	120%				84%	50%	130%
Acenaphthene	67503	8565805	<0.005	<0.005	NA	< 0.005	101%	80%	120%				92%	50%	130%
Fluorene	67503	8565805	<0.02	<0.02	NA	< 0.02	100%	80%	120%				88%	50%	130%
Phenanthrene	67503	8565805	0.02	0.02	NA	< 0.02	101%	80%	120%				81%	60%	130%
Anthracene	67503	8565805	<0.004	<0.004	NA	< 0.004	98%	80%	120%				84%	60%	130%
Fluoranthene	67503	8565805	<0.01	<0.01	NA	< 0.01	100%	80%	120%				82%	60%	130%
Pyrene	67503	8565805	<0.01	<0.01	NA	< 0.01	100%	80%	120%				82%	60%	130%
Benzo(a)anthracene	67503	8565805	<0.03	<0.03	NA	< 0.03	101%	80%	120%				75%	60%	130%
Chrysene	67503	8565805	<0.05	<0.05	NA	< 0.05	100%	80%	120%				82%	60%	130%
Benzo(b)fluoranthene	67503	8565805	<0.05	<0.05	NA	< 0.05	103%	80%	120%				73%	60%	130%
Benzo(j)fluoranthene	67503	8565805	<0.05	<0.05	NA	< 0.05	102%	80%	120%				83%	60%	130%
Benzo(k)fluoranthene	67503	8565805	<0.05	<0.05	NA	< 0.05	96%	80%	120%				78%	60%	130%
Benzo(a)pyrene	67503	8565805	<0.03	<0.03	NA	< 0.03	100%	80%	120%				88%	60%	130%
Indeno(1,2,3-c,d)pyrene	67503	8565805	<0.02	<0.02	NA	< 0.02	99%	80%	120%				73%	60%	130%
Dibenzo(a,h)anthracene	67503	8565805	<0.005	<0.005	NA	< 0.005	100%	80%	120%				85%	60%	130%
Benzo(g,h,i)perylene	67503	8565805	<0.05	<0.05	NA	< 0.05	100%	80%	120%				76%	60%	130%
Quinoline	67503	8565805	<0.05	<0.05	NA	< 0.05	100%	80%	120%				112%	50%	130%
EPH C10-C19	67503	8565805	<20	<20	NA	< 20	105%	70%	130%				92%	65%	120%
EPH C19-C32	67503	8565805	22	25	NA	< 20	104%	70%	130%				90%	80%	120%
Naphthalene - d8	67503	8565805	85	88	3.5%		100%	80%	120%				84%	50%	130%
2-Fluorobiphenyl	67503	8565805	86	88	2.3%		102%	80%	120%				78%	50%	130%
P-Terphenyl - d14	67503	8565805	100	102	2.0%		101%	80%	120%				82%	60%	130%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Volatile Organic Compounds in Soil

Chloromethane	67518	8567634	<0.05	<0.05	NA	< 0.05	90%	80%	120%				108%	60%	140%
Vinyl Chloride	67518	8567634	<0.05	<0.05	NA	< 0.05	97%	80%	120%				108%	60%	140%
Bromomethane	67518	8567634	<0.05	<0.05	NA	< 0.05	90%	80%	120%				111%	60%	140%
Chloroethane	67518	8567634	<0.05	<0.05	NA	< 0.05	95%	80%	120%				103%	60%	140%
Trichlorofluoromethane	67518	8567634	<0.05	<0.05	NA	< 0.05	90%	80%	120%				98%	70%	130%
Acetone	67518	8567634	<0.5	<0.5	NA	< 0.5	106%	80%	120%				116%	70%	130%
1,1-Dichloroethene	67518	8567634	<0.05	<0.05	NA	< 0.05	90%	80%	120%				98%	70%	130%
Dichloromethane	67518	8567634	<0.05	<0.05	NA	< 0.05	98%	80%	120%				103%	70%	130%

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Aug 24, 2017

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Methyl tert-butyl ether (MTBE)	67518	8567634	<0.1	<0.1	NA	< 0.1	99%	80%	120%				102%	70%	130%
2-Butanone (MEK)	67518	8567634	<0.5	<0.5	NA	< 0.5	101%	80%	120%				97%	70%	130%
trans-1,2-Dichloroethene	67518	8567634	<0.05	<0.05	NA	< 0.05	93%	80%	120%				98%	70%	130%
1,1-Dichloroethane	67518	8567634	<0.05	<0.05	NA	< 0.05	95%	80%	120%				100%	70%	130%
cis-1,2-Dichloroethene	67518	8567634	<0.05	<0.05	NA	< 0.05	94%	80%	120%				97%	70%	130%
Chloroform	67518	8567634	<0.05	<0.05	NA	< 0.05	94%	80%	120%				97%	70%	130%
1,2-Dichloroethane	67518	8567634	<0.05	<0.05	NA	< 0.05	100%	80%	120%				102%	70%	130%
1,1,1-Trichloroethane	67518	8567634	<0.05	<0.05	NA	< 0.05	92%	80%	120%				92%	70%	130%
Carbon Tetrachloride	67518	8567634	<0.02	<0.02	NA	< 0.02	90%	80%	120%				88%	70%	130%
Benzene	67518	8567634	<0.02	<0.02	NA	< 0.02	94%	80%	120%				99%	70%	130%
1,2-Dichloropropane	67518	8567634	<0.05	<0.05	NA	< 0.05	95%	80%	120%				98%	70%	130%
Trichloroethene	67518	8567634	<0.01	<0.01	NA	< 0.01	89%	80%	120%				93%	70%	130%
Bromodichloromethane	67518	8567634	<0.05	<0.05	NA	< 0.05	97%	80%	120%				94%	70%	130%
trans-1,3-Dichloropropene	67518	8567634	<0.05	<0.05	NA	< 0.05	98%	80%	120%				92%	60%	140%
4-Methyl-2-pentanone (MIBK)	67518	8567634	<0.5	<0.5	NA	< 0.5	100%	80%	120%				95%	70%	130%
cis-1,3-Dichloropropene	67518	8567634	<0.05	<0.05	NA	< 0.05	96%	80%	120%				91%	60%	140%
1,1,2-Trichloroethane	67518	8567634	<0.05	<0.05	NA	< 0.05	98%	80%	120%				98%	70%	130%
Toluene	67518	8567634	<0.05	<0.05	NA	< 0.05	94%	80%	120%				99%	70%	130%
Dibromochloromethane	67518	8567634	<0.05	<0.05	NA	< 0.05	94%	80%	120%				87%	70%	130%
Ethylene Dibromide	67518	8567634	<0.05	<0.05	NA	< 0.05	98%	80%	120%				97%	70%	130%
Tetrachloroethene	67518	8567634	<0.05	<0.05	NA	< 0.05	87%	80%	120%				86%	70%	130%
1,1,1,2-Tetrachloroethane	67518	8567634	<0.05	<0.05	NA	< 0.05	94%	80%	120%				91%	70%	130%
Chlorobenzene	67518	8567634	<0.05	<0.05	NA	< 0.05	94%	80%	120%				95%	70%	130%
Ethylbenzene	67518	8567634	<0.05	<0.05	NA	< 0.05	94%	80%	120%				96%	70%	130%
m&p-Xylene	67518	8567634	<0.05	<0.05	NA	< 0.05	94%	80%	120%				98%	70%	130%
Bromoform	67518	8567634	<0.05	<0.05	NA	< 0.05	95%	80%	120%				85%	70%	130%
Styrene	67518	8567634	<0.05	<0.05	NA	< 0.05	96%	80%	120%				96%	70%	130%
1,1,2,2-Tetrachloroethane	67518	8567634	<0.05	<0.05	NA	< 0.05	100%	80%	120%				104%	70%	130%
o-Xylene	67518	8567634	<0.05	<0.05	NA	< 0.05	95%	80%	120%				102%	70%	130%
1,3-Dichlorobenzene	67518	8567634	<0.05	<0.05	NA	< 0.05	92%	80%	120%				91%	70%	130%
1,4-Dichlorobenzene	67518	8567634	<0.05	<0.05	NA	< 0.05	93%	80%	120%				92%	70%	130%
1,2-Dichlorobenzene	67518	8567634	<0.05	<0.05	NA	< 0.05	96%	80%	120%				97%	70%	130%
1,2,4-Trichlorobenzene	67518	8567634	<0.05	<0.05	NA	< 0.05	93%	80%	120%				89%	70%	130%
Bromofluorobenzene	67518	8567634	92	99	7.3%		109%	60%	140%				98%	60%	140%
Dibromofluoromethane	67518	8567634	91	97	6.4%		92%	60%	140%				87%	60%	140%
Toluene - d8	67518	8567634	111	120	7.8%		104%	60%	140%				96%	60%	140%
VH	67518	8567634	<10	<10	NA	< 10									
VPH	67518	8567634	<10	<10	NA	< 10									

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PROJECT: 1657709 5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Aug 24, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
Public Works LEPH/HEPH in Soil Low Level															
EPH C10-C19	67515	8565912	460	462	0.4%	< 20	105%	70%	130%				83%	65%	120%
EPH C19-C32	67515	8565912	684	792	14.6%	< 20	104%	70%	130%				83%	80%	120%
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
BTEX / VPH (C6-C10) Soil															
Methyl tert-butyl ether (MTBE)	67525	8565814	< 0.1	< 0.1	0.0%	< 0.1	97%	80%	120%				98%	70%	130%
Benzene	67525	8565814	< 0.02	< 0.02	0.0%	< 0.02	100%	80%	120%				98%	70%	130%
Toluene	67525	8565814	< 0.05	< 0.05	0.0%	< 0.05	99%	80%	120%				96%	70%	130%
Ethylbenzene	67525	8565814	< 0.05	< 0.05	0.0%	< 0.05	100%	80%	120%				95%	70%	130%
m&p-Xylene	67525	8565814	< 0.05	< 0.05	0.0%	< 0.05	100%	80%	120%				96%	70%	130%
o-Xylene	67525	8565814	< 0.05	< 0.05	0.0%	< 0.05	100%	80%	120%				96%	70%	130%
Styrene	67525	8565814	< 0.05	< 0.05	0.0%	< 0.05	100%	80%	120%				102%	70%	130%
VPH	67525	8565814	< 10	< 10	0.0%	< 10									
VH	67525	8565814	< 10	< 10	0.0%	< 10									
Bromofluorobenzene	67525	8565814	106	97	8.9%		102%	60%	140%				95%	60%	140%
Dibromofluoromethane	67525	8565814	108	112	3.6%		100%	60%	140%				101%	60%	140%
Toluene - d8	67525	8565814	95	99	4.1%		100%	60%	140%				92%	60%	140%
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
Glycols Analysis in Water															
Propylene Glycol	103	8565629	<10	<10	NA	< 10	108%	70%	130%	105%	70%	130%	108%	60%	140%
Monoethylene Glycol	103	8565629	<10	<10	NA	< 10	108%	70%	130%	102%	70%	130%	105%	60%	140%
Diethylene Glycol	103	8565629	<5	<5	NA	< 5	108%	70%	130%	105%	70%	130%	108%	60%	140%
Triethylene Glycol	103	8565629	<10	<10	NA	< 10	105%	70%	130%	104%	70%	130%	105%	60%	140%
Tetraethylene Glycol	103	8565629	<10	<10	NA	< 10	105%	70%	130%	101%	70%	130%	104%	60%	140%
Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.															
Public Works LEPH/HEPH in Soil Low Level															
Naphthalene	67515	8565912	<0.01	<0.01	NA	< 0.005	101%	80%	120%				107%	50%	130%
2-Methylnaphthalene	67515	8565912	<0.01	<0.01	NA	< 0.005	101%	80%	120%				95%	50%	130%
1-Methylnaphthalene	67515	8565912	<0.01	<0.01	NA	< 0.005	100%	80%	120%				102%	50%	130%
Acenaphthylene	67515	8565912	<0.01	<0.01	NA	< 0.005	101%	80%	120%				93%	50%	130%
Acenaphthene	67515	8565912	<0.01	<0.01	NA	< 0.005	100%	80%	120%				105%	50%	130%
Fluorene	67515	8565912	<0.02	<0.02	NA	< 0.02	101%	80%	120%				98%	50%	130%
Phenanthrene	67515	8565912	0.04	0.04	NA	< 0.02	100%	80%	120%				99%	60%	130%
Anthracene	67515	8565912	<0.02	<0.02	NA	< 0.004	101%	80%	120%				105%	60%	130%
Fluoranthene	67515	8565912	<0.05	<0.05	NA	< 0.01	100%	80%	120%				103%	60%	130%
Pyrene	67515	8565912	0.05	0.05	NA	< 0.01	100%	80%	120%				104%	60%	130%

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Trace Organics Analysis (Continued)

RPT Date: Aug 24, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Benzo(a)anthracene	67515	8565912	<0.02	<0.02	NA	< 0.03	100%	80%	120%				85%	60%	130%
Chrysene	67515	8565912	<0.05	<0.05	NA	< 0.05	99%	80%	120%				104%	60%	130%
Benzo(b)fluoranthene	67515	8565912	<0.02	<0.02	NA	< 0.05	104%	80%	120%				76%	60%	130%
Benzo(j)fluoranthene	67515	8565912	<0.02	<0.02	NA	< 0.05	100%	80%	120%				106%	60%	130%
Benzo(k)fluoranthene	67515	8565912	<0.02	<0.02	NA	< 0.05	96%	80%	120%				92%	60%	130%
Benzo(a)pyrene	67515	8565912	<0.05	<0.05	NA	< 0.03	99%	80%	120%				93%	60%	130%
Indeno(1,2,3-c,d)pyrene	67515	8565912	<0.02	<0.02	NA	< 0.02	101%	80%	120%				80%	60%	130%
Dibenzo(a,h)anthracene	67515	8565912	<0.02	<0.02	NA	< 0.005	101%	80%	120%				85%	60%	130%
Benzo(g,h,i)perylene	67515	8565912	<0.05	<0.05	NA	< 0.05	100%	80%	120%				93%	60%	130%
Quinoline	67515	8565912	<0.05	<0.05	NA	< 0.05	100%	80%	120%				119%	50%	130%
Naphthalene - d8	67515	8565912	83	83	0.0%		101%	80%	120%				102%	50%	130%
2-Fluorobiphenyl	67515	8565912	86	86	0.0%		100%	80%	120%				102%	50%	130%
P-Terphenyl - d14	67515	8565912	91	91	0.0%		99%	80%	120%				103%	60%	130%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

DDT in Soil

op'-DDT	8573498		< 0.005	< 0.005	NA	< 0.005	96%	60%	140%	86%	60%	140%	99%	60%	140%
pp'- DDT	8573498		< 0.005	< 0.005	NA	< 0.005	94%	60%	140%	80%	60%	140%	95%	60%	140%
DDT (Total)	8573498		< 0.007	< 0.007	NA	< 0.007	95%	60%	140%	83%	60%	140%	97%	60%	140%

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Volatile Organic Compounds in Water

Chloromethane	67509	8565518	<1	<1	NA	< 1	99%	80%	120%				110%	70%	130%
Vinyl Chloride	67509	8565518	<1	<1	NA	< 1	100%	80%	120%				109%	70%	130%
Bromomethane	67509	8565518	<1	<1	NA	< 1	107%	80%	120%				92%	70%	130%
Chloroethane	67509	8565518	<1	<1	NA	< 1	100%	80%	120%				108%	70%	130%
Trichlorofluoromethane	67509	8565518	<1	<1	NA	< 1	100%	80%	120%				100%	70%	130%
Acetone	67509	8565518	<10	<10	NA	< 10	100%	80%	120%						
1,1-Dichloroethene	67509	8565518	<1	<1	NA	< 1	100%	80%	120%				112%	70%	130%
Dichloromethane	67509	8565518	<1	<1	NA	< 1	100%	80%	120%				96%	70%	130%
Methyl tert-butyl ether (MTBE)	67509	8565518	<1	<1	NA	< 1	100%	80%	120%				102%	70%	130%
2-Butanone (MEK)	67509	8565518	<10	<10	NA	< 10	100%	80%	120%						
trans-1,2-Dichloroethylene	67509	8565518	<1	<1	NA	< 1	100%	80%	120%				107%	70%	130%
1,1-Dichloroethane	67509	8565518	<1	<1	NA	< 1	100%	80%	120%				107%	70%	130%
cis-1,2-Dichloroethylene	67509	8565518	<1	<1	NA	< 1	100%	80%	120%				103%	70%	130%
Chloroform	67509	8565518	<1	<1	NA	< 1	100%	80%	120%				104%	70%	130%
1,2-Dichloroethane	67509	8565518	<1	<1	NA	< 1	100%	80%	120%				103%	70%	130%
1,1,1-Trichloroethane	67509	8565518	<1	<1	NA	< 1	100%	80%	120%				103%	70%	130%
Carbon Tetrachloride	67509	8565518	<0.5	<0.5	NA	< 0.5	101%	80%	120%				104%	70%	130%
Benzene	67509	8565518	<0.5	<0.5	NA	< 0.5	100%	80%	120%				104%	70%	130%

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Trace Organics Analysis (Continued)

RPT Date: Aug 24, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
1,2-Dichloropropane	67509	8565518	<1	<1	NA	< 1	100%	80%	120%				102%	70%	130%
Trichloroethene	67509	8565518	<1	<1	NA	< 1	100%	80%	120%				101%	70%	130%
Bromodichloromethane	67509	8565518	<1	<1	NA	< 1	100%	80%	120%				101%	70%	130%
trans-1,3-Dichloropropene	67509	8565518	<1	<1	NA	< 1	101%	80%	120%				99%	70%	130%
4-Methyl-2-pentanone (MIBK)	67509	8565518	<10	<10	NA	< 10	102%	80%	120%						
cis-1,3-Dichloropropene	67509	8565518	<1	<1	NA	< 1	101%	80%	120%				99%	70%	130%
1,1,2-Trichloroethane	67509	8565518	<1	<1	NA	< 1	101%	80%	120%				100%	70%	130%
Toluene	67509	8565518	<0.5	<0.5	NA	< 0.5	100%	80%	120%				105%	70%	130%
Dibromochloromethane	67509	8565518	<1	<1	NA	< 1	101%	80%	120%				99%	70%	130%
Ethylene Dibromide	67509	8565518	<0.3	<0.3	NA	< 0.3	101%	80%	120%				101%	70%	130%
Tetrachloroethene	67509	8565518	<1	<1	NA	< 1	100%	80%	120%				80%	70%	130%
1,1,1,2-Tetrachloroethane	67509	8565518	<1	<1	NA	< 1	101%	80%	120%				103%	70%	130%
Chlorobenzene	67509	8565518	<1	<1	NA	< 1	100%	80%	120%				96%	70%	130%
Ethylbenzene	67509	8565518	<0.5	<0.5	NA	< 0.5	100%	80%	120%				97%	70%	130%
m&p-Xylene	67509	8565518	<0.5	<0.5	NA	< 0.5	100%	80%	120%				98%	70%	130%
Bromoform	67509	8565518	<1	<1	NA	< 1	103%	80%	120%				92%	70%	130%
Styrene	67509	8565518	<0.5	<0.5	NA	< 0.5	101%	80%	120%				97%	70%	130%
1,1,2,2-Tetrachloroethane	67509	8565518	<1	<1	NA	< 1	102%	80%	120%				88%	70%	130%
o-Xylene	67509	8565518	<0.5	<0.5	NA	< 0.5	101%	80%	120%				99%	70%	130%
1,3-Dichlorobenzene	67509	8565518	<0.5	<0.5	NA	< 0.5	100%	80%	120%				98%	70%	130%
1,4-Dichlorobenzene	67509	8565518	<0.5	<0.5	NA	< 0.5	100%	80%	120%				97%	70%	130%
1,2-Dichlorobenzene	67509	8565518	<0.5	<0.5	NA	< 0.5	100%	80%	120%				96%	70%	130%
1,2,4-Trichlorobenzene	67509	8565518	<1	<1	NA	< 1	100%	80%	120%				97%	70%	130%
Bromofluorobenzene	67509	8565518	99	95	4.1%		113%	70%	130%				111%	70%	130%
Dibromofluoromethane	67509	8565518	89	89	0.0%		101%	70%	130%				101%	70%	130%
Toluene - d8	67509	8565518	107	108	0.9%		103%	70%	130%				113%	70%	130%
VH	67509	8565518	<100	<100	NA	< 100									
VPH	67509	8565518	<100	<100	NA	< 100									

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Certified By:

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Water Analysis

RPT Date: Aug 24, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Public Works Dissolved Metals															
Aluminum Dissolved	8568574		6	6	NA	< 2	108%	90%	110%	104%	90%	110%			
Antimony Dissolved	8568574		<0.2	<0.2	NA	< 0.2	101%	90%	110%	96%	90%	110%			
Arsenic Dissolved	8568574		0.7	0.8	19.8%	< 0.1	98%	90%	110%	96%	90%	110%			
Barium Dissolved	8568574		61.4	60.5	1.4%	< 0.2	91%	90%	110%	92%	90%	110%			
Beryllium Dissolved	8568574		<0.01	<0.01	NA	< 0.01	95%	90%	110%	94%	90%	110%			
Bismuth Dissolved	8568574		<0.05	<0.05	NA	< 0.05				99%	90%	110%			
Boron Dissolved	8568574		17	17	3.5%	< 2	96%	90%	110%	102%	90%	110%			
Cadmium Dissolved	8568574		0.03	0.03	NA	< 0.01	99%	90%	110%	97%	90%	110%			
Calcium Dissolved	8568574		82600	81100	1.9%	< 50	103%	90%	110%	105%	90%	110%			
Chromium Dissolved	8568574		<0.5	<0.5	NA	< 0.5	101%	90%	110%	101%	90%	110%			
Cobalt Dissolved	8568574		0.09	0.09	NA	< 0.05	96%	90%	110%	100%	90%	110%			
Copper Dissolved	8568574		1.2	1.3	7.3%	< 0.2	99%	90%	110%	102%	90%	110%			
Iron Dissolved	8568574		26	25	NA	< 10	99%	90%	110%	104%	90%	110%			
Lead Dissolved	8568574		<0.05	<0.05	NA	< 0.05	102%	90%	110%	100%	90%	110%			
Lithium Dissolved	8568574		7.5	7.6	0.8%	< 0.5				95%	90%	110%			
Magnesium Dissolved	8568574		21100	20800	1.4%	< 50	104%	90%	110%	105%	90%	110%			
Manganese Dissolved	8568574		30	31	0.8%	< 1	103%	90%	110%	105%	90%	110%			
Mercury Dissolved	8568574		<0.01	<0.01	NA	< 0.01				92%	90%	110%			
Molybdenum Dissolved	8568574		4.64	4.80	3.4%	< 0.05	95%	90%	110%	102%	90%	110%			
Nickel Dissolved	8568574		0.8	0.8	NA	< 0.2	99%	90%	110%	103%	90%	110%			
Potassium Dissolved	8568574		5320	5330	0.2%	< 50	95%	90%	110%	103%	90%	110%			
Selenium Dissolved	8568574		3.7	3.6	2.1%	< 0.5	94%	90%	110%	100%	90%	110%			
Silicon Dissolved	8568574		7320	7340	0.3%	< 50				91%	90%	110%			
Silver Dissolved	8568574		<0.02	<0.02	NA	< 0.02				95%	90%	110%			
Sodium Dissolved	8568574		24200	23800	1.8%	< 50	98%	90%	110%	103%	90%	110%			
Strontium Dissolved	8568574		820	818	0.3%	< 0.1	99%	90%	110%	98%	90%	110%			
Sulphur Dissolved	8568574		20800	20700	0.2%	< 500				107%	90%	110%			
Thallium Dissolved	8568574		0.01	<0.01	NA	< 0.01	96%	90%	110%	97%	90%	110%			
Tin Dissolved	8568574		<0.05	<0.05	NA	< 0.05				98%	90%	110%			
Titanium Dissolved	8568574		2.3	2.4	NA	< 0.5				92%	90%	110%			
Uranium Dissolved	8568574		7.54	7.46	1.1%	< 0.01	95%	90%	110%	95%	90%	110%			
Vanadium Dissolved	8568574		0.9	0.9	NA	< 0.5	100%	90%	110%	100%	90%	110%			
Zinc Dissolved	8568574		<2	<2	NA	< 2	96%	90%	110%	103%	90%	110%			
Zirconium Dissolved	8568574		<0.1	<0.1	NA	< 0.1				100%	70%	130%			

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Chloride in Water															
Chloride	8565715		2.51	2.46	2.1%	< 0.05	104%	90%	110%	93%	90%	110%			

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date: Aug 24, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Certified By:

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QA Violation

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

ATTENTION TO: Erin O'Brien

RPT Date: Aug 24, 2017

PARAMETER	Sample Id	Sample Description	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
				Lower	Upper		Lower	Upper		Lower	Upper
(SWEP) Metals											
Boron - Leachate (SWEP)		03796-01	77%	80%	120%	101%	80%	120%	NA	80%	120%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.
With multi element scans it is acceptable for a maximum of 10% (including non-reported elements) of each QC criteria to fail to an absolute maximum of 10%.

Soil Analysis - SWEP Metals											
Boron - Leachate (SWEP)		03796-03	77%	80%	120%	101%	80%	120%	NA	80%	120%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.
With multi element scans it is acceptable for a maximum of 10% (including non-reported elements) of each QC criteria to fail to an absolute maximum of 10%.

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Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA **AGAT WORK ORDER: 17N238668**

PROJECT: 1657709 5000 **ATTENTION TO: Erin O'Brien**

SAMPLING SITE: **SAMPLED BY:**

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Arsenic - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Barium - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Boron - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Cadmium - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Chromium - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Copper - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Lead - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Mercury - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Selenium - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Silver - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Uranium - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Zinc - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Fluoride - Leachate (SWEP)	INST 0425	EPA SW 846-1311 BC SW	IC
Nitrate - Leachate (SWEP)	INST 0425	EPA SW 846-1311 BC SW	IC
Nitrite - Leachate (SWEP)	INST 0425	EPA SW 846-1311 BC SW	IC
Cyanide - Leachate (SWEP)	SOIL 0420; INST 0310	BC Laboratory Manual 2013	CONTINUOUS FLOW ANALYZER
Aluminum	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Antimony	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Arsenic	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Barium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Beryllium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Bismuth	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Cadmium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Calcium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Chromium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Cobalt	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Copper	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Iron	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Lead	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Lithium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Magnesium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Manganese	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP-MS
Mercury	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Molybdenum	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS

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Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Nickel	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Phosphorus	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Potassium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Selenium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Silver	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Sodium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Strontium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP-MS
Thallium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Tin	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Titanium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Uranium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Vanadium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Zinc	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Zirconium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
pH 1:2	INOR-181-6031	BC MOE Lab Manual B (pH, Electrometric, Soil)	PH METER
Chloride, Soluble	LAB-181-4022, INOR-181-6023	BC MOE Lab Manual Section B	COLORIMETER
Sodium, Soluble	LAB-181-4022, MET-181-6106	BC MOE Lab Manual Section B	ICP/OES
Saturation Percentage	LAB-181-4022	BC MOE Lab Manual Section B	GRAVIMETRIC

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Naphthalene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
2-Methylnaphthalene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
1-Methylnaphthalene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthylene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluorene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Phenanthrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Chrysene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(b)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(j)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(k)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Indeno(1,2,3-c,d)pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Dibenzo(a,h)anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(g,h,i)perylene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Quinoline	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
IACR CCME (Soil)	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
B[a]P TPE (Soil)	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
EPH C10-C19	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
EPH C19-C32	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
LEPH C10-C19	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
HEPH C19-C32	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
Naphthalene - d8	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS

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Method Summary

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PROJECT: 1657709 5000 **ATTENTION TO: Erin O'Brien**

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
2-Fluorobiphenyl	ORG-180-5102	Modified form BCMOE Lab Manual Section D (PAH)	GC/MS
P-Terphenyl - d14	ORG-180-5102	Modified form BCMOE Lab Manual Section D (PAH)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Benzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Toluene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Ethylbenzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
m&p-Xylene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
o-Xylene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Styrene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
VPH	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
VH	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Bromofluorobenzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Dibromofluoromethane	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Toluene - d8	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
Benzene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
Toluene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
Ethylbenzene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
m&p-Xylene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
o-Xylene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
Styrene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
VPH	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
VH	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
Bromofluorobenzene	ORG-180-5130	modified from BC MOE Lab Manual Section D	GC/MS
Dibromofluoromethane	ORG-180-5130	modified from BC MOE Lab Manual Section D	GC/MS
Toluene - d8	ORG-180-5130	modified from BC MOE Lab Manual Section D	GC/MS
op'-DDT	ORG-91-5113	EPA SW - 846 3541/8081	GC/ECD
pp'- DDT	ORG-91-5113	EPA SW - 846 3541/8081	GC/ECD
DDT (Total)	ORG-91-5113	EPA SW - 846 3541/8081	GC/ECD
Moisture Content		MOE E3139	BALANCE

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
TCMX	ORG-91-5112	EPA SW-846 3541 & 8081	GC/ECD
Decachlorobiphenyl	ORG-91-5113	EPA SW - 846 3541/8081	GC/ECD
Propylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Monoethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Diethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Triethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Tetraethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Heptanol	TO-1410	EPA SW-846 8015	GC/FID
Quinoline	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthylene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluorene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Phenanthrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Anthracene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acridine	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Pyrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)anthracene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Chrysene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(b)fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(j)fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(k)fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)pyrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Indeno(1,2,3-c,d)pyrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Dibenzo(a,h)anthracene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(g,h,i)perylene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
1-Methylnaphthalene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
2-Methylnaphthalene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
EPH C10-C19	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
EPH C19-C32	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
LEPH C10-C19	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID

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PROJECT: 1657709 5000 **ATTENTION TO: Erin O'Brien**

SAMPLING SITE: **SAMPLED BY:**

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
HEPH C19-C32	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
Naphthalene - d8			GC/MS
2-Fluorobiphenyl	ORG-180-5133	Modified form BCMOE Lab Manual Section D (PAH)	GC/MS
P-Terphenyl - d14	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Chloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Vinyl Chloride	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromomethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichlorofluoromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Acetone	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dichloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
2-Butanone (MEK)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,2-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,2-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroform	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1-Trichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Carbon Tetrachloride	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Benzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloropropane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromodichloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,3-Dichloropropene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
4-Methyl-2-pentanone (MIBK)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,3-Dichloropropene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
1,1,2-Trichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromochloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylene Dibromide	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Tetrachloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1,2-Tetrachloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylbenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
m&p-Xylene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromoform	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Styrene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2,2-Tetrachloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
o-Xylene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,3-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,4-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2,4-Trichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromofluorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromofluoromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene - d8	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
VH	ORG-180-5103	Modified from BC MOE Lab Manual Sec D (VOC)	GC/MS/FID
VPH	ORG-180-5103	Modified from BC MOE Lab Manual Sec D (VOC)	GC/MS/FID
Chloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Vinyl Chloride	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromomethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichlorofluoromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Acetone	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA **AGAT WORK ORDER: 17N238668**

PROJECT: 1657709 5000 **ATTENTION TO: Erin O'Brien**

SAMPLING SITE: **SAMPLED BY:**

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
1,1-Dichloroethene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dichloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
2-Butanone (MEK)	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,2-Dichloroethylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,2-Dichloroethylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroform	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1-Trichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Carbon Tetrachloride	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Benzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloropropane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichloroethene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromodichloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,3-Dichloropropene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
4-Methyl-2-pentanone (MIBK)	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,3-Dichloropropene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2-Trichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromochloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylene Dibromide	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Tetrachloroethene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1,2-Tetrachloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
Chlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylbenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
m&p-Xylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromoform	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
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http://www.agatlabs.com

Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Styrene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2,2-Tetrachloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
o-Xylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,3-Dichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,4-Dichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2,4-Trichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromofluorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromofluoromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene - d8	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
VH	ORG-180-5133	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS/FID
VPH	ORG-180-5131	Modified from BC MOE Lab Manual Sec D (VOC)	GC/MS/FID

AGAT Laboratories
Unit 120, 8600 Glenlyon Parkway
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Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA **AGAT WORK ORDER: 17N238668**

PROJECT: 1657709 5000 **ATTENTION TO: Erin O'Brien**

SAMPLING SITE: **SAMPLED BY:**

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Chloride	INOR-181-6002	Modified from SM 4110 B	ION CHROMATOGRAPH
Aluminum Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Antimony Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Arsenic Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Barium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Beryllium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Bismuth Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Boron Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Cadmium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Calcium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Chromium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Cobalt Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Copper Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Iron Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Lead Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Lithium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Magnesium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Manganese Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Mercury Dissolved	MET-181-6103, LAB-181-4015	Modified from EPA 245.7	CV/AA
Molybdenum Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Nickel Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Potassium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Selenium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Silicon Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Silver Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Sodium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Strontium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Sulphur Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
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Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N238668

PROJECT: 1657709 5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Thallium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Tin Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Titanium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Uranium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Vanadium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Zinc Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Zirconium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS

WO: 17N238668

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03809 page 1 of 3

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709/5000		Laboratory Name: AGAT	
Short Title: K19 Field Investigation	Golder Contact: Erin O'Brien	Address: 120-9600 Glenlyon Parkway, Burnaby BC	
Golder E-mail Address 1: erin_o'brien@golder.com	Golder E-mail Address 2: linda_kemp@golder.com	Telephone/Fax: (778) 452-4000	Contact: Maggie Crain

Office Name: Vancouver, BC (VIRTUAL WAY) EQuIS Facility Code: 284 33859 EQuIS upload: ☐

Jul 18 AM 10:38

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☑ Regular (5 Days)
Criteria: ☑ CSR ☑ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail Quote No.:

Analyses Required

Lab ID	Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D/M/Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	D&S Metals/Hg	VPH/BTEX	LEPH/PAH	VOC	Chloride	Glycol			RUSH (Select TAT above)	Remarks (over)
8565518	03809 - 01	K19-MW16-14			WG	15/07/17	9:20					X	X	X	X	X					
536	03809 - 02	K19-MW17-01D			WG	15/07/17	11:15					X	X	X	X		X				
586	03809 - 03	K19-MW16-01D			WG	15/07/17	14:00					X	X	X	X	X					
623	03809 - 04	K19-[illegible]	02		WG	15/07/17	15:45					X	X	X							
	- 05																				
	- 06																				
	- 07																				
	- 08																				
	- 09																				
	- 10																				
	- 11																				
	- 12																				

OK 18/7 17 July 2017

Sampler's Signature: Anne Wozney	Relinquished by: Signature: Anne Wozney	Company: Golder Assoc.	Date: July 16/17	Time: 5:00pm	Received by: Signature	Company	
Comments:	Method of Shipment	Waybill No.	Received for Lab by:		Date	Time	
	Shipped by	Shipment Condition: Seal Intact:	Temp (°C): 3	Cooler opened by:	Date	Time	

WHITE: Golder Copy YELLOW: Lab Copy

V110160

WO: 1711238668

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03808 page 2 of 7

Golder Associates

200 – 2920 Virtual Way
Vancouver British Columbia Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709 / 5000			Laboratory Name: AGAT
Short Title: K19 Field Investigation	Golder Contact: Erin O'brien		Address: 120-6000 Glenlyon Parkway, Burnaby, BC
Golder E-mail Address 1: erin_obrien @golder.com	Golder E-mail Address 2: linda_lemp @golder.com		Telephone/Fax: (778) 452-4000
			Contact: Maggie Chan

Office Name: Vancouver - Virtual Way

EQuIS Facility Code: 28433859
EQuIS upload: ☐

Jul 18 am 10:38

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Regular (5 Days)
Criteria: ☐ CSR ☐ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Analyses Required

Lab ID:	Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Dissolved metals/Hg	VPH/BTEX	LEPH/HEPH/PAH	Chloride	Glycol	VOC					RUSH (Select TAT above)	Remarks (over)
8565629	03808 - 01	K19-MW16-10D			WG	13/07/17	9:25					X	X	X	X	X							
632	03808 - 02	K19-MW16-10S			WG	13/07/17	11:00					X	X	X	X	X							
682	03808 - 03	K19-MW16-12D			WG	13/07/17	13:05					X	X	X	X	X							
715	03808 - 04	K19-MW16-12S			WG	13/07/17	14:30					X	X	X	X	X							
752	03808 - 05	K19-MW16-03D			WG	14/07/17	13:45					X	X	X	X		⊗	del					
760	03808 - 06	K19A-10MW03			WG	14/07/17	15:11					X	X	X	X		X						
	- 07																						
	- 08																						
	- 09																						
	- 10																						
	- 11																						
	- 12																						

Remarks: Chlorides required by July 21, 2017 8am

Sampler's Signature: Aurélie Wy	Relinquished by Signature: Aurélie Wy	Company: Golder Associates	Date: July 16/17	Time: 5:00pm	Received by Signature	Company	
Comments: Invoice Dave Osguthorpe	Method of Shipment:	Waybill No:	Received for Lab by: JCW		Date	Time	
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C): 3	Cooler opened by:	Date	Time	

WHITE: Golder Copy YELLOW: Lab Copy

V110159

WO: 17N238668

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03796 page 3 of 17

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709 / 5000		Laboratory Name: AGAT	
Short Title: K19 Field Inv.	Golder Contact: Erin O'Brien	Address: 120 - 8600 Glenlyon Pkwy, Burnaby BC	
Golder E-mail Address 1: erin_o'brien @golder.com	Golder E-mail Address 2: linda_kemp @golder.com	Telephone/Fax: (778) 452-4000	Contact: Maggie Chan

Office Name: Vancouver - Virtual Way

EQuIS Facility Code: 28433859

EQuIS upload: ☑

Jul 18 AM 10:38

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☑ Regular (5 Days)

Criteria: ☑ CSR ☑ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

lab ID:

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Analyses Required: Metals / LEPH/HEPH / BTEX/VPH / VOCs / Nat'l Sat Pesticides / PPT / Toluene only	RUSH (Select TAT above)	Remarks (over)
8565765 03796-01	K19-TP17-51	1	0.7	SO	14/07/17	09:10	Discrete			3	/ / / / / / X		
766 -02		2	1.7			09:20				1			
771 -03		3	2.8			09:30				1			
774 -04		4	3.9			09:40				3			
779 -05		5	4.9			09:50				3	X		
794 -06	K19-TP17-52	1	0.8			10:35		FDA	03796-07	3	X X X X		
799 -07		1	0.8			10:35		FD	03796-06	3	X X X X		
801 -08		2	1.8 ~~1.8~~			10:45				1			
802 -09		3	2.7 ~~2.7~~			10:55				1	X X		
804 -10		4	4.0			11:05				3			
805 -11	K19-TP17-53	1	0.8			12:10				1	X X		
806 -12		2	1.9			12:20				3	1, X X		

Sampler's Signature	Relinquished by: Signature	Company: Golder	Date: 10-JUL-17	Time: 5 PM	Received by: Signature	Company
Comments: Invoice Dave Osgutmorpe	Method of Shipment:	Waybill No	Received for Lab by: JC	Date		Time
	Shipped by:	Shipment Condition / Seal Intact:	Temp (°C): 3	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy

V110158

WO: 17N238668

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03820 page 4 of 67

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709 / 5000
Short Title: K19 Field Inv.
Golder Contact: Erin O'Brien
Golder E-mail Address 1: [redacted]@golder.com
Golder E-mail Address 2: [redacted]@golder.com
Laboratory Name: AGAT
Address: 120-6600 Glenlyon Pkway, Burnaby BC
Telephone/Fax: (778) 452-4000
Contact: Maggie Chan

erin_o'brien linda_kemp

Office Name: Vancouver - Virtual Way
EQuIS Facility Code: 28433859
EQuIS upload: ☑

Jul 18 Am 10:36

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☑ Regular (5 Days)
Criteria: ☑ CSR ☑ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail
Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Metals	LEPH/HEPH/PAH	BTEX / VPH	VOC	Na + Cl Soil pastes	DPT	RUSH (Select TAT above)	Remarks (over)
03820-01	K19-TP17-53	3	3.0	SO	14/07/17	12:30	Discrete			1								
-02	↓	4	4.0			12:40				3								
-03	K19-TP17-54	1	0.7			13 25		FD	03820-04	3	X	X	X					
-04		1	0.7			13 25		FD	03820-03	3								
-05		2	1.6			13 35				1		X	X					
-06		3	3.0			13 45				3								
-07	↓	4	4.1			13 55				3		X	X					
-08	K19 TP17 55	1	0.5			15 20				3	X		X					
-09		2	1.8			15 30				1		X						
-10		3	3.0			15 40				3				X				
-11	↓	4	4.0			15 50				3		X	X					
-12																		

lab ID:
8565807
808
809
810
811
812
813
814
815
816
817

Sampler's Signature	Relinquished by Signature	Company	Date	Time	Received by Signature	Company
		Golder	16-JUL-17	5PM		

Comments	Method of Shipment	Waybill No	Received for Lab by:	Date	Time
Invoice Dave Osguthorpe			SC		
	Shipped by	Shipment Condition / Seal Intact:	Temp (°C): 3	Cooler opened by:	Date / Time

WHITE: Golder Copy YELLOW: Lab Copy

V110157

WO: 17N238668

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03821 page 5 of 37

Golder Associates
200 - 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709 / 5000			Laboratory Name: AGAT
Short Title: K19 Field Inv.	Golder Contact: Erin O'Brien		Address: 120-8600 Glenlyon Pkwy, Burnaby BC
Golder E-mail Address 1: erin_o'brien @golder.com	Golder E-mail Address 2: linda_kemp @golder.com		Telephone/Fax: (778) 452-4000
			Contact: Maggie Chan

Office Name: Vancouver - Virtual Way

EQuIS Facility Code: 28433859

EQuIS upload: ☑

Jul 18 am 10:38

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☑ Regular (5 Days)

Criteria: ☑ CSR ☑ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Metals	LEAH/HEAH/PAH	BTEX / VPH	VOC	Na-TIC (Soil)	DDT	RUSH (Select TAT above)	Remarks (over)
lab ID: 8565819																		
03821-01	K19-TP17-56	1	0.6	SO	15/07/17	0905	Discrete			3	X							
820 -02		2	1.5			0915				1		X						
821 -03		3	2.5			0925				3			X					
822 -04		4	4.0			0935				3		X	X	X				
823 -05	K19-TP17-57	1	0.6			1015		FDA	03821-06	3	X	X	X	X				
824 -06		1	0.6			1025		FD	03821-05	3			X	X		X		
825 -07		2	1.6			1035				1								
826 -08		3	2.5			1045				3								
827 -09		4	4.0			1055				3		X	X					
828 -10	K19-TP17-58	1	0.5			1310				3	X							
829 -11		2	1.6			1320				1								
830 -12		3	2.5			1330				3		X	X					

Sampler's Signature:	Relinquished by: Signature	Company: Golder	Date: 16-JUL-17	Time: 5 PM	Received by: Signature / Company
Comments: Invoice Dave Osgathorpe	Method of Shipment	Waybill No	Received for Lab by	Date	Time
	Shipped by	Shipment Condition / Seal Intact:	Temp (°C): 9	Cooler opened by:	Date / Time

WHITE: Golder Copy YELLOW: Lab Copy

V110156

WO: 17N238688

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03822 page 6 of 7

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709 / 5000		Laboratory Name: AGAT	
Short Title: KIA Field Inv.	Golder Contact: Erin O Brien	Address: 120-8600 Glenlyon Pkwy, Burnaby BC	
Golder E-mail Address 1: erin_o brien @golder.com	Golder E-mail Address 2: linda_kemp @golder.com	Telephone/Fax: (778) 452-4000	Contact: Maggie Chan

Office Name: Vancouver – Virtual Way

EQuIS Facility Code: 28433859

EQuIS upload: ☑

Jul 18 Am 10:38

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☑ Regular (5 Days)

Criteria: ☐ CSR ☑ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Analyses Required

Lab ID	Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Metals	LEH/HEAP/PAH	BTEX/VPH	VOC	Na + Cl	RUSH (Select TAT above)	Remarks (over)
8565831	03822-01	KIA-TP17-58	4	4.0	SO	15/07/17	1340	Discrete			3		X	X	X			
832	-02	KIA-TP17-59	1	0.5			1500		FDA	03822-03	3	X						
833	-03		1	0.5			1500		FD	03822-02	3				X			
834	-04		2	1.4			1510				1							
835	-05		3	2.6			1520				3		X	X	X			
837	-06		4	4.0			1530				3							
838	-07	KIA-TP17-60	1	0.6		16/07/17	0925				6	X			X			
840	-08		2	1.5			0935				4							
850	-09		3	2.6			0945				4							
862	-10		4	3.7			0955				6		X	X	X			
877	-11		5	4.2			1005				6		X					
900	-12	KIA-TP17-61	1	0.6			1120				6	X		X	X			

Sampler's Signature:	Relinquished by Signature	Company: Golder	Date: 16-JUL-17	Time: 5PM	Received by Signature	Company
Comments: Invoice Dave Osguthorpe	Method of Shipment	Waybill No	Received for Lab by: JC	Date		Time
	Shipped by	Shipment Condition / Seal Intact:	Temp (°C): 3	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy

V110155

17N238668

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03776 page 1 of 1

Golder Associates

200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709-5000			Laboratory Name: AGAT
Short Title: Kig Field Investigation	Golder Contact: Erin O'brien		Address: 120 - 8600 Glenlyon Parkway Burnaby
Golder E-mail Address 1: erin_obrien @golder.com	Golder E-mail Address 2: linda_kemp @golder.com		Telephone/Fax: (778) 452-4000
			Contact: Maggie Chan

Office Name: Vancouver Virtual Way

EQuIS Facility Code: 28433859
EQuIS upload: ☒

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Regular (5 Days)
Criteria: ☒ CSR ☒ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Analyses Required

L-b IDs	Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Metals	LEH/HEPH/PAH	BTEX/VPH	VOC	Natural Soil pH/CE	RUSH (Select TAT above)	Remarks (over)
856902	03776 - 01	KH-HD17-01		0.40	SO	16/07/17	9:00				5	X	X			X		
909	03776 - 02	KH-HD17-02		0.40	SO	16/07/17	11:20				5	X	X	X	X			
911	03776 - 03	KH-HD17-03		0.35	SO	16/07/17	13:00				5	X	X	X	X			
912	03776 - 04	KH-HD17-04		0.41	SO	16/07/17	13:05				5	X	X			X	X	
913	03776 - 05	KH-HD17-05		0.4	SO	16/07/17	15:40				5	X						
914	03776 - 06	KH-HD17-06		0.4	SO	16/07/17	16:00				5	X						
915	03776 - 07	KH-HD17-07		0.28	SO	16/07/17	16:32				5	X		X		X		
	- 08																	
	- 09																	
	- 10																	
	- 11																	
	- 12																	

Remarks: Updated July 17 2017

Sampler's Signature: Adelle	Relinquished by: Signature: Adelle Chang	Company: GOLDER	Date: July 16/17	Time: 17:00	Received by: Signature	Company	
Comments	Method of Shipment:	Waybill No:	Received for Lab by: Maggie		Date	Time	
	Shipped by:	Shipment Condition / Seal intact:	Temp (°C): 3	Cooler opened by:	Date	Time	

WHITE: Golder Copy YELLOW: Lab Copy

V110154

ESED

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM

RECEIVING BASICS - Shipping

Company/Consultant: CMA

Courier: _____ (Prepaid) Collect

Waybill#_____

Branch: EDM GP (FN) FM RD VAN LYD FSJ EST Other:_____

Custody Seal Intact: Yes (No) NA

TAT: <24hr 24-48hr 48-72hr Reg Other_____

Cooler Quantity: _____

TIME SENSITIVE ISSUES - Shipping

ALREADY EXCEEDED HOLD TIME? Yes (No)

Inorganic Tests (Please Circle): Mibi , BOD , Nitrate/Nitrite , Turbidity , Microtox , Ortho PO4 , Tedlar Bag , Residual Chlorine , Chlorophyll* , Chloroamines*

Earliest Expiry:_____

Hydrocarbons: Earliest Expiry _____

SAMPLE INTEGRITY - Shipping

Hazardous Samples: YES (NO) Precaution Taken:_____

Legal Samples: Yes (No)

International Samples: Yes (No)

Tape Sealed: Yes (No)

Coolant Used: Icepack (Bagged Ice) Free Ice Free Water None

Temperature (Bottles/Jars only) N/A if only Soil Bags Received

FROZEN (Please Circle if samples received Frozen)

1 (Bottle/Jar) 1 + 3 + 4 = 3 °C	2(Bottle/Jar) 4 + 2 + 5 = 4 °C
3 (Bottle/Jar) 2 + 5 + 5 = 4 °C	4 (Bottle/Jar)___+___+___=___ °C
5 (Bottle/Jar) 1 + 0 + 4 = 2 °C	6 (Bottle/Jar)___+___+___=___ °C
7 (Bottle/Jar)___+___+___=___ °C	8 (Bottle/Jar)___+___+___=___ °C
9 (Bottle/Jar)___+___+___=___ °C	10 (Bottle/Jar)___+___+___=___ °C

(If more than 10 coolers are received use another sheet of paper and attach)

LOGISTICS USE ONLY

Workorder No: _____

Samples Damaged: Yes (No) If YES why?

No Bubble Wrap Frozen Courier

Other: _____

Account Project Manager: _____ have they been notified of the above issues: Yes No

Whom spoken to: _____ Date/Time: _____

CPM Initial_____

General Comments: _____

* Subcontracted Analysis (See CPM)

Date issued: May 22, 2015
Document ID: SR-9505.002

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM - BURNABY

Work Order # 17N238668

RECEIVING BASICS:

Received From: Novex Waybill #: _____

SAMPLE QUANTITIES:

Coolers: 4 Containers: 277

TIME SENSITIVE ISSUES:

Earliest Date Sampled: July 14, 2017 ALREADY EXCEEDED? Yes (No)

NON-CONFORMANCES:

3 temperatures of samples* and average of each cooler: (record differing temperatures on the CoC next to sample ID's) ***use jars when available**

(1) 0 + 2 + 1 = 1 °C (2) 3 + 4 + 1 = 3 °C (3) 4 + 4 + 4 = 4 °C (4) 3 + 3 + 3 = 3 °C

Was ice or ice pack present: (Yes) No

Integrity Issues:

Account Project Manager: _____ have they been notified of the above issues: Yes No

Whom spoken to: _____ Date and Time: _____

ADDITIONAL NOTES:

03823-02 received but not listed on COC.

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM

RECEIVING BASICS - Shipping

Company/Consultant: Public Works

Courier: purolator Prepaid Collect

Waybill# 331111 2997066

Branch: EDM GP FN FM RD (VAN) LYD FSJ EST Other:_____

If multiple sites were submitted at once: (Yes) No

Custody Seal Intact: Yes No (NA)

TAT: <24hr 24-48hr 48-72hr (Reg) Other_____

Cooler Quantity: 1

TIME SENSITIVE ISSUES - Shipping

ALREADY EXCEEDED HOLD TIME? Yes No

Inorganic Tests (Please Circle): Mibi , BOD , Nitrate/Nitrite , Turbidity , Microtox , Ortho PO4 , Tedlar Bag , Residual Chlorine , Chlorophyll* , Chloroamines*

Earliest Expiry:_____

Hydrocarbons: Earliest Expiry _____

SAMPLE INTEGRITY - Shipping

Hazardous Samples: YES (NO) Precaution Taken:_____

Legal Samples: Yes (No)

International Samples: Yes (No)

Tape Sealed: Yes No

Coolant Used: Icepack Bagged Ice Free Ice Free Water None

Temperature (Bottles/Jars only) N/A if only Soil Bags Received

FROZEN (Please Circle if samples received Frozen)

1 (Bottle/Jar) 8 + 8 + 8 = 8 °C 2(Bottle/Jar)___+___+___=____°C

3 (Bottle/Jar)___+___+___=____°C 4 (Bottle/Jar)___+___+___=____°C

5 (Bottle/Jar)___+___+___=____°C 6 (Bottle/Jar)___+___+___=____°C

7 (Bottle/Jar)___+___+___=____°C 8 (Bottle/Jar)___+___+___=____°C

9 (Bottle/Jar)___+___+___=____°C 10 (Bottle/Jar)___+___+___=____°C

(If more than 10 coolers are received use another sheet of paper and attach)

LOGISTICS USE ONLY

Workorder No: 17N238668

Samples Damaged: Yes No If YES why?

No Bubble Wrap Frozen Courier

Other: _____

Account Project Manager: _____have they been notified of the above issues: Yes No

Whom spoken to: _____ Date/Time: _____

CPM Initial_____

General Comments: _____

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
219-800 BURRARD ST
VANCOUVER, BC V6Z 0B9
604-671-1831

ATTENTION TO: Erin O'Brien

PROJECT: 1657709.5000

AGAT WORK ORDER: 17N240971

SOIL ANALYSIS REVIEWED BY: Jennifer Liu, Analyst, Qualified Person

TRACE ORGANICS REVIEWED BY: Andrew Garrard, B.Sc., General Manager

WATER ANALYSIS REVIEWED BY: Andrew Garrard, B.Sc., General Manager

DATE REPORTED: Aug 24, 2017

PAGES (INCLUDING COVER): 90

VERSION*: 4

Should you require any information regarding this analysis please contact your client services representative at (778) 452-4000

*NOTES

VERSION 4: Sample receipt temperature 3°C.

Version 4 issued on September 22, 2017 to report additional SWEP metals as requested by Erin O'Brien of Golder. Version 4 is an amendment to all previous versions.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

(SWEP) Metals

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03826-04	03826-06
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2017-07-18	2017-07-18
Parameter	Unit	G / S	RDL	8582779	8582782
Arsenic - Leachate (SWEP)	mg/L	2.5	0.5	<0.5	<0.5
Barium - Leachate (SWEP)	mg/L	100	0.5	<0.5	<0.5
Boron - Leachate (SWEP)	mg/L	500	0.5	<0.5	<0.5
Cadmium - Leachate (SWEP)	mg/L	0.5	0.5	<0.5	<0.5
Chromium - Leachate (SWEP)	mg/L	5	0.5	<0.5	<0.5
Copper - Leachate (SWEP)	mg/L	100	0.5	<0.5	<0.5
Lead - Leachate (SWEP)	mg/L	5	0.5	<0.5	<0.5
Mercury - Leachate (SWEP)	mg/L	0.1	0.1	<0.1	<0.1
Selenium - Leachate (SWEP)	mg/L	1	0.5	<0.5	<0.5
Silver - Leachate (SWEP)	mg/L	5	0.5	<0.5	<0.5
Uranium - Leachate (SWEP)	mg/L	10	0.5	<0.5	<0.5
Zinc - Leachate (SWEP)	mg/L	500	0.5	<0.5	<0.5

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to NORTHERN ROCKIES
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8582779-8582782 Analysis based on 'as received'.

Certified By:

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Metals in Soil

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

SAMPLE DESCRIPTION:				03823-11	03824-03	03824-08	03824-09	03824-12	03825-05	03825-09	03827-06
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2017-07-16	2017-07-17	2017-07-17	2017-07-17	2017-07-17	2017-07-17	2017-07-18	2017-07-19
Parameter	Unit	G / S	RDL	8582701	8582708	8582723	8582729	8582746	8582766	8582770	8582820
Aluminum	µg/g		10	12300	14000	10200	9980	12700	10500	12500	9930
Antimony	µg/g		0.1	0.4	0.4	0.3	0.2	0.3	0.4	0.5	0.5
Arsenic	µg/g		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	9.4	7.1	7.0
Barium	µg/g		0.5	189	193	304	205	323	547	388	252
Beryllium	µg/g		0.1	0.6	0.5	0.5	0.3	0.6	0.6	0.7	0.6
Bismuth	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	µg/g		0.01	0.11	0.10	0.18	0.11	0.11	0.14	0.12	0.19
Calcium	µg/g		10	684	1660	2030	2010	2110	2890	4000	2580
Chromium	µg/g		1	<1	<1	<1	<1	<1	17	18	16
Cobalt	µg/g		0.1	<0.1	<0.1	0.1	<0.1	<0.1	7.6	7.7	10.2
Copper	µg/g		0.2	<0.2	<0.2	<0.2	<0.2	<0.2	23.2	19.6	18.6
Iron	µg/g		10	26500	25300	35700	39200	26000	26000	25900	18900
Lead	µg/g		0.1	11.2	8.2	8.3	5.1	10.6	13.0	10.8	9.6
Lithium	µg/g		0.5	8.5	9.1	6.7	4.2	12.4	15.4	11.5	9.5
Magnesium	µg/g		10	2430	3330	2420	2370	3010	2520	2850	2420
Manganese	µg/g		1	281	120	621	395	224	142	291	257
Mercury	µg/g		0.01	0.03	0.03	0.02	0.02	0.05	0.04	0.04	0.04
Molybdenum	µg/g		0.2	1.2	0.9	0.6	0.4	1.0	1.0	1.3	1.2
Nickel	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	22.3	18.5	25.3
Phosphorus	µg/g		5	506	430	629	657	460	936	1570	682
Potassium	µg/g		5	1650	1840	1890	1910	2040	1850	1820	1520
Selenium	µg/g		0.1	0.9	0.6	0.8	0.5	0.8	0.9	0.9	0.5
Silver	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sodium	µg/g		5	89	84	61	62	101	126	182	77
Strontium	µg/g		1	24	16	14	9	30	52	35	24
Thallium	µg/g		0.1	0.1	0.1	0.1	<0.1	<0.1	0.1	0.2	0.2
Tin	µg/g		0.2	0.4	0.4	0.3	0.2	0.5	0.5	0.4	0.4
Titanium	µg/g		1	92	114	59	57	70	80	115	96
Uranium	µg/g		0.2	1.3	0.7	0.9	0.6	1.6	1.1	0.9	0.9
Vanadium	µg/g		1	<1	<1	<1	<1	<1	28	35	31

Certified By:

AGAT Laboratories
Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Metals in Soil

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03823-11	03824-03	03824-08	03824-09	03824-12	03825-05	03825-09	03827-06
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-16	2017-07-17	2017-07-17	2017-07-17	2017-07-17	2017-07-17	2017-07-18	2017-07-19
Parameter	Unit	G / S	RDL	8582701	8582708	8582723	8582729	8582746	8582766	8582770	8582820
Zinc	µg/g		1	<1	<1	<1	<1	<1	88	76	78
Zirconium	µg/g		0.1	1.8	1.7	1.4	0.9	1.8	2.1	2.0	2.9
pH 1:2	pH units		0.05	4.88	5.16	5.54	5.63	5.48	5.32	5.28	5.72

Certified By:

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Metals in Soil

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

SAMPLE DESCRIPTION:				03827-10	03827-11	03811-01	03813-01	03813-02	03813-03	03813-04	03813-05
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2017-07-19	2017-07-19	2017-07-17	2017-07-18	2017-07-18	2017-07-18	2017-07-18	2017-07-18
Parameter	Unit	G / S	RDL	8582832	8582833	8582868	8582885	8582888	8582890	8582891	8582893
Aluminum	µg/g		10	12900	11900	4990	11100	12600	12500	15100	18300
Antimony	µg/g		0.1	0.6	0.7	0.4	0.7	0.5	0.8	0.6	0.4
Arsenic	µg/g		0.1	7.9	9.5	4.8	6.9	8.4	10.9	9.7	4.7
Barium	µg/g		0.5	463	365	257	246	326	527	377	640
Beryllium	µg/g		0.1	0.7	0.5	0.4	0.5	0.5	0.8	0.8	1.0
Bismuth	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	µg/g		0.01	0.28	0.13	0.40	0.47	0.36	0.53	0.64	0.65
Calcium	µg/g		10	3930	3530	14400	11500	11400	8640	4420	10900
Chromium	µg/g		1	19	14	12	15	15	23	23	25
Cobalt	µg/g		0.1	9.5	4.3	4.5	6.1	6.6	9.9	6.7	5.7
Copper	µg/g		0.2	24.6	24.0	12.9	17.7	16.8	28.6	22.3	21.1
Iron	µg/g		10	30800	14300	20100	26300	31500	32800	27100	20100
Lead	µg/g		0.1	12.2	12.4	6.8	12.4	11.6	15.2	16.2	11.5
Lithium	µg/g		0.5	12.5	8.3	7.0	10.5	10.5	15.2	16.2	13.3
Magnesium	µg/g		10	3430	2700	5380	4340	5330	3440	3430	3100
Manganese	µg/g		1	274	64	176	189	201	264	150	70
Mercury	µg/g		0.01	0.05	0.04	0.03	0.03	0.04	0.05	0.05	0.10
Molybdenum	µg/g		0.2	1.5	1.1	1.1	1.3	1.6	1.8	1.8	1.3
Nickel	µg/g		0.5	30.8	11.8	18.1	20.4	19.4	33.2	24.6	28.4
Phosphorus	µg/g		5	852	542	726	957	998	1180	770	1480
Potassium	µg/g		5	2080	1540	902	2190	2300	2450	2040	1640
Selenium	µg/g		0.1	0.5	0.7	0.5	0.7	0.7	1.2	1.3	2.2
Silver	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sodium	µg/g		5	161	63	70	89	88	113	75	59
Strontium	µg/g		1	34	37	25	28	28	48	31	50
Thallium	µg/g		0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2
Tin	µg/g		0.2	0.5	0.4	0.3	0.5	0.6	0.6	0.6	0.5
Titanium	µg/g		1	86	82	61	92	78	78	100	55
Uranium	µg/g		0.2	0.9	1.0	0.6	0.7	0.8	1.3	2.0	5.1
Vanadium	µg/g		1	34	27	34	32	29	45	48	51

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ATTENTION TO: Erin O'Brien

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DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03827-10	03827-11	03811-01	03813-01	03813-02	03813-03	03813-04	03813-05
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-19	2017-07-19	2017-07-17	2017-07-18	2017-07-18	2017-07-18	2017-07-18	2017-07-18
Parameter	Unit	G / S	RDL	8582832	8582833	8582868	8582885	8582888	8582890	8582891	8582893
Zinc	µg/g		1	98	62	57	89	71	152	80	40
Zirconium	µg/g		0.1	2.8	2.4	1.0	1.9	2.1	4.0	1.0	1.8
pH 1:2	pH units		0.05	6.38	6.84	7.92	7.22	7.68	7.58	5.51	5.28

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		SAMPLE DESCRIPTION:		03813-06	03813-07	03813-08	03813-09	03831-07	03831-08	03832-05
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-18	2017-07-18	2017-07-18	2017-07-18	2017-07-19	2017-07-19	2017-07-19
Parameter	Unit	G / S	RDL	8582896	8582899	8582902	8582903	8582995	8582996	8583007
Aluminum	µg/g		10	21300	7400	15200	14200	12300	13100	7150
Antimony	µg/g		0.1	0.5	0.5	0.6	0.5	0.6	0.6	0.4
Arsenic	µg/g		0.1	6.3	4.9	8.4	8.2	9.4	10.5	6.1
Barium	µg/g		0.5	591	423	341	302	203	199	307
Beryllium	µg/g		0.1	1.0	0.6	0.8	0.7	0.6	0.7	0.5
Bismuth	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	µg/g		0.01	0.72	0.69	0.22	0.20	1.06	0.69	0.12
Calcium	µg/g		10	11600	2420	3750	2760	1640	1440	1610
Chromium	µg/g		1	24	19	24	23	25	27	13
Cobalt	µg/g		0.1	8.3	5.5	9.8	6.5	9.1	9.0	5.2
Copper	µg/g		0.2	20.5	20.4	25.0	19.4	18.3	19.7	14.2
Iron	µg/g		10	26200	25800	28700	25200	22300	23300	18900
Lead	µg/g		0.1	10.1	13.0	12.1	12.3	20.0	19.2	7.7
Lithium	µg/g		0.5	14.7	13.9	15.6	15.5	16.5	17.8	8.1
Magnesium	µg/g		10	4030	1930	4160	3530	2800	2920	1770
Manganese	µg/g		1	180	105	251	138	223	238	181
Mercury	µg/g		0.01	0.07	0.04	0.04	0.03	0.03	0.03	0.02
Molybdenum	µg/g		0.2	1.5	1.1	1.7	1.5	1.7	1.8	1.1
Nickel	µg/g		0.5	32.0	19.7	26.3	19.9	20.5	22.5	16.8
Phosphorus	µg/g		5	1700	911	542	398	325	330	511
Potassium	µg/g		5	1860	1850	1920	1600	1580	1580	1200
Selenium	µg/g		0.1	2.9	1.1	0.9	0.6	0.6	0.7	0.7
Silver	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sodium	µg/g		5	65	128	69	76	71	69	119
Strontium	µg/g		1	45	25	31	24	25	26	29
Thallium	µg/g		0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1
Tin	µg/g		0.2	0.5	0.5	0.5	0.5	0.7	0.7	0.3
Titanium	µg/g		1	52	64	94	118	122	109	85
Uranium	µg/g		0.2	6.6	1.4	1.4	1.2	0.8	1.0	1.2
Vanadium	µg/g		1	50	36	45	45	51	53	25

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AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Metals in Soil

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

			SAMPLE DESCRIPTION:	03813-06	03813-07	03813-08	03813-09	03831-07	03831-08	03832-05
			SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil
			DATE SAMPLED:	2017-07-18	2017-07-18	2017-07-18	2017-07-18	2017-07-19	2017-07-19	2017-07-19
Parameter	Unit	G / S	RDL	8582896	8582899	8582902	8582903	8582995	8582996	8583007
Zinc	µg/g		1	46	75	78	64	248	212	53
Zirconium	µg/g		0.1	1.5	1.1	3.4	1.9	1.4	1.0	2.5
pH 1:2	pH units		0.05	5.42	5.24	5.62	5.32	5.26	5.07	5.41

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8582701-8583007 Results are based on the dry weight of the sample

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SAMPLING SITE:

SAMPLED BY:

Soil Analysis - (SWEP) - NO2,NO3,Cyanide, Fluoride

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03826-07	03826-08
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2017-07-18	2017-07-18
Parameter	Unit	G / S	RDL	8582785	8582786
Fluoride - Leachate (SWEP)	mg/L	150	0.5	<0.5	<0.5
Nitrate - Leachate (SWEP)	mg/L	1000	0.5	<0.5	<0.5
Nitrite - Leachate (SWEP)	mg/L	1000	0.5	<0.5	<0.5
Cyanide - Leachate (SWEP)	mg/L	20	0.002	<0.002	<0.002

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to NORTHERN ROCKIES
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8582785-8582786 Analysis based on 'as received'.
Analysis performed at AGAT Calgary.

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SAMPLING SITE:

SAMPLED BY:

Soil Salinity - Na & Cl

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03823-05	03823-06	03823-11	03824-03	03824-12	03825-05	03825-09	03827-06
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-16	2017-07-16	2017-07-16	2017-07-17	2017-07-17	2017-07-17	2017-07-18	2017-07-19
Parameter	Unit	G / S	RDL	8582693	8582695	8582701	8582708	8582746	8582766	8582770	8582820
Chloride, Soluble	mg/L		2	3	5	5	4	4	<2	35	12
Sodium, Soluble	mg/L		2	10	12	2	3	3	3	17	8
Saturation Percentage	%		0.1	57.4	53.4	45.2	49.9	50.2	43.8	43.6	39.9
Chloride, Soluble (mg/kg)	mg/kg		2	<2	3	2	2	2	<2	15	5
Sodium, Soluble (mg/kg)	mg/kg		2	6	6	<2	<2	<2	<2	7	3

		SAMPLE DESCRIPTION:		03827-10	03811-01	03811-02	03811-03	03811-04	03811-05		03811-06
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil		Soil
		DATE SAMPLED:		2017-07-19	2017-07-17	2017-07-17	2017-07-17	2017-07-17	2017-07-17		2017-07-17
Parameter	Unit	G / S	RDL	8582832	8582868	8582874	8582877	8582879	8582882	RDL	8582883
Chloride, Soluble	mg/L		2	6	10	5	7	117	176	4	266
Sodium, Soluble	mg/L		2	6	16	3	39	123	117	2	170
Saturation Percentage	%		0.1	47.9	57.4	61.9	45.7	39.4	58.5	0.1	58.8
Chloride, Soluble (mg/kg)	mg/kg		2	3	6	3	3	46	103	2	156
Sodium, Soluble (mg/kg)	mg/kg		2	3	9	<2	18	48	68	2	100

		SAMPLE DESCRIPTION:		03811-07	03813-01	03813-03	03813-05	03813-06	03813-08	03831-07	03831-08
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-17	2017-07-18	2017-07-18	2017-07-18	2017-07-18	2017-07-18	2017-07-19	2017-07-19
Parameter	Unit	G / S	RDL	8582884	8582885	8582890	8582893	8582896	8582902	8582995	8582996
Chloride, Soluble	mg/L		2	102	6	7	7	6	3	7	6
Sodium, Soluble	mg/L		2	88	4	6	3	2	<2	6	5
Saturation Percentage	%		0.1	39.0	98.1	64.8	169	108	55.3	47.4	51.0
Chloride, Soluble (mg/kg)	mg/kg		2	40	6	5	12	6	<2	3	3
Sodium, Soluble (mg/kg)	mg/kg		2	34	4	4	5	2	<2	3	3

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ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Soil Salinity - Na & Cl

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03832-05
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2017-07-19
Parameter	Unit	G / S	RDL	8583007
Chloride, Soluble	mg/L		2	5
Sodium, Soluble	mg/L		2	15
Saturation Percentage	%		0.1	33.9
Chloride, Soluble (mg/kg)	mg/kg		2	<2
Sodium, Soluble (mg/kg)	mg/kg		2	5

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8582868 Due to the insufficient sample volume, less than the recommended sample volume was used for analysis of saturated paste.

8582885 Due to the insufficient sample volume, less than the recommended sample volume was used for analysis of saturated paste.

8582893 Due to the insufficient sample volume, less than the recommended sample volume was used for analysis of saturated paste.

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SAMPLING SITE:

SAMPLED BY:

Total Organic Carbon in Soil (%)

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03813-01	03813-03	03813-05	03813-06	03813-08
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-18	2017-07-18	2017-07-18	2017-07-18	2017-07-18
Parameter	Unit	G / S	RDL	8582885	8582890	8582893	8582896	8582902
Organic Carbon-Total	%		0.02	5.37	5.00	21.9	14.5	1.23

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH Silica Gel in Soil Low Level

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

SAMPLE DESCRIPTION:				03813-01		03813-03	03813-05	03813-06		03813-08
SAMPLE TYPE:				Soil		Soil	Soil	Soil		Soil
DATE SAMPLED:				2017-07-18		2017-07-18	2017-07-18	2017-07-18		2017-07-18
Parameter	Unit	G / S	RDL	8582885	RDL	8582890	8582893	8582896	RDL	8582902
Naphthalene	µg/g		0.005	<0.005	0.01	0.19	<0.01	<0.01	0.005	<0.005
2-Methylnaphthalene	µg/g		0.005	<0.005	0.01	0.08	<0.01	<0.01	0.005	<0.005
1-Methylnaphthalene	µg/g		0.005	<0.005	0.01	0.10	0.01	<0.01	0.005	<0.005
Acenaphthylene	µg/g		0.005	<0.005	0.01	0.02	<0.01	<0.01	0.005	<0.005
Acenaphthene	µg/g		0.005	<0.005	0.01	<0.01	<0.01	<0.01	0.005	<0.005
Fluorene	µg/g		0.02	<0.02	0.04	0.05	<0.04	<0.04	0.02	<0.02
Phenanthrene	µg/g		0.02	<0.02	0.04	0.22	<0.04	<0.04	0.02	<0.02
Anthracene	µg/g		0.004	<0.004	0.008	0.032	<0.008	<0.008	0.004	<0.004
Fluoranthene	µg/g		0.01	<0.01	0.02	0.07	<0.02	<0.02	0.01	<0.01
Pyrene	µg/g		0.01	<0.01	0.02	0.11	<0.02	<0.02	0.01	<0.01
Benzo(a)anthracene	µg/g		0.03	<0.03	0.06	<0.06	<0.06	<0.06	0.03	<0.03
Chrysene	µg/g		0.05	<0.05	0.1	<0.1	<0.1	<0.1	0.05	<0.05
Benzo(b)fluoranthene	µg/g		0.05	<0.05	0.1	<0.1	<0.1	<0.1	0.05	<0.05
Benzo(j)fluoranthene	µg/g		0.05	<0.05	0.1	<0.1	<0.1	<0.1	0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	0.1	<0.1	<0.1	<0.1	0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	<0.03	0.06	<0.06	<0.06	<0.06	0.03	<0.03
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	0.04	<0.04	<0.04	<0.04	0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.005	<0.005	0.01	<0.01	<0.01	<0.01	0.005	<0.005
Benzo(g,h,i)perylene	µg/g		0.05	<0.05	0.1	<0.1	<0.1	<0.1	0.05	<0.05
Quinoline	µg/g		0.05	<0.05	0.1	<0.1	<0.1	<0.1	0.05	<0.05
IACR CCME (Soil)	µg/g		0.6	<0.6	1	<1	<1	<1	0.6	<0.6
B[a]P TPE (Soil)	µg/g		0.05	<0.05	0.1	<0.1	<0.1	<0.1	0.05	<0.05
EPH C10-C19sg	µg/g		20	38	40	102	<40	<40	20	<20
EPH C19-C32sg	µg/g		20	347	40	423	74	<40	20	<20
LEPH C10-C19sg	µg/g		20	38	40	101	<40	<40	20	<20
HEPH C19-C32sg	µg/g		20	347	40	422	74	<40	20	<20
Benzo(b+j)fluoranthene	µg/g		0.05	<0.05	0.05	<0.05	<0.05	<0.05	0.05	<0.05

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Certificate of Analysis

AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH Silica Gel in Soil Low Level

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:	03813-01	03813-03	03813-05	03813-06	03813-08
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	2017-07-18	2017-07-18	2017-07-18	2017-07-18	2017-07-18
Surrogate	Unit	Acceptable Limits	8582885	8582890	8582893	8582896	8582902
Naphthalene - d8	%	50-130	92	118	117	115	103
2-Fluorobiphenyl	%	50-130	85	109	111	112	93
P-Terphenyl - d14	%	60-130	105	113	122	119	115

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8582885 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.

8582890-8582896 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
EPH & PAH detection limits increased due to high sample moisture content.

8582902 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.

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AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03823-01	03823-04	03823-05	03823-06	03823-08	03823-12	03824-02	03824-05
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-16	2017-07-16	2017-07-16	2017-07-16	2017-07-16	2017-07-16	2017-07-16	2017-07-17
Parameter	Unit	G / S	RDL	8582689	8582692	8582693	8582695	8582698	8582704	8582706	8582711
Naphthalene	µg/g		0.005	<0.005	0.025	<0.005	<0.005	<0.005	<0.005	0.027	0.006
2-Methylnaphthalene	µg/g		0.005	<0.005	0.126	<0.005	<0.005	<0.005	<0.005	0.170	0.011
1-Methylnaphthalene	µg/g		0.005	0.006	0.085	0.023	0.014	0.013	0.062	0.105	0.015
Acenaphthylene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Fluorene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02
Phenanthrene	µg/g		0.02	0.02	0.14	<0.02	<0.02	0.05	0.03	0.14	0.05
Anthracene	µg/g		0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Fluoranthene	µg/g		0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.01	0.01
Pyrene	µg/g		0.01	<0.01	0.04	<0.01	<0.01	0.01	<0.01	0.03	0.01
Benzo(a)anthracene	µg/g		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Chrysene	µg/g		0.05	<0.05	0.06	<0.05	<0.05	0.05	<0.05	<0.05	0.05
Benzo(b)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(j)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.005	0.007	0.005	<0.005	<0.005	0.008	<0.005	<0.005	0.007
Benzo(g,h,i)perylene	µg/g		0.05	<0.05	0.07	<0.05	<0.05	0.08	<0.05	0.06	0.05
Quinoline	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
IACR CCME (Soil)	µg/g		0.6	0.6	0.6	<0.6	<0.6	0.6	<0.6	<0.6	0.6
B[a]P TPE (Soil)	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EPH C10-C19	µg/g		20	<20	26	313	252	50	123	27	20
EPH C19-C32	µg/g		20	34	27	280	284	88	<20	31	30
LEPH C10-C19	µg/g		20	<20	26	313	252	50	123	27	20
HEPH C19-C32	µg/g		20	34	27	280	284	88	<20	31	30
Benzo(b+j)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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Certificate of Analysis

AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:	03823-01	03823-04	03823-05	03823-06	03823-08	03823-12	03824-02	03824-05
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	2017-07-16	2017-07-16	2017-07-16	2017-07-16	2017-07-16	2017-07-16	2017-07-16	2017-07-17
Surrogate	Unit	Acceptable Limits	8582689	8582692	8582693	8582695	8582698	8582704	8582706	8582711
Naphthalene - d8	%	50-130	90	87	117	111	96	91	74	87
2-Fluorobiphenyl	%	50-130	90	84	112	108	93	90	72	85
P-Terphenyl - d14	%	60-130	108	99	112	115	102	105	91	99

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		SAMPLE DESCRIPTION:		03824-08	03824-09	03824-11	03825-01	03825-07	03825-09	03825-11	03826-01
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-17	2017-07-17	2017-07-17	2017-07-17	2017-07-17	2017-07-18	2017-07-18	2017-07-18
Parameter	Unit	G / S	RDL	8582723	8582729	8582741	8582754	8582768	8582770	8582774	8582776
Naphthalene	µg/g		0.005	<0.005	<0.005	0.208	<0.005	<0.005	<0.005	<0.005	0.218
2-Methylnaphthalene	µg/g		0.005	<0.005	<0.005	0.501	<0.005	<0.005	<0.005	<0.005	0.460
1-Methylnaphthalene	µg/g		0.005	<0.005	<0.005	0.334	0.005	0.005	<0.005	0.071	0.317
Acenaphthylene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Fluorene	µg/g		0.02	<0.02	<0.02	0.08	<0.02	<0.02	<0.02	0.10	0.09
Phenanthrene	µg/g		0.02	<0.02	<0.02	0.26	0.02	0.02	<0.02	0.09	0.22
Anthracene	µg/g		0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Fluoranthene	µg/g		0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	0.01	0.02
Pyrene	µg/g		0.01	<0.01	<0.01	0.05	<0.01	<0.01	<0.01	0.01	0.04
Benzo(a)anthracene	µg/g		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Chrysene	µg/g		0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	0.05
Benzo(b)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(j)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.005	<0.005	<0.005	<0.005	0.007	0.006	0.005	<0.005	<0.005
Benzo(g,h,i)perylene	µg/g		0.05	<0.05	<0.05	0.10	<0.05	<0.05	<0.05	<0.05	0.07
Quinoline	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
IACR CCME (Soil)	µg/g		0.6	<0.6	<0.6	0.6	0.6	0.6	<0.6	<0.6	0.6
B[a]P TPE (Soil)	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EPH C10-C19	µg/g		20	<20	<20	50	<20	<20	<20	456	77
EPH C19-C32	µg/g		20	<20	<20	50	26	<20	23	24	35
LEPH C10-C19	µg/g		20	<20	<20	50	<20	<20	<20	456	76
HEPH C19-C32	µg/g		20	<20	<20	49	26	<20	23	24	35
Benzo(b+j)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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Certificate of Analysis

AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-22

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		SAMPLE DESCRIPTION:	03824-08	03824-09	03824-11	03825-01	03825-07	03825-09	03825-11	03826-01
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	2017-07-17	2017-07-17	2017-07-17	2017-07-17	2017-07-17	2017-07-18	2017-07-18	2017-07-18
Surrogate	Unit	Acceptable Limits	8582723	8582729	8582741	8582754	8582768	8582770	8582774	8582776
Naphthalene - d8	%	50-130	89	91	85	89	88	92	102	89
2-Fluorobiphenyl	%	50-130	87	89	84	88	87	93	94	88
P-Terphenyl - d14	%	60-130	101	101	96	100	99	111	101	99

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		SAMPLE DESCRIPTION:		03826-06	03826-12	03827-03	03827-04	03827-08	03827-11	03831-04	03831-05
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-18	2017-07-18	2017-07-18	2017-07-18	2017-07-19	2017-07-19	2017-07-18	2017-07-18
Parameter	Unit	G / S	RDL	8582782	8582794	8582809	8582811	8582829	8582833	8582992	8582993
Naphthalene	µg/g		0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	0.010	<0.005
2-Methylnaphthalene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	0.008	0.013	0.042	0.095
1-Methylnaphthalene	µg/g		0.005	<0.005	0.015	0.006	0.008	0.012	0.022	0.046	0.078
Acenaphthylene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Fluorene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03
Phenanthrene	µg/g		0.02	0.09	0.06	0.05	0.07	0.04	0.06	0.08	0.29
Anthracene	µg/g		0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Fluoranthene	µg/g		0.01	0.01	0.01	0.01	0.01	<0.01	<0.01	0.03	0.02
Pyrene	µg/g		0.01	0.03	0.03	<0.01	<0.01	0.02	0.01	0.07	0.05
Benzo(a)anthracene	µg/g		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Chrysene	µg/g		0.05	0.07	0.06	<0.05	<0.05	0.05	<0.05	0.08	0.10
Benzo(b)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05
Benzo(j)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	<0.005
Benzo(g,h,i)perylene	µg/g		0.05	0.06	0.06	<0.05	<0.05	<0.05	0.07	0.09	0.09
Quinoline	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
IACR CCME (Soil)	µg/g		0.6	0.6	0.6	<0.6	<0.6	<0.6	<0.6	0.8	0.6
B[a]P TPE (Soil)	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EPH C10-C19	µg/g		20	104	121	<20	<20	48	126	43	365
EPH C19-C32	µg/g		20	126	181	<20	<20	54	163	76	438
LEPH C10-C19	µg/g		20	104	121	<20	<20	48	126	43	365
HEPH C19-C32	µg/g		20	126	180	<20	<20	53	163	76	438
Benzo(b+j)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05

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SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-22

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		SAMPLE DESCRIPTION:	03826-06	03826-12	03827-03	03827-04	03827-08	03827-11	03831-04	03831-05
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	2017-07-18	2017-07-18	2017-07-18	2017-07-18	2017-07-19	2017-07-19	2017-07-18	2017-07-18
Surrogate	Unit	Acceptable Limits	8582782	8582794	8582809	8582811	8582829	8582833	8582992	8582993
Naphthalene - d8	%	50-130	98	104	90	91	100	105	97	78
2-Fluorobiphenyl	%	50-130	92	94	90	91	88	88	84	72
P-Terphenyl - d14	%	60-130	97	95	102	104	103	102	101	95

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DATE RECEIVED: 2017-07-22

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		SAMPLE DESCRIPTION:		03831-06	03831-09		03831-10	03831-12		03832-02	03832-04
		SAMPLE TYPE:		Soil	Soil		Soil	Soil		Soil	Soil
		DATE SAMPLED:		2017-07-18	2017-07-19		2017-07-19	2017-07-19		2017-07-19	2017-07-19
Parameter	Unit	G / S	RDL	8582994	8582998	RDL	8582999	8583001	RDL	8583004	8583006
Naphthalene	µg/g		0.005	0.029	0.124	0.05	1.09	1.25	0.005	0.028	0.062
2-Methylnaphthalene	µg/g		0.005	0.119	0.685	0.05	2.15	2.21	0.005	0.095	0.402
1-Methylnaphthalene	µg/g		0.005	0.092	0.478	0.05	1.47	1.52	0.005	0.080	0.270
Acenaphthylene	µg/g		0.005	<0.005	<0.005	0.05	<0.05	<0.05	0.005	<0.005	<0.005
Acenaphthene	µg/g		0.005	<0.005	<0.005	0.05	<0.05	<0.05	0.005	<0.005	<0.005
Fluorene	µg/g		0.02	0.03	<0.02	0.2	<0.2	<0.2	0.02	0.05	0.10
Phenanthrene	µg/g		0.02	0.19	0.03	0.2	0.5	0.5	0.02	0.25	0.39
Anthracene	µg/g		0.004	<0.004	<0.004	0.04	<0.04	<0.04	0.004	<0.004	<0.004
Fluoranthene	µg/g		0.01	0.02	<0.01	0.01	0.04	0.04	0.01	0.02	0.02
Pyrene	µg/g		0.01	0.05	<0.01	0.01	0.08	0.07	0.01	0.05	0.05
Benzo(a)anthracene	µg/g		0.03	<0.03	<0.03	0.03	<0.03	<0.03	0.03	<0.03	<0.03
Chrysene	µg/g		0.05	0.10	<0.05	0.05	0.12	0.11	0.05	0.10	0.11
Benzo(b)fluoranthene	µg/g		0.05	<0.05	<0.05	0.05	0.05	0.05	0.05	<0.05	0.05
Benzo(j)fluoranthene	µg/g		0.05	<0.05	<0.05	0.05	<0.05	<0.05	0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	0.05	<0.05	<0.05	0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	<0.03	<0.03	0.03	0.03	0.03	0.03	<0.03	<0.03
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	<0.02	0.02	<0.02	<0.02	0.02	<0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.005	<0.005	<0.005	0.005	0.006	0.005	0.005	<0.005	<0.005
Benzo(g,h,i)perylene	µg/g		0.05	0.09	<0.05	0.05	0.16	0.15	0.05	0.09	0.10
Quinoline	µg/g		0.05	<0.05	<0.05	0.5	<0.5	<0.5	0.05	<0.05	<0.05
IACR CCME (Soil)	µg/g		0.6	0.6	<0.6	0.6	0.8	0.8	0.6	0.6	0.7
B[a]P TPE (Soil)	µg/g		0.05	<0.05	<0.05	0.05	0.05	0.05	0.05	<0.05	<0.05
EPH C10-C19	µg/g		20	292	157	20	101	100	20	398	262
EPH C19-C32	µg/g		20	417	24	20	100	100	20	470	349
LEPH C10-C19	µg/g		20	292	156	20	100	98	20	398	262
HEPH C19-C32	µg/g		20	417	24	20	100	100	20	470	349
Benzo(b+j)fluoranthene	µg/g		0.05	<0.05	<0.05	0.05	0.05	0.05	0.05	<0.05	0.05

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Certificate of Analysis

AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:	03831-06	03831-09	03831-10	03831-12	03832-02	03832-04
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	2017-07-18	2017-07-19	2017-07-19	2017-07-19	2017-07-19	2017-07-19
Surrogate	Unit	Acceptable Limits	8582994	8582998	8582999	8583001	8583004	8583006
Naphthalene - d8	%	50-130	84	97	80	70	67	86
2-Fluorobiphenyl	%	50-130	71	87	72	64	63	76
P-Terphenyl - d14	%	60-130	94	102	92	89	85	97

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PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03832-06	03832-08		03832-11
		SAMPLE TYPE:		Soil	Soil		Soil
		DATE SAMPLED:		2017-07-19	2017-07-19		2017-07-19
Parameter	Unit	G / S	RDL	8583009	8583011	RDL	8583016
Naphthalene	µg/g		0.005	0.047	0.169	0.05	1.34
2-Methylnaphthalene	µg/g		0.005	0.094	0.870	0.05	2.40
1-Methylnaphthalene	µg/g		0.005	0.089	0.541	0.05	1.59
Acenaphthylene	µg/g		0.005	<0.005	<0.005	0.05	<0.05
Acenaphthene	µg/g		0.005	<0.005	<0.005	0.05	<0.05
Fluorene	µg/g		0.02	<0.02	0.16	0.2	<0.2
Phenanthrene	µg/g		0.02	0.11	0.41	0.2	0.5
Anthracene	µg/g		0.004	0.109	<0.004	0.04	<0.04
Fluoranthene	µg/g		0.01	0.01	0.03	0.01	0.03
Pyrene	µg/g		0.01	0.04	0.06	0.01	0.07
Benzo(a)anthracene	µg/g		0.03	<0.03	<0.03	0.03	<0.03
Chrysene	µg/g		0.05	0.08	0.11	0.05	0.11
Benzo(b)fluoranthene	µg/g		0.05	0.05	0.05	0.05	0.05
Benzo(j)fluoranthene	µg/g		0.05	<0.05	<0.05	0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	<0.03	<0.03	0.03	0.03
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	<0.02	0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.005	<0.005	<0.005	0.005	<0.005
Benzo(g,h,i)perylene	µg/g		0.05	0.07	0.12	0.05	0.12
Quinoline	µg/g		0.05	<0.05	<0.05	0.5	<0.5
IACR CCME (Soil)	µg/g		0.6	0.7	0.8	0.6	0.8
B[a]P TPE (Soil)	µg/g		0.05	<0.05	<0.05	0.05	<0.05
EPH C10-C19	µg/g		20	119	74	20	64
EPH C19-C32	µg/g		20	156	100	20	68
LEPH C10-C19	µg/g		20	119	74	20	62
HEPH C19-C32	µg/g		20	156	100	20	68
Benzo(b+j)fluoranthene	µg/g		0.05	0.05	0.05	0.05	0.05

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AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:	03832-06	03832-08	03832-11
		SAMPLE TYPE:	Soil	Soil	Soil
		DATE SAMPLED:	2017-07-19	2017-07-19	2017-07-19
Surrogate	Unit	Acceptable Limits	8583009	8583011	8583016
Naphthalene - d8	%	50-130	97	94	95
2-Fluorobiphenyl	%	50-130	86	86	88
P-Terphenyl - d14	%	60-130	106	109	115

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8582689-8582998 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.

8582999-8583001 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
PAH detection limits increased due to sample matrix interference. Sample extract was diluted.

8583004-8583011 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.

8583016 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
PAH detection limits increased due to sample matrix interference. Sample extract was diluted.

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AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

BTEX / VPH (C6-C10) Soil

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03823-04	03823-07	03823-10	03824-02	03825-04	03825-09	03826-01	03826-04
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-16	2017-07-16	2017-07-16	2017-07-16	2017-07-17	2017-07-18	2017-07-18	2017-07-18
Parameter	Unit	G / S	RDL	8582692	8582697	8582700	8582706	8582764	8582770	8582776	8582779
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
m&p-Xylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05
o-Xylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
VPH	µg/g		10	<10	<10	<10	<10	<10	<10	<10	<10
VH	µg/g		10	<10	<10	<10	<10	<10	<10	<10	<10
Total Xylenes	ug/g		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate	Unit	Acceptable Limits									
Bromofluorobenzene	%	60-140		98	107	98	105	109	110	109	104
Dibromofluoromethane	%	60-140		93	97	92	95	100	100	99	96
Toluene - d8	%	60-140		101	108	102	107	110	113	112	108

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AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

BTEX / VPH (C6-C10) Soil

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03826-06	03826-10	03826-11	03826-12	03827-01	03827-11	03811-04	03813-02
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-18	2017-07-18	2017-07-18	2017-07-18	2017-07-18	2017-07-19	2017-07-17	2017-07-18
Parameter	Unit	G / S	RDL	8582782	8582789	8582791	8582794	8582795	8582833	8582879	8582888
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
m&p-Xylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	0.05
o-Xylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
VPH	µg/g		10	<10	<10	<10	<10	<10	<10	<10	<10
VH	µg/g		10	<10	<10	<10	<10	<10	<10	<10	<10
Total Xylenes	ug/g		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate	Unit	Acceptable Limits									
Bromofluorobenzene	%	60-140		108	105	108	107	113	109	114	111
Dibromofluoromethane	%	60-140		102	95	101	97	102	99	104	99
Toluene - d8	%	60-140		107	109	111	112	113	110	117	112

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AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

BTEX / VPH (C6-C10) Soil

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03813-04	03813-07	03813-09	03832-04	03832-11
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-18	2017-07-18	2017-07-18	2017-07-19	2017-07-19
Parameter	Unit	G / S	RDL	8582891	8582899	8582903	8583006	8583016
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.30
m&p-Xylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	1.36
o-Xylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.81
Styrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
VPH	µg/g		10	<10	<10	<10	22	57
VH	µg/g		10	<10	<10	<10	22	59
Total Xylenes	ug/g		0.1	<0.1	<0.1	<0.1	<0.1	2.2
Surrogate	Unit	Acceptable Limits						
Bromofluorobenzene	%	60-140		114	106	112	109	106
Dibromofluoromethane	%	60-140		102	94	97	95	110
Toluene - d8	%	60-140		116	105	110	108	114

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8582692-8583016 Results are based on dry weight of sample.
VPH results have been corrected for BTEX contributions.

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PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

BTEX / VPH (C6-C10) Water

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03814-02	03814-03	03814-04	03814-07	03830-02	03830-03	03830-05
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-19	2017-07-19	2017-07-19	2017-07-19	2017-07-16	2017-07-16	2017-07-16
Parameter	Unit	G / S	RDL	8582921	8582927	8582931	8582936	8582954	8582957	8582971
Methyl tert-butyl ether (MTBE)	µg/L		1	<1	<1	<1	<1	<1	<1	<1
Benzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L		0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
m&p-Xylene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
o-Xylene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Styrene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
VPH	µg/L		100	<100	<100	<100	<100	<100	<100	<100
VH	µg/L		100	<100	<100	<100	<100	<100	<100	<100
Total Xylenes	ug/L		1	<1	<1	<1	<1	<1	<1	<1
Surrogate	Unit	Acceptable Limits								
Bromofluorobenzene	%	70-130		98	88	110	106	108	108	103
Dibromofluoromethane	%	70-130		102	99	106	93	96	95	90
Toluene - d8	%	70-130		102	107	95	96	97	97	94

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8582921-8582971 VPH results have been corrected for BTEX contributions.

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AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

CCME BTEX/F1-F4 (Water)

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03814-01	03814-05	03814-06
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2017-07-19	2017-07-19	2017-07-19
Parameter	Unit	G / S	RDL	8582904	8582933	8582934
Methyl tert-butyl ether (MTBE)	µg/L		1	<1	<1	<1
Benzene	µg/L		0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L		0.5	<0.5	<0.5	<0.5
Toluene	µg/L		0.5	0.5	<0.5	<0.5
m&p-Xylene	µg/L		0.5	<0.5	<0.5	<0.5
o-Xylene	µg/L		0.5	<0.5	<0.5	<0.5
Styrene	µg/L		0.5	<0.5	<0.5	<0.5
F1 (C6-C10)	µg/L		100	<100	<100	<100
F1 minus BTEX (C6-C10)	µg/L		100	<100	<100	<100
F2 (C10-C16)	µg/L		100	<100	<100	<100
F3 (C16-C34)	µg/L		100	170	250	240
F4 (C34-C50)	µg/L		100	110	<100	<100
VH	µg/L		100	<100	<100	<100
VPH	µg/L		100	<100	<100	<100
Total Xylenes	ug/L		1	<1	<1	<1
Surrogate	Unit	Acceptable Limits				
Bromofluorobenzene	%	70-130		100	109	107
Dibromofluoromethane	%	70-130		102	97	96
Toluene - d8	%	70-130		112	97	97

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PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

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SAMPLING SITE:

SAMPLED BY:

CCME BTEX/F1-F4 (Water)

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8582904-8582934 The F1 (C6 - C10) fraction is determined by integrating the FID chromatogram from the beginning of the n-C6 peak to the apex of the last n-C10 peak.
The C6 - C10 fraction is calculated from the FID toluene response factor.
Quality control for the calibration follows the guidelines set out in the CCME Contaminated Sites Method for Soils.
The (F1 minus BTEX) has been calculated by subtracting the BTEX concentration from Fraction 1.
The C10 - C16 (F2), C16 - C34 (F3), and C34 - C50 (F4) fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Quality control data is available upon request.
Assistance in the interpretation of data is available upon request.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
The chromatogram has returned to baseline by the retention time of nC50.
Extraction and holding times were met for this sample.

Certified By:

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PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Glycols Analysis in Water

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03814-01	03814-05	03814-06
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2017-07-19	2017-07-19	2017-07-19
Parameter	Unit	G / S	RDL	8582904	8582933	8582934
Propylene Glycol	mg/L		10	<10	<10	<10
Monoethylene Glycol	mg/L		10	<10	<10	<10
Diethylene Glycol	mg/L		5	<5	<5	<5
Triethylene Glycol	mg/L		10	<10	<10	<10
Tetraethylene Glycol	mg/L		10	<10	<10	<10
Surrogate	Unit	Acceptable Limits				
Heptanol	%	50-150		110	106	116

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8582904-8582934 Identification based on retention time relative to standards.
Analysis performed at AGAT Calgary.

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Water Low Level

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03814-01	03814-02	03814-03	03814-04	03814-05	03814-06	03814-07	03830-01
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-19	2017-07-19	2017-07-19	2017-07-19	2017-07-19	2017-07-19	2017-07-19	2017-07-16
Parameter	Unit	G / S	RDL	8582904	8582921	8582927	8582931	8582933	8582934	8582936	8582939
Naphthalene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Quinoline	µg/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Acenaphthene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Fluorene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	0.02	0.02	<0.02	<0.02
Phenanthrene	µg/L		0.04	<0.04	<0.04	0.13	0.15	0.14	0.18	0.07	<0.04
Anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acridine	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/L		0.02	<0.02	<0.02	0.02	0.03	0.02	0.03	<0.02	<0.02
Pyrene	µg/L		0.02	<0.02	<0.02	0.02	0.02	<0.02	0.02	<0.02	<0.02
Benzo(a)anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(j)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenzo(a,h)anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1-Methylnaphthalene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EPH C10-C19	µg/L		100	<100	<100	110	<100	<100	<100	<100	<100
EPH C19-C32	µg/L		100	130	200	290	170	170	180	170	<100
LEPH C10-C19	µg/L		100	<100	<100	110	<100	<100	<100	<100	<100
HEPH C19-C32	µg/L		100	130	200	290	170	170	180	170	<100
Benzo(b+j)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Surrogate	Unit	Acceptable Limits									
Naphthalene - d8	%	50-130		79	73	72	71	77	64	73	75
2-Fluorobiphenyl	%	50-130		87	80	78	78	83	71	77	76
P-Terphenyl - d14	%	60-130		100	95	94	95	98	87	92	74

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Certificate of Analysis

AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Water Low Level

DATE RECEIVED: 2017-07-22

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		SAMPLE DESCRIPTION:		03830-02	03830-03	03830-04	03830-05
		SAMPLE TYPE:		Water	Water	Water	Water
		DATE SAMPLED:		2017-07-16	2017-07-16	2017-07-16	2017-07-16
Parameter	Unit	G / S	RDL	8582954	8582957	8582959	8582971
Naphthalene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
Quinoline	µg/L		0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02
Acenaphthene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02
Fluorene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02
Phenanthrene	µg/L		0.04	<0.04	<0.04	<0.04	<0.04
Anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01
Acridine	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02
Pyrene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02
Benzo(a)anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01
Benzo(j)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01
Dibenzo(a,h)anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01
1-Methylnaphthalene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
EPH C10-C19	µg/L		100	<100	<100	<100	<100
EPH C19-C32	µg/L		100	<100	<100	<100	<100
LEPH C10-C19	µg/L		100	<100	<100	<100	<100
HEPH C19-C32	µg/L		100	<100	<100	<100	<100
Benzo(b+j)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01
Surrogate	Unit	Acceptable Limits		8582954	8582957	8582959	8582971
Naphthalene - d8	%	50-130		77	80	74	83
2-Fluorobiphenyl	%	50-130		79	81	76	84
P-Terphenyl - d14	%	60-130		75	78	67	78

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AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

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Public Works LEPH/HEPH in Water Low Level

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8582904-8582971 LEPH & HEPH results have been corrected for PAH contributions.

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CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03823-01	03823-12	03824-06	03824-10	03825-02	03825-07	03825-11	03827-03
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-16	2017-07-16	2017-07-17	2017-07-17	2017-07-17	2017-07-17	2017-07-18	2017-07-18
Parameter	Unit	G / S	RDL	8582689	8582704	8582712	8582730	8582762	8582768	8582774	8582809
Chloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vinyl Chloride	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromomethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acetone	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Butanone (MEK)	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroform	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
1,2-Dichloropropane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethene	µg/g		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromodichloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4-Methyl-2-pentanone (MIBK)	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Toluene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylene Dibromide	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03823-01	03823-12	03824-06	03824-10	03825-02	03825-07	03825-11	03827-03
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-16	2017-07-16	2017-07-17	2017-07-17	2017-07-17	2017-07-17	2017-07-18	2017-07-18
Parameter	Unit	G / S	RDL	8582689	8582704	8582712	8582730	8582762	8582768	8582774	8582809
Chlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
m&p-Xylene	µg/g		0.05	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05
Bromoform	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
o-Xylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
VH	µg/g		10	<10	<10	14	<10	<10	<10	16	<10
VPH	µg/g		10	<10	<10	14	<10	<10	<10	16	<10
Total Xylenes	µg/g		0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Surrogate	Unit	Acceptable Limits									
Bromofluorobenzene	%	60-140		94	98	104	97	94	95	99	111
Dibromofluoromethane	%	60-140		96	99	102	97	99	97	101	101
Toluene - d8	%	60-140		110	113	122	114	114	112	118	116

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SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

SAMPLE DESCRIPTION:				03827-04	03827-08	03813-01	03813-03		03813-05		03813-06
SAMPLE TYPE:				Soil	Soil	Soil	Soil		Soil		Soil
DATE SAMPLED:				2017-07-18	2017-07-19	2017-07-18	2017-07-18		2017-07-18		2017-07-18
Parameter	Unit	G / S	RDL	8582811	8582829	8582885	8582890	RDL	8582893	RDL	8582896
Chloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
Vinyl Chloride	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
Bromomethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
Chloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
Trichlorofluoromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
Acetone	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	2	<2	1	<1
1,1-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
Dichloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1	<0.1	<0.1	<0.1	0.3	<0.3	0.2	<0.2
2-Butanone (MEK)	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	2	<2	1	<1
trans-1,2-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
1,1-Dichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
cis-1,2-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
Chloroform	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
1,2-Dichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
1,1,1-Trichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
Carbon Tetrachloride	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.06	0.04	<0.04
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.06	0.04	<0.04
1,2-Dichloropropane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
Trichloroethene	µg/g		0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.03	0.02	<0.02
Bromodichloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
trans-1,3-Dichloropropene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
4-Methyl-2-pentanone (MIBK)	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	2	<2	1	<1
cis-1,3-Dichloropropene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
1,1,2-Trichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
Toluene	µg/g		0.05	<0.05	<0.05	<0.05	0.32	0.2	<0.2	0.1	<0.1
Dibromochloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
Ethylene Dibromide	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
Tetrachloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
1,1,1,2-Tetrachloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1

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Certificate of Analysis

AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03827-04	03827-08	03813-01	03813-03		03813-05		03813-06
		SAMPLE TYPE:		Soil	Soil	Soil	Soil		Soil		Soil
		DATE SAMPLED:		2017-07-18	2017-07-19	2017-07-18	2017-07-18		2017-07-18		2017-07-18
Parameter	Unit	G / S	RDL	8582811	8582829	8582885	8582890	RDL	8582893	RDL	8582896
Chlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
Ethylbenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
m&p-Xylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
Bromoform	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
Styrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
1,1,2,2-Tetrachloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
o-Xylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
1,3-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
1,4-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
1,2-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
1,2,4-Trichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.2	0.1	<0.1
VH	µg/g		10	<10	<10	<10	<10	30	<30	20	<20
VPH	µg/g		10	<10	<10	<10	<10	30	<30	20	<20
Total Xylenes	µg/g		0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	0.2	<0.2
Surrogate	Unit	Acceptable Limits									
Bromofluorobenzene	%	60-140		104	97	95	120		100		91
Dibromofluoromethane	%	60-140		102	93	99	124		113		105
Toluene - d8	%	60-140		117	109	113	135		126		116

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AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03813-08	03831-05	03831-10	03832-02	03832-08
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-18	2017-07-18	2017-07-19	2017-07-19	2017-07-19
Parameter	Unit	G / S	RDL	8582902	8582993	8582999	8583004	8583011
Chloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vinyl Chloride	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromomethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acetone	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Butanone (MEK)	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroform	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02
1,2-Dichloropropane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethene	µg/g		0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromodichloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4-Methyl-2-pentanone (MIBK)	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Toluene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylene Dibromide	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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Certificate of Analysis

AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03813-08	03831-05	03831-10	03832-02	03832-08
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-18	2017-07-18	2017-07-19	2017-07-19	2017-07-19
Parameter	Unit	G / S	RDL	8582902	8582993	8582999	8583004	8583011
Chlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	µg/g		0.05	<0.05	<0.05	0.10	<0.05	<0.05
m&p-Xylene	µg/g		0.05	<0.05	<0.05	0.33	<0.05	0.07
Bromoform	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
o-Xylene	µg/g		0.05	<0.05	<0.05	0.15	<0.05	0.07
1,3-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
VH	µg/g		10	<10	28	38	21	50
VPH	µg/g		10	<10	28	38	21	50
Total Xylenes	µg/g		0.2	<0.2	<0.2	0.5	<0.2	<0.2
Surrogate	Unit	Acceptable Limits						
Bromofluorobenzene	%	60-140		105	101	94	105	89
Dibromofluoromethane	%	60-140		121	101	88	94	83
Toluene - d8	%	60-140		137	120	108	115	97

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8582689-8582890 Results are based on dry weight of sample.

8582893-8582896 Results are based on dry weight of sample.
VOC/VPH detection limits increased due to high sample moisture content.

8582902-8583011 Results are based on dry weight of sample.

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Certificate of Analysis

AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Water

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

SAMPLE DESCRIPTION:				03814-01	03814-05	03814-06	03830-01	03830-04
SAMPLE TYPE:				Water	Water	Water	Water	Water
DATE SAMPLED:				2017-07-19	2017-07-19	2017-07-19	2017-07-16	2017-07-16
Parameter	Unit	G / S	RDL	8582904	8582933	8582934	8582939	8582959
Chloromethane	µg/L		1	<1	<1	<1	<1	<1
Vinyl Chloride	µg/L		1	<1	<1	<1	<1	<1
Bromomethane	µg/L		1	<1	<1	<1	<1	<1
Chloroethane	µg/L		1	<1	<1	<1	<1	<1
Trichlorofluoromethane	µg/L		1	<1	<1	<1	<1	<1
Acetone	µg/L		10	<10	<10	<10	<10	<10
1,1-Dichloroethene	µg/L		1	<1	<1	<1	<1	<1
Dichloromethane	µg/L		1	<1	<1	<1	<1	<1
Methyl tert-butyl ether (MTBE)	µg/L		1	<1	<1	<1	<1	<1
2-Butanone (MEK)	µg/L		10	<10	<10	<10	<10	<10
trans-1,2-Dichloroethylene	µg/L		1	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L		1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethylene	µg/L		1	<1	<1	<1	<1	<1
Chloroform	µg/L		1	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L		1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	µg/L		1	<1	<1	<1	<1	<1
Carbon Tetrachloride	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	µg/L		1	<1	<1	<1	<1	<1
Trichloroethene	µg/L		1	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L		1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	µg/L		1	<1	<1	<1	<1	<1
4-Methyl-2-pentanone (MIBK)	µg/L		10	<10	<10	<10	<10	<10
cis-1,3-Dichloropropene	µg/L		1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	µg/L		1	<1	<1	<1	<1	<1
Toluene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	µg/L		1	<1	<1	<1	<1	<1
Ethylene Dibromide	µg/L		0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Tetrachloroethene	µg/L		1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	µg/L		1	<1	<1	<1	<1	<1

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CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Water

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03814-01	03814-05	03814-06	03830-01	03830-04
		SAMPLE TYPE:		Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-19	2017-07-19	2017-07-19	2017-07-16	2017-07-16
Parameter	Unit	G / S	RDL	8582904	8582933	8582934	8582939	8582959
Chlorobenzene	µg/L		1	<1	<1	<1	<1	<1
Ethylbenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5
m&p-Xylene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	µg/L		1	<1	<1	<1	<1	<1
Styrene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	µg/L		1	<1	<1	<1	<1	<1
o-Xylene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	µg/L		1	<1	<1	<1	<1	<1
VH	µg/L		100	<100	<100	<100	<100	<100
VPH	µg/L		100	<100	<100	<100	<100	<100
Total Trihalomethanes	µg/L		2	<2	<2	<2	<2	<2
Total Xylenes	µg/L		1	<1	<1	<1	<1	<1
Surrogate	Unit	Acceptable Limits						
Bromofluorobenzene	%	70-130		87	89	88	88	89
Dibromofluoromethane	%	70-130		87	87	86	86	87
Toluene - d8	%	70-130		103	104	103	103	103

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

British Columbia CSR - Schedule 6 Total Metals

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03814-01	03814-02	03814-03	03814-04	03814-05	03814-06	03814-07
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-19	2017-07-19	2017-07-19	2017-07-19	2017-07-19	2017-07-19	2017-07-19
Parameter	Unit	G / S	RDL	8582904	8582921	8582927	8582931	8582933	8582934	8582936
Aluminum Total	µg/L		5	107	2190	1450	1350	2240	2080	1560
Antimony Total	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Arsenic Total	µg/L		0.1	0.8	1.6	1.3	0.7	0.9	0.9	0.6
Barium Total	µg/L		0.5	324	312	383	94.3	112	108	94.9
Beryllium Total	µg/L		0.05	<0.05	0.12	0.08	0.09	0.13	0.13	0.15
Boron Total	µg/L		5	17	26	32	11	12	13	9
Cadmium Total	µg/L		0.01	0.01	0.18	0.05	0.12	0.14	0.13	0.14
Calcium Total	µg/L		50	45000	43300	54200	6840	6830	6830	7500
Chromium Total	µg/L		0.5	<0.5	2.8	1.8	1.8	2.8	2.6	1.6
Cobalt Total	µg/L		0.05	0.38	1.34	0.91	1.00	1.29	1.30	3.33
Copper Total	µg/L		0.5	3.1	6.6	6.6	7.1	8.2	11.9	3.4
Iron Total	µg/L		10	334	2470	1970	1420	1990	1790	987
Lead Total	µg/L		0.05	0.23	1.85	1.67	1.08	1.15	1.11	0.70
Lithium Total	µg/L		0.5	2.4	4.5	3.4	3.5	3.9	4.2	3.1
Magnesium Total	µg/L		50	6560	7440	7480	1840	1910	1860	2030
Manganese Total	µg/L		1	72	113	61	33	42	40	79
Mercury Total	µg/L		0.01	0.01	0.02	<0.01	0.04	0.04	0.02	0.05
Molybdenum Total	µg/L		0.1	0.7	1.1	1.9	0.1	0.2	0.2	0.2
Nickel Total	µg/L		0.5	1.9	5.1	4.4	6.0	7.2	6.6	6.2
Potassium Total	µg/L		100	2400	3350	2990	1060	1410	1390	288
Selenium Total	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	0.7	0.7	0.7
Silver Total	µg/L		0.02	<0.02	0.14	<0.02	<0.02	0.03	0.03	<0.02
Sodium Total	µg/L		100	1270	2380	712	614	643	671	688
Thallium Total	µg/L		0.02	<0.02	0.05	0.03	<0.02	0.03	0.03	<0.02
Titanium Total	µg/L		1	2	18	12	7	12	13	6
Uranium Total	µg/L		0.01	0.29	0.16	0.52	0.23	0.28	0.26	0.39
Vanadium Total	µg/L		1	1	7	5	3	5	5	3
Zinc Total	µg/L		5	<5	33	13	9	12	16	7
Total Hardness (calc)	ug CaCO3/L		100	139000	139000	166000	24700	24900	24700	27100

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Certificate of Analysis

AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

British Columbia CSR - Schedule 6 Total Metals

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:

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AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Chloride in Water

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

SAMPLE DESCRIPTION:				03814-01	03814-02	03814-03	03814-04	03814-05	03814-06	03814-07
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2017-07-19	2017-07-19	2017-07-19	2017-07-19	2017-07-19	2017-07-19	2017-07-19
Parameter	Unit	G / S	RDL	8582904	8582921	8582927	8582931	8582933	8582934	8582936
Chloride	mg/L		0.05	0.40	1.03	0.16	<0.05	0.06	0.06	0.06

SAMPLE DESCRIPTION:			03830-02	03830-03	03830-05	
SAMPLE TYPE:			Water	Water	Water	
DATE SAMPLED:			2017-07-16	2017-07-16	2017-07-16	
Parameter	Unit	G / S	RDL	8582954	8582957	8582971
Chloride	mg/L		5	2720	2720	696

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8582954-8582971 Due to matrix interferences sample was diluted for Anions analysis, detection limits have been adjusted accordingly.

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AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03814-01	03814-02	03814-03	03814-04	03814-05	03814-06	03814-07	03830-01
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-19	2017-07-19	2017-07-19	2017-07-19	2017-07-19	2017-07-19	2017-07-19	2017-07-16
Parameter	Unit	G / S	RDL	8582904	8582921	8582927	8582931	8582933	8582934	8582936	8582939
Aluminum Dissolved	µg/L		2	7	14	9	709	698	608	949	3
Antimony Dissolved	µg/L		0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arsenic Dissolved	µg/L		0.1	1.0	1.0	0.5	0.7	0.3	0.7	0.7	0.2
Barium Dissolved	µg/L		0.2	293	221	215	72.7	108	76.1	92.6	137
Beryllium Dissolved	µg/L		0.01	<0.01	0.01	<0.01	0.08	0.07	0.08	0.11	0.02
Bismuth Dissolved	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Boron Dissolved	µg/L		2	14	20	19	7	8	8	5	108
Cadmium Dissolved	µg/L		0.01	0.01	0.08	0.01	0.13	0.11	0.10	0.16	<0.01
Calcium Dissolved	µg/L		50	45500	43100	44000	7020	6180	6180	5730	51200
Chromium Dissolved	µg/L		0.5	<0.5	<0.5	<0.5	1.0	1.0	1.0	1.5	<0.5
Cobalt Dissolved	µg/L		0.05	0.30	0.32	0.14	1.21	0.78	0.77	2.22	<0.05
Copper Dissolved	µg/L		0.2	1.9	2.3	2.6	4.2	8.2	7.6	3.0	<0.2
Iron Dissolved	µg/L		10	149	78	54	942	801	805	969	2240
Lead Dissolved	µg/L		0.05	0.09	0.10	0.06	0.33	0.53	0.49	0.55	<0.05
Lithium Dissolved	µg/L		0.5	2.2	2.2	1.9	2.7	3.0	2.8	2.8	74.8
Magnesium Dissolved	µg/L		50	6640	7240	6640	1880	1600	1600	1540	15600
Manganese Dissolved	µg/L		1	61	58	7	54	30	30	64	296
Mercury Dissolved	µg/L		0.01	0.01	0.02	0.02	0.04	0.04	0.04	0.05	<0.01
Molybdenum Dissolved	µg/L		0.05	0.71	0.94	1.87	0.11	0.12	0.10	0.17	0.24
Nickel Dissolved	µg/L		0.2	1.9	2.0	1.7	4.9	5.2	5.1	4.0	<0.2
Potassium Dissolved	µg/L		50	2390	1760	2290	962	1140	1090	219	1410
Selenium Dissolved	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Silicon Dissolved	µg/L		50	1960	1840	2070	2470	2700	2600	2560	5100
Silver Dissolved	µg/L		0.02	<0.02	0.03	0.03	0.02	0.04	<0.02	<0.02	<0.02
Sodium Dissolved	µg/L		50	1220	1840	583	622	567	551	547	9680
Strontium Dissolved	µg/L		0.1	104	89.4	89.1	23.2	20.6	19.0	19.2	220
Sulphur Dissolved	µg/L		500	1620	695	1870	985	879	926	738	4970
Thallium Dissolved	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tin Dissolved	µg/L		0.05	<0.05	0.16	<0.05	<0.05	0.16	0.07	0.16	0.06
Titanium Dissolved	µg/L		0.5	1.2	1.3	1.2	4.2	7.5	4.9	10.8	1.3

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Certificate of Analysis

AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03814-01	03814-02	03814-03	03814-04	03814-05	03814-06	03814-07	03830-01
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-19	2017-07-19	2017-07-19	2017-07-19	2017-07-19	2017-07-19	2017-07-19	2017-07-16
Parameter	Unit	G / S	RDL	8582904	8582921	8582927	8582931	8582933	8582934	8582936	8582939
Uranium Dissolved	µg/L		0.01	0.28	0.07	0.23	0.19	0.19	0.20	0.28	0.02
Vanadium Dissolved	µg/L		0.5	<0.5	0.5	<0.5	1.3	1.2	0.9	1.9	<0.5
Zinc Dissolved	µg/L		2	3	9	<2	8	8	6	7	<2
Zirconium Dissolved	µg/L		0.1	0.2	0.2	0.2	1.6	2.0	1.9	1.7	<0.1
Hardness (calc)	ug CaCO3/L		100	141000	137000	137000	25300	22000	22000	20600	192000

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Public Works Dissolved Metals

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

SAMPLE DESCRIPTION:				03830-02	03830-03		03830-04		03830-05
SAMPLE TYPE:				Water	Water		Water		Water
DATE SAMPLED:				2017-07-16	2017-07-16		2017-07-16		2017-07-16
Parameter	Unit	G / S	RDL	8582954	8582957	RDL	8582959	RDL	8582971
Aluminum Dissolved	µg/L		2	4	4	2	<2	2	2
Antimony Dissolved	µg/L		0.2	0.4	0.4	0.2	<0.2	0.2	<0.2
Arsenic Dissolved	µg/L		0.1	0.5	0.7	0.1	0.2	0.1	<0.1
Barium Dissolved	µg/L		0.2	2340	2300	1.0	220	0.2	1310
Beryllium Dissolved	µg/L		0.01	0.01	<0.01	0.01	0.01	0.01	<0.01
Bismuth Dissolved	µg/L		0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.05
Boron Dissolved	µg/L		2	100	92	2	253	2	214
Cadmium Dissolved	µg/L		0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01
Calcium Dissolved	µg/L		250	660000	688000	50	54200	50	300000
Chromium Dissolved	µg/L		0.5	<0.5	<0.5	0.5	<0.5	0.5	<0.5
Cobalt Dissolved	µg/L		0.05	0.12	0.12	0.05	0.29	0.05	<0.05
Copper Dissolved	µg/L		0.2	<0.2	<0.2	0.2	<0.2	0.2	<0.2
Iron Dissolved	µg/L		10	34700	34200	10	848	10	1750
Lead Dissolved	µg/L		0.05	3.74	3.77	0.05	<0.05	0.05	<0.05
Lithium Dissolved	µg/L		2.5	150	147	2.5	132	2.5	174
Magnesium Dissolved	µg/L		50	249000	245000	50	19800	50	91300
Manganese Dissolved	µg/L		1	1400	1390	1	799	1	597
Mercury Dissolved	µg/L		0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01
Molybdenum Dissolved	µg/L		0.05	0.06	0.06	0.05	<0.05	0.05	<0.05
Nickel Dissolved	µg/L		0.2	0.3	0.2	0.2	<0.2	0.2	<0.2
Potassium Dissolved	µg/L		50	6890	6940	50	1980	50	4390
Selenium Dissolved	µg/L		0.5	<0.5	<0.5	0.5	<0.5	0.5	<0.5
Silicon Dissolved	µg/L		50	6170	6110	50	5830	50	4590
Silver Dissolved	µg/L		0.02	<0.02	<0.02	0.02	<0.02	0.02	<0.02
Sodium Dissolved	µg/L		250	452000	460000	50	11700	50	62000
Strontium Dissolved	µg/L		0.5	2690	2570	0.1	691	0.5	2570
Sulphur Dissolved	µg/L		500	11300	11000	500	2310	500	4470
Thallium Dissolved	µg/L		0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01
Tin Dissolved	µg/L		0.05	0.06	0.06	0.05	0.10	0.05	0.08
Titanium Dissolved	µg/L		0.5	5.2	6.0	0.5	1.3	0.5	1.7

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Certificate of Analysis

AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-07-22

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		03830-02	03830-03		03830-04		03830-05
		SAMPLE TYPE:		Water	Water		Water		Water
		DATE SAMPLED:		2017-07-16	2017-07-16		2017-07-16		2017-07-16
Parameter	Unit	G / S	RDL	8582954	8582957	RDL	8582959	RDL	8582971
Uranium Dissolved	µg/L		0.01	0.01	0.01	0.01	0.16	0.01	<0.01
Vanadium Dissolved	µg/L		0.5	<0.5	<0.5	0.5	<0.5	0.5	<0.5
Zinc Dissolved	µg/L		2	<2	<2	2	<2	2	16
Zirconium Dissolved	µg/L		0.1	<0.1	<0.1	0.1	<0.1	0.1	<0.1
Hardness (calc)	ug CaCO3/L		100	2670000	2730000	100	217000	100	1130000

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8582954-8582957 Due to matrix interferences sample was diluted for metals analysis, detection limits have been adjusted accordingly.

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
AGAT WORK ORDER: 17N240971
PROJECT: 1657709.5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

Soil Analysis

RPT Date: Aug 24, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Public Works Metals in Soil															
Aluminum	8594324		15100	14700	2.9%	< 10	96%	70%	130%	96%	90%	110%			
Antimony	8594324		0.3	0.2	NA	< 0.1	111%	70%	130%	103%	90%	110%			
Arsenic	8594324		2.9	2.7	6.6%	< 0.1	111%	70%	130%	103%	90%	110%			
Barium	8594324		52.4	55.2	5.2%	< 0.5	96%	70%	130%	104%	90%	110%			
Beryllium	8594324		0.2	0.2	NA	< 0.1	101%	70%	130%	105%	90%	110%			
Bismuth	8594324		<0.5	<0.5	NA	< 0.5				99%	85%	115%			
Cadmium	8594324		0.15	0.13	12.1%	< 0.01	100%	70%	130%	105%	90%	110%			
Calcium	8594324		2680	2640	1.5%	< 10	105%	70%	130%	102%	90%	110%			
Chromium	8594324		18	19	0.6%	< 1	106%	70%	130%	90%	90%	110%			
Cobalt	8594324		5.5	5.3	4.2%	< 0.1	96%	70%	130%	97%	90%	110%			
Copper	8594324		16.4	15.2	7.8%	< 0.2	108%	70%	130%	101%	90%	110%			
Iron	8594324		16800	16700	0.4%	< 10	101%	70%	130%	103%	90%	110%			
Lead	8594324		7.9	7.6	3.7%	< 0.1	91%	70%	130%	97%	90%	110%			
Lithium	8594324		6.1	6.0	2.4%	< 0.5				105%	85%	115%			
Magnesium	8594324		3830	3770	1.7%	< 10	105%	70%	130%	100%	90%	110%			
Manganese	8594324		237	238	0.1%	< 1	106%	70%	130%	98%	90%	110%			
Mercury	8594324		0.04	0.03	NA	< 0.01	106%	70%	130%	104%	90%	110%			
Molybdenum	8594324		0.4	0.4	NA	< 0.2	100%	70%	130%	102%	90%	110%			
Nickel	8594324		14.2	14.0	1.7%	< 0.5	110%	70%	130%	110%	90%	110%			
Phosphorus	8594324		353	377	6.4%	< 5	89%	70%	130%	91%	90%	110%			
Potassium	8594324		398	441	10.2%	< 5	107%	70%	130%	100%	90%	110%			
Selenium	8594324		0.4	0.3	NA	< 0.1				95%	90%	110%			
Silver	8594324		<0.5	<0.5	NA	< 0.5	101%	70%	130%	101%	90%	110%			
Sodium	8594324		267	248	7.3%	< 5	118%	70%	130%	101%	90%	110%			
Strontium	8594324		22	18	20.7%	< 1	110%	70%	130%	100%	90%	110%			
Thallium	8594324		<0.1	<0.1	NA	< 0.1	106%	70%	130%	97%	90%	110%			
Tin	8594324		0.5	0.4	NA	< 0.2	97%	70%	130%	107%	90%	110%			
Titanium	8594324		805	795	1.3%	< 1	104%	70%	130%	102%	90%	110%			
Uranium	8594324		0.3	0.3	NA	< 0.2	94%	70%	130%	100%	90%	110%			
Vanadium	8594324		44	45	2.1%	< 1	122%	70%	130%	97%	90%	110%			
Zinc	8594324		36	35	1.7%	< 1	109%	70%	130%	103%	90%	110%			
Zirconium	8594324		1.3	1.0	27.3%	< 0.1	94%	70%	130%	102%	90%	110%			
pH 1:2	8594324		6.16	6.18	0.3%		100%	90%	110%	100%	95%	105%			
Public Works Metals in Soil															
Aluminum	8592938		4080	3230	23.3%	< 10	99%	70%	130%	103%	90%	110%			
Antimony	8582766	8582766	0.4	0.4	NA	< 0.1	109%	70%	130%	98%	90%	110%			
Arsenic	8582766	8582766	9.4	8.7	7.4%	< 0.1	96%	70%	130%	92%	90%	110%			

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
AGAT WORK ORDER: 17N240971
PROJECT: 1657709.5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

Soil Analysis (Continued)

RPT Date: Aug 24, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Barium	8582766	8582766	547	490	11.0%	< 0.5	101%	70%	130%	101%	90%	110%			
Beryllium	8582766	8582766	0.6	0.6	7.3%	< 0.1	87%	70%	130%	95%	90%	110%			
Bismuth	8582766	8582766	<0.5	<0.5	NA	< 0.5				102%	85%	115%			
Cadmium	8582766	8582766	0.14	0.11	20.6%	< 0.01	103%	70%	130%	97%	90%	110%			
Calcium	8592938		2600	2090	21.8%	< 10	101%	70%	130%	103%	90%	110%			
Chromium	8582766	8582766	17	16	4.8%	< 1	102%	70%	130%	106%	90%	110%			
Cobalt	8582766	8582766	7.6	6.5	16.3%	< 0.1	85%	70%	130%	96%	90%	110%			
Copper	8582766	8582766	23.2	22.4	3.6%	< 0.2	104%	70%	130%	103%	90%	110%			
Iron	8592938		12300	10300	17.2%	< 10	99%	70%	130%	103%	90%	110%			
Lead	8582766	8582766	13.0	11.8	9.8%	< 0.1	94%	70%	130%	100%	90%	110%			
Lithium	8582766	8582766	15.4	14.7	4.9%	< 0.5				101%	85%	115%			
Magnesium	8592938		1690	1410	17.9%	< 10	104%	70%	130%	102%	90%	110%			
Manganese	8582766	8582766	142	124	13.3%	< 1	102%	70%	130%	103%	90%	110%			
Mercury	8582766	8582766	0.04	0.03	NA	< 0.01	79%	70%	130%	101%	90%	110%			
Molybdenum	8582766	8582766	1.0	0.9	NA	< 0.2	100%	70%	130%	100%	90%	110%			
Nickel	8582766	8582766	22.3	21.2	5.1%	< 0.5	106%	70%	130%	99%	90%	110%			
Phosphorus	8592938		962	786	20.2%	< 5	105%	70%	130%	95%	90%	110%			
Potassium	8592938		577	484	17.6%	< 5	97%	70%	130%	109%	90%	110%			
Selenium	8582766	8582766	1.0	1.1	11.0%	< 0.1				96%	90%	110%			
Silver	8582766	8582766	<0.5	<0.5	NA	< 0.5	114%	70%	130%	91%	90%	110%			
Sodium	8592938		63	44	35.5%	< 5	97%	70%	130%	102%	90%	110%			
Strontium	8582766	8582766	51	45	14.2%	< 1	104%	70%	130%	103%	90%	110%			
Thallium	8582766	8582766	0.1	0.1	NA	< 0.1	99%	70%	130%	100%	90%	110%			
Tin	8582766	8582766	0.5	0.5	NA	< 0.2	94%	70%	130%	98%	90%	110%			
Titanium	8592938		131	97	30.0%	< 1	118%	70%	130%	105%	90%	110%			
Uranium	8582766	8582766	1.1	0.9	NA	< 0.2	90%	70%	130%	92%	90%	110%			
Vanadium	8582766	8582766	28	26	6.7%	< 1	103%	70%	130%	106%	90%	110%			
Zinc	8582766	8582766	88	84	3.9%	< 1	108%	70%	130%	104%	90%	110%			
Zirconium	8582766	8582766	2.1	1.8	16.1%	< 0.1	94%	70%	130%	102%	90%	110%			
pH 1:2	8592938		5.82	5.78	0.7%		100%	90%	110%	100%	95%	105%			

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Soil Salinity - Na & Cl															
Chloride, Soluble	8590359	IH20161	1330	1440	7.9%	< 2	90%	80%	120%	114%	85%	115%			
Sodium, Soluble	1859035	IH20161	119	109	8.8%	< 2	102%	80%	120%	103%	85%	115%			
Saturation Percentage	8590359	IH20161	39.6	41.3	4.2%		99%	80%	120%						

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Soil Salinity - Na & Cl															
Chloride, Soluble	8588489	IH20171	263	285	8.0%	< 2	110%	80%	120%	97%	85%	115%			

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
AGAT WORK ORDER: 17N240971
PROJECT: 1657709.5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

Soil Analysis (Continued)

RPT Date: Aug 24, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Sodium, Soluble	8588489	IH20171	282	263	7.0%	< 2	95%	80%	120%	105%	85%	115%			
Saturation Percentage	8588489	IH20171	3980	4010	0.8%		101%	80%	120%						

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Soil Analysis - (SWEP) - NO2,NO3,Cyanide, Fluoride															
Fluoride - Leachate (SWEP)	8650585		<0.5	<0.5	NA	< 0.5	103%	80%	120%				107%	80%	120%
Nitrate - Leachate (SWEP)	8650585		<0.5	<0.5	NA	< 0.5	102%	80%	120%				100%	80%	120%
Nitrite - Leachate (SWEP)	8650585		<0.5	<0.5	NA	< 0.5	99%	80%	120%				97%	80%	120%
Cyanide - Leachate (SWEP)	8654164		<0.002	<0.002	NA	< 0.002	114%	80%	120%	100%	80%	120%	105%	80%	120%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

(SWEP) Metals															
Arsenic - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	86%	80%	120%	115%	80%	120%	108%	80%	120%
Barium - Leachate (SWEP)	8738785		1.0	1.1	NA	< 0.5	92%	80%	120%	111%	80%	120%	NA	80%	120%
Boron - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	77%	80%	120%	101%	80%	120%	NA	80%	120%
Cadmium - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	91%	80%	120%	104%	80%	120%	103%	80%	120%
Chromium - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	92%	80%	120%	106%	80%	120%	104%	80%	120%
Copper - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	92%	80%	120%	108%	80%	120%	108%	80%	120%
Lead - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	91%	80%	120%	101%	80%	120%	100%	80%	120%
Mercury - Leachate (SWEP)	8738785		<0.1	<0.1	NA	< 0.1	96%	80%	120%	97%	80%	120%	108%	80%	120%
Selenium - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	84%	80%	120%	118%	80%	120%	109%	80%	120%
Silver - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	89%	80%	120%	93%	80%	120%	93%	80%	120%
Uranium - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	92%	80%	120%	97%	80%	120%	98%	80%	120%
Zinc - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	92%	80%	120%	109%	80%	120%	106%	80%	120%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.
With multi element scans it is acceptable for a maximum of 10% (including non-reported elements) of each QC criteria to fail to an absolute maximum of 10%.

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Quality Assurance

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AGAT WORK ORDER: 17N240971
PROJECT: 1657709.5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis

RPT Date: Aug 24, 2017

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Glycols Analysis in Water															
Propylene Glycol	108	8585120	<10	<10	NA	< 10	101%	70%	130%	114%	70%	130%	104%	60%	140%
Monoethylene Glycol	108	8585120	<10	<10	NA	< 10	99%	70%	130%	105%	70%	130%	94%	60%	140%
Diethylene Glycol	108	8585120	<5	<5	NA	< 5	99%	70%	130%	110%	70%	130%	99%	60%	140%
Triethylene Glycol	108	8585120	<10	<10	NA	< 10	96%	70%	130%	108%	70%	130%	95%	60%	140%
Tetraethylene Glycol	108	8585120	<10	<10	NA	< 10	92%	70%	130%	101%	70%	130%	83%	60%	140%

Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

Public Works LEPH/HEPH in Soil Low Level															
Naphthalene	67582	8582704	<0.005	<0.005	NA	< 0.005	100%	80%	120%				91%	50%	130%
2-Methylnaphthalene	67582	8582704	<0.005	<0.005	NA	< 0.005	100%	80%	120%				86%	50%	130%
1-Methylnaphthalene	67582	8582704	0.062	0.094	41.0%	< 0.005	100%	80%	120%				88%	50%	130%
Acenaphthylene	67582	8582704	<0.005	<0.005	NA	< 0.005	101%	80%	120%				88%	50%	130%
Acenaphthene	67582	8582704	<0.005	<0.005	NA	< 0.005	102%	80%	120%				97%	50%	130%
Fluorene	67582	8582704	<0.02	0.02	NA	< 0.02	100%	80%	120%				90%	50%	130%
Phenanthrene	67582	8582704	0.03	0.03	NA	< 0.02	100%	80%	120%				77%	60%	130%
Anthracene	67582	8582704	<0.004	<0.004	NA	< 0.004	102%	80%	120%				91%	60%	130%
Fluoranthene	67582	8582704	<0.01	<0.01	NA	< 0.01	100%	80%	120%				84%	60%	130%
Pyrene	67582	8582704	<0.01	<0.01	NA	< 0.01	102%	80%	120%				85%	60%	130%
Benzo(a)anthracene	67582	8582704	<0.03	<0.03	NA	< 0.03	100%	80%	120%				80%	60%	130%
Chrysene	67582	8582704	<0.05	<0.05	NA	< 0.05	100%	80%	120%				86%	60%	130%
Benzo(b)fluoranthene	67582	8582704	<0.05	<0.05	NA	< 0.05	97%	80%	120%				85%	60%	130%
Benzo(j)fluoranthene	67582	8582704	<0.05	<0.05	NA	< 0.05	101%	80%	120%				95%	60%	130%
Benzo(k)fluoranthene	67582	8582704	<0.05	<0.05	NA	< 0.05	101%	80%	120%				82%	60%	130%
Benzo(a)pyrene	67582	8582704	<0.03	<0.03	NA	< 0.03	103%	80%	120%				76%	60%	130%
Indeno(1,2,3-c,d)pyrene	67582	8582704	<0.02	<0.02	NA	< 0.02	100%	80%	120%				83%	60%	130%
Dibenzo(a,h)anthracene	67582	8582704	<0.005	<0.005	NA	< 0.005	100%	80%	120%				79%	60%	130%
Benzo(g,h,i)perylene	67582	8582704	<0.05	<0.05	NA	< 0.05	100%	80%	120%				90%	60%	130%
Quinoline	67582	8582704	<0.05	<0.05	NA	< 0.05	100%	80%	120%				111%	50%	130%
IACR CCME (Soil)	67582	8582704	<0.6	<0.6	NA	< 0.6									
B[a]P TPE (Soil)	67582	8582704	<0.05	<0.05	NA	< 0.05									
EPH C10-C19	67582	8582704	124	123	0.8%	< 20	105%	70%	130%				95%	65%	120%
EPH C19-C32	67582	8582704	<20	<20	NA	< 20	103%	70%	130%				95%	80%	120%
Naphthalene - d8	67582	8582704	91	88	3.4%		99%	80%	120%				85%	50%	130%
2-Fluorobiphenyl	67582	8582704	90	86	4.5%		106%	80%	120%				93%	50%	130%
P-Terphenyl - d14	67582	8582704	105	101	3.9%		102%	80%	120%				88%	60%	130%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Public Works LEPH/HEPH Silica Gel in Soil Low Level															
Naphthalene	67580	8582885	<0.005	<0.005	NA	< 0.005	101%	80%	120%				109%	50%	130%
2-Methylnaphthalene	67580	8582885	<0.005	<0.005	NA	< 0.005	98%	80%	120%				94%	50%	130%

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Quality Assurance

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SAMPLING SITE:
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Trace Organics Analysis (Continued)

RPT Date: Aug 24, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
1-Methylnaphthalene	67580	8582885	<0.005	<0.005	NA	< 0.005	100%	80%	120%				95%	50%	130%
Acenaphthylene	67580	8582885	<0.005	<0.005	NA	< 0.005	99%	80%	120%				98%	50%	130%
Acenaphthene	67580	8582885	<0.005	<0.005	NA	< 0.005	100%	80%	120%				111%	50%	130%
Fluorene	67580	8582885	<0.02	<0.02	NA	< 0.02	99%	80%	120%				100%	50%	130%
Phenanthrene	67580	8582885	<0.02	<0.02	NA	< 0.02	101%	80%	120%				86%	60%	130%
Anthracene	67580	8582885	<0.004	<0.004	NA	< 0.004	98%	80%	120%				99%	60%	130%
Fluoranthene	67580	8582885	<0.01	<0.01	NA	< 0.01	100%	80%	120%				95%	60%	130%
Pyrene	67580	8582885	<0.01	0.01	NA	< 0.01	100%	80%	120%				99%	60%	130%
Benzo(a)anthracene	67580	8582885	<0.03	<0.03	NA	< 0.03	100%	80%	120%				93%	60%	130%
Chrysene	67580	8582885	<0.05	<0.05	NA	< 0.05	99%	80%	120%				99%	60%	130%
Benzo(b)fluoranthene	67580	8582885	<0.05	<0.05	NA	< 0.05	102%	80%	120%				83%	60%	130%
Benzo(j)fluoranthene	67580	8582885	<0.05	<0.05	NA	< 0.05	101%	80%	120%				104%	60%	130%
Benzo(k)fluoranthene	67580	8582885	<0.05	<0.05	NA	< 0.05	97%	80%	120%				100%	60%	130%
Benzo(a)pyrene	67580	8582885	<0.03	<0.03	NA	< 0.03	101%	80%	120%				93%	60%	130%
Indeno(1,2,3-c,d)pyrene	67580	8582885	<0.02	<0.02	NA	< 0.02	100%	80%	120%				92%	60%	130%
Dibenzo(a,h)anthracene	67580	8582885	<0.005	<0.005	NA	< 0.005	100%	80%	120%				88%	60%	130%
Benzo(g,h,i)perylene	67580	8582885	<0.05	<0.05	NA	< 0.05	100%	80%	120%				92%	60%	130%
Quinoline	67580	8582885	<0.05	<0.05	NA	< 0.05	100%	80%	120%				117%	50%	130%
IACR CCME (Soil)	67580	8582885	<0.6	<0.6	NA	< 0.6									
B[a]P TPE (Soil)	67580	8582885	<0.05	<0.05	NA	< 0.05									
EPH C10-C19sg	67580	MS1	225	201	11.3%	< 20	105%	70%	130%				100%	65%	120%
EPH C19-C32sg	67580	MS1	360	328	9.3%	< 20	103%	70%	130%				102%	80%	120%
Naphthalene - d8	67580	8582885	92	92	0.0%		99%	80%	120%				92%	50%	130%
2-Fluorobiphenyl	67580	8582885	85	86	1.2%		101%	80%	120%				93%	50%	130%
P-Terphenyl - d14	67580	8582885	105	106	0.9%		100%	80%	120%				89%	60%	130%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Public Works LEPH/HEPH in Soil Low Level

Naphthalene	67580	8582885	<0.005	<0.005	NA	< 0.005	101%	80%	120%				109%	50%	130%
2-Methylnaphthalene	67580	8582885	<0.005	<0.005	NA	< 0.005	98%	80%	120%				94%	50%	130%
1-Methylnaphthalene	67580	8582885	<0.005	<0.005	NA	< 0.005	100%	80%	120%				95%	50%	130%
Acenaphthylene	67580	8582885	<0.005	<0.005	NA	< 0.005	99%	80%	120%				98%	50%	130%
Acenaphthene	67580	8582885	<0.005	<0.005	NA	< 0.005	100%	80%	120%				111%	50%	130%
Fluorene	67580	8582885	<0.02	<0.02	NA	< 0.02	99%	80%	120%				100%	50%	130%
Phenanthrene	67580	8582885	<0.02	<0.02	NA	< 0.02	101%	80%	120%				86%	60%	130%
Anthracene	67580	8582885	<0.004	<0.004	NA	< 0.004	98%	80%	120%				99%	60%	130%
Fluoranthene	67580	8582885	<0.01	<0.01	NA	< 0.01	100%	80%	120%				95%	60%	130%
Pyrene	67580	8582885	<0.01	0.01	NA	< 0.01	100%	80%	120%				99%	60%	130%
Benzo(a)anthracene	67580	8582885	<0.03	<0.03	NA	< 0.03	100%	80%	120%				93%	60%	130%
Chrysene	67580	8582885	<0.05	<0.05	NA	< 0.05	99%	80%	120%				99%	60%	130%

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Trace Organics Analysis (Continued)

RPT Date: Aug 24, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Benzo(b)fluoranthene	67580	8582885	<0.05	<0.05	NA	< 0.05	102%	80%	120%				83%	60%	130%
Benzo(j)fluoranthene	67580	8582885	<0.05	<0.05	NA	< 0.05	101%	80%	120%				104%	60%	130%
Benzo(k)fluoranthene	67580	8582885	<0.05	<0.05	NA	< 0.05	97%	80%	120%				100%	60%	130%
Benzo(a)pyrene	67580	8582885	<0.03	<0.03	NA	< 0.03	101%	80%	120%				93%	60%	130%
Indeno(1,2,3-c,d)pyrene	67580	8582885	<0.02	<0.02	NA	< 0.02	100%	80%	120%				92%	60%	130%
Dibenzo(a,h)anthracene	67580	8582885	<0.005	<0.005	NA	< 0.005	100%	80%	120%				88%	60%	130%
Benzo(g,h,i)perylene	67580	8582885	<0.05	<0.05	NA	< 0.05	100%	80%	120%				92%	60%	130%
Quinoline	67580	8582885	<0.05	<0.05	NA	< 0.05	100%	80%	120%				117%	50%	130%
IACR CCME (Soil)	67580	8582885	<0.6	<0.6	NA	< 0.6									
B[a]P TPE (Soil)	67580	8582885	<0.05	<0.05	NA	< 0.05									
EPH C10-C19	67580	8582885	62	70	NA	< 20	105%	70%	130%				89%	65%	120%
EPH C19-C32	67580	8582885	441	488	10.1%	< 20	103%	70%	130%				86%	80%	120%
Naphthalene - d8	67580	8582885	92	92	0.0%		99%	80%	120%				92%	50%	130%
2-Fluorobiphenyl	67580	8582885	85	86	1.2%		101%	80%	120%				93%	50%	130%
P-Terphenyl - d14	67580	8582885	105	106	0.9%		100%	80%	120%				89%	60%	130%
Volatile Organic Compounds in Soil															
Chloromethane	67562	8582689	<0.05	<0.05	NA	< 0.05	96%	80%	120%				110%	60%	140%
Vinyl Chloride	67562	8582689	<0.05	<0.05	NA	< 0.05	97%	80%	120%				84%	60%	140%
Bromomethane	67562	8582689	<0.05	<0.05	NA	< 0.05	98%	80%	120%				119%	60%	140%
Chloroethane	67562	8582689	<0.05	<0.05	NA	< 0.05	98%	80%	120%				92%	60%	140%
Trichlorofluoromethane	67562	8582689	<0.05	<0.05	NA	< 0.05	98%	80%	120%				87%	70%	130%
Acetone	67562	8582689	<0.5	<0.5	NA	< 0.5	98%	80%	120%				87%	70%	130%
1,1-Dichloroethene	67562	8582689	<0.05	<0.05	NA	< 0.05	98%	80%	120%				93%	70%	130%
Dichloromethane	67562	8582689	<0.05	<0.05	NA	< 0.05	99%	80%	120%				90%	70%	130%
Methyl tert-butyl ether (MTBE)	67562	8582689	<0.1	<0.1	NA	< 0.1	98%	80%	120%				94%	70%	130%
2-Butanone (MEK)	67562	8582689	<0.5	<0.5	NA	< 0.5	99%	80%	120%				96%	70%	130%
trans-1,2-Dichloroethene	67562	8582689	<0.05	<0.05	NA	< 0.05	98%	80%	120%				93%	70%	130%
1,1-Dichloroethane	67562	8582689	<0.05	<0.05	NA	< 0.05	95%	80%	120%				86%	70%	130%
cis-1,2-Dichloroethene	67562	8582689	<0.05	<0.05	NA	< 0.05	99%	80%	120%				92%	70%	130%
Chloroform	67562	8582689	<0.05	<0.05	NA	< 0.05	99%	80%	120%				92%	70%	130%
1,2-Dichloroethane	67562	8582689	<0.05	<0.05	NA	< 0.05	99%	80%	120%				89%	70%	130%
1,1,1-Trichloroethane	67562	8582689	<0.05	<0.05	NA	< 0.05	99%	80%	120%				89%	70%	130%
Carbon Tetrachloride	67562	8582689	<0.02	<0.02	NA	< 0.02	100%	80%	120%				86%	70%	130%
Benzene	67562	8582689	<0.02	<0.02	NA	< 0.02	99%	80%	120%				93%	70%	130%
1,2-Dichloropropane	67562	8582689	<0.05	<0.05	NA	< 0.05	99%	80%	120%				92%	70%	130%
Trichloroethene	67562	8582689	<0.01	<0.01	NA	< 0.01	99%	80%	120%				96%	70%	130%
Bromodichloromethane	67562	8582689	<0.05	<0.05	NA	< 0.05	100%	80%	120%				88%	70%	130%
trans-1,3-Dichloropropene	67562	8582689	<0.05	<0.05	NA	< 0.05	101%	80%	120%				85%	60%	140%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
AGAT WORK ORDER: 17N240971
PROJECT: 1657709.5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Aug 24, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
4-Methyl-2-pentanone (MIBK)	67562	8582689	<0.5	<0.5	NA	< 0.5	101%	80%	120%				81%	70%	130%
cis-1,3-Dichloropropene	67562	8582689	<0.05	<0.05	NA	< 0.05	101%	80%	120%				87%	60%	140%
1,1,2-Trichloroethane	67562	8582689	<0.05	<0.05	NA	< 0.05	99%	80%	120%				88%	70%	130%
Toluene	67562	8582689	<0.05	<0.05	NA	< 0.05	99%	80%	120%				93%	70%	130%
Dibromochloromethane	67562	8582689	<0.05	<0.05	NA	< 0.05	101%	80%	120%				86%	70%	130%
Ethylene Dibromide	67562	8582689	<0.05	<0.05	NA	< 0.05	100%	80%	120%				90%	70%	130%
Tetrachloroethene	67562	8582689	<0.05	<0.05	NA	< 0.05	99%	80%	120%				86%	70%	130%
1,1,1,2-Tetrachloroethane	67562	8582689	<0.05	<0.05	NA	< 0.05	100%	80%	120%				89%	70%	130%
Chlorobenzene	67562	8582689	<0.05	<0.05	NA	< 0.05	99%	80%	120%				94%	70%	130%
Ethylbenzene	67562	8582689	<0.05	<0.05	NA	< 0.05	100%	80%	120%				93%	70%	130%
m&p-Xylene	67562	8582689	<0.05	<0.05	NA	< 0.05	99%	80%	120%				91%	70%	130%
Bromoform	67562	8582689	<0.05	<0.05	NA	< 0.05	102%	80%	120%				79%	70%	130%
Styrene	67562	8582689	<0.05	<0.05	NA	< 0.05	101%	80%	120%				90%	70%	130%
1,1,2,2-Tetrachloroethane	67562	8582689	<0.05	<0.05	NA	< 0.05	100%	80%	120%				89%	70%	130%
o-Xylene	67562	8582689	<0.05	<0.05	NA	< 0.05	99%	80%	120%				92%	70%	130%
1,3-Dichlorobenzene	67562	8582689	<0.05	<0.05	NA	< 0.05	99%	80%	120%				94%	70%	130%
1,4-Dichlorobenzene	67562	8582689	<0.05	<0.05	NA	< 0.05	99%	80%	120%				93%	70%	130%
1,2-Dichlorobenzene	67562	8582689	<0.05	<0.05	NA	< 0.05	100%	80%	120%				96%	70%	130%
1,2,4-Trichlorobenzene	67562	8582689	<0.05	<0.05	NA	< 0.05	101%	80%	120%				97%	70%	130%
Bromofluorobenzene	67562	8582689	94	98	4.2%		118%	60%	140%				106%	60%	140%
Dibromofluoromethane	67562	8582689	96	99	3.1%		101%	60%	140%				99%	60%	140%
Toluene - d8	67562	8582689	110	114	3.6%		105%	60%	140%				107%	60%	140%
VH	67562	8582689	<10	<10	NA	< 10									
VPH	67562	8582689	<10	<10	NA	< 10									

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

BTEX / VPH (C6-C10) Soil															
Methyl tert-butyl ether (MTBE)	67575	8582692	<0.1	<0.1	NA	< 0.1	94%	80%	120%				115%	70%	130%
Benzene	67575	8582692	<0.02	<0.02	NA	< 0.02	99%	80%	120%				88%	70%	130%
Toluene	67575	8582692	<0.05	<0.05	NA	< 0.05	104%	80%	120%				102%	70%	130%
Ethylbenzene	67575	8582692	<0.05	<0.05	NA	< 0.05	99%	80%	120%				97%	70%	130%
m&p-Xylene	67575	8582692	<0.05	<0.05	NA	< 0.05	99%	80%	120%				96%	70%	130%
o-Xylene	67575	8582692	<0.05	<0.05	NA	< 0.05	101%	80%	120%				90%	70%	130%
Styrene	67575	8582692	<0.05	<0.05	NA	< 0.05	101%	80%	120%				93%	70%	130%
VPH	67575	8582692	<10	<10	NA	< 10									
VH	67575	8582692	<10	<10	NA	< 10									
Bromofluorobenzene	67575	8582692	98	102	4.0%		109%	60%	140%				97%	60%	140%
Dibromofluoromethane	67575	8582692	93	94	1.1%		97%	60%	140%				87%	60%	140%
Toluene - d8	67575	8582692	101	104	2.9%		108%	60%	140%				103%	60%	140%

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Quality Assurance

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Trace Organics Analysis (Continued)

RPT Date: Aug 24, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
BTEX / VPH (C6-C10) Soil															
Methyl tert-butyl ether (MTBE)	67576	8591675	<0.1	<0.1	NA	< 0.1	95%	80%	120%				80%	70%	130%
Benzene	67576	8591675	<0.02	<0.02	NA	< 0.02	101%	80%	120%				94%	70%	130%
Toluene	67576	8591675	<0.05	<0.05	NA	< 0.05	100%	80%	120%				98%	70%	130%
Ethylbenzene	67576	8591675	<0.05	<0.05	NA	< 0.05	100%	80%	120%				96%	70%	130%
m&p-Xylene	67576	8591675	<0.05	<0.05	NA	< 0.05	100%	80%	120%				94%	70%	130%
o-Xylene	67576	8591675	<0.05	<0.05	NA	< 0.05	100%	80%	120%				96%	70%	130%
Styrene	67576	8591675	<0.05	<0.05	NA	< 0.05	100%	80%	120%				96%	70%	130%
VPH	67576	8591675	<10	<10	NA	< 10									
VH	67576	8591675	<10	<10	NA	< 10									
Bromofluorobenzene	67576	8591675	86	87	1.2%		100%	60%	140%				87%	60%	140%
Dibromofluoromethane	67576	8591675	96	97	1.0%		103%	60%	140%				91%	60%	140%
Toluene - d8	67576	8591675	96	98	2.1%		100%	60%	140%				94%	60%	140%
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
Public Works LEPH/HEPH in Water Low Level															
Naphthalene	67600	W-MS3	0.45	0.45	0.0%	< 0.05	102%	80%	120%				91%	50%	130%
Quinoline	67600	W-MS3	0.6	0.6	0.0%	< 0.1	99%	80%	120%				130%	50%	130%
Acenaphthylene	67600	W-MS3	0.43	0.41	4.8%	< 0.02	100%	80%	120%				88%	50%	130%
Acenaphthene	67600	W-MS3	0.50	0.48	4.1%	< 0.02	102%	80%	120%				100%	50%	130%
Fluorene	67600	W-MS3	0.46	0.44	4.4%	< 0.02	101%	80%	120%				93%	50%	130%
Phenanthrene	67600	W-MS3	0.42	0.42	0.0%	< 0.04	100%	80%	120%				85%	60%	130%
Anthracene	67600	W-MS3	0.46	0.46	0.0%	< 0.01	100%	80%	120%				93%	60%	130%
Acridine	67600	W-MS3	0.57	0.64	11.6%	< 0.05	99%	80%	120%				114%	50%	130%
Fluoranthene	67600	W-MS3	0.46	0.45	2.2%	< 0.02	99%	80%	120%				92%	60%	130%
Pyrene	67600	W-MS3	0.47	0.47	0.0%	< 0.02	100%	80%	120%				96%	60%	130%
Benzo(a)anthracene	67600	W-MS3	0.42	0.41	2.4%	< 0.01	102%	80%	120%				85%	60%	130%
Chrysene	67600	W-MS3	0.48	0.47	2.1%	< 0.01	102%	80%	120%				98%	60%	130%
Benzo(b)fluoranthene	67600	W-MS3	0.39	0.40	2.5%	< 0.01	106%	80%	120%				79%	60%	130%
Benzo(j)fluoranthene	67600	W-MS3	0.54	0.51	5.7%	< 0.01	103%	80%	120%				109%	60%	130%
Benzo(k)fluoranthene	67600	W-MS3	0.47	0.42	11.2%	< 0.01	94%	80%	120%				94%	60%	130%
Benzo(a)pyrene	67600	W-MS3	0.45	0.41	9.3%	< 0.01	100%	80%	120%				92%	60%	130%
Indeno(1,2,3-c,d)pyrene	67600	W-MS3	0.44	0.40	9.5%	< 0.01	101%	80%	120%				89%	60%	130%
Dibenzo(a,h)anthracene	67600	W-MS3	0.41	0.39	5.0%	< 0.01	100%	80%	120%				84%	60%	130%
Benzo(g,h,i)perylene	67600	W-MS3	0.47	0.42	11.2%	< 0.01	101%	80%	120%				94%	60%	130%
1-Methylnaphthalene	67600	W-MS3	0.42	0.42	0.0%	< 0.05	99%	80%	120%				84%	50%	130%
2-Methylnaphthalene	67600	W-MS3	0.41	0.41	0.0%	< 0.05	102%	80%	120%				83%	50%	130%
EPH C10-C19	67600	W-MS1	9150	9390	2.6%	< 100	104%	70%	130%				87%	70%	130%

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Quality Assurance

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AGAT WORK ORDER: 17N240971
PROJECT: 1657709.5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Aug 24, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
EPH C19-C32	67600	W-MS1	15200	15500	2.0%	< 100	99%	70%	130%				90%	70%	130%
Naphthalene - d8	67600	W-MS3	78	74	5.3%		103%	80%	120%				79%	50%	130%
2-Fluorobiphenyl	67600	W-MS3	80	76	5.1%		104%	80%	120%				81%	50%	130%
P-Terphenyl - d14	67600	W-MS3	79	78	1.3%		99%	80%	120%				79%	60%	130%
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
CCME BTEX/F1-F4 (Water)															
Methyl tert-butyl ether (MTBE)	67589	8586638	<1	<1	NA	< 1	94%	80%	120%				98%	70%	130%
Benzene	67589	8586638	1.0	1.0	NA	< 0.5	99%	80%	120%				99%	70%	130%
Ethylbenzene	67589	8586638	0.8	0.8	NA	< 0.5	99%	80%	120%				103%	70%	130%
Toluene	67589	8586638	<0.5	<0.5	NA	< 0.5	104%	80%	120%				91%	70%	130%
m&p-Xylene	67589	8586638	0.8	0.8	NA	< 0.5	99%	80%	120%				101%	70%	130%
o-Xylene	67589	8586638	<0.5	<0.5	NA	< 0.5	101%	80%	120%				98%	70%	130%
Styrene	67589	8586638	<0.5	<0.5	NA	< 0.5	101%	80%	120%				104%	70%	130%
F1 (C6-C10)	67589	8586638	<100	<100	NA	< 100									
F1 minus BTEX (C6-C10)	67589	8586638	<100	<100	NA	< 100									
F2 (C10-C16)	67600	W-MS1	6250	6250	0.0%	< 100	100%	80%	120%				86%	70%	130%
F3 (C16-C34)	67600	W-MS1	20700	20700	0.0%	< 100	108%	80%	120%				91%	70%	130%
F4 (C34-C50)	67600	W-MS1	4630	4630	0.0%	< 100	98%	80%	120%				87%	70%	130%
Bromofluorobenzene	67589	8586638	85	99	15.2%		109%	70%	130%				108%	70%	130%
Dibromofluoromethane	67589	8586638	102	102	0.0%		97%	70%	130%				105%	70%	130%
Toluene - d8	67589	8586638	99	101	2.0%		108%	70%	130%				95%	70%	130%
VH	67589	8586638	<100	<100	NA	< 100									
VPH	67589	8586638	<100	<100	NA	< 100									
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
BTEX / VPH (C6-C10) Water															
Methyl tert-butyl ether (MTBE)	67590	8582931	<1	<1	NA	< 1	94%	80%	120%				98%	70%	130%
Benzene	67590	8582931	<0.5	<0.5	NA	< 0.5	99%	80%	120%				99%	70%	130%
Toluene	67590	8582931	<0.5	<0.5	NA	< 0.5	104%	80%	120%				91%	70%	130%
Ethylbenzene	67590	8582931	<0.5	<0.5	NA	< 0.5	99%	80%	120%				103%	70%	130%
m&p-Xylene	67590	8582931	<0.5	<0.5	NA	< 0.5	99%	80%	120%				101%	70%	130%
o-Xylene	67590	8582931	<0.5	<0.5	NA	< 0.5	101%	80%	120%				98%	70%	130%
Styrene	67590	8582931	<0.5	<0.5	NA	< 0.5	101%	80%	120%				104%	70%	130%
VPH	67590	8582931	<100	<100	NA	< 100									
VH	67590	8582931	<100	<100	NA	< 100									
Bromofluorobenzene	67590	8582931	110	107	2.8%		109%	70%	130%				108%	70%	130%
Dibromofluoromethane	67590	8582931	106	97	8.9%		97%	70%	130%				105%	70%	130%
Toluene - d8	67590	8582931	95	97	2.1%		108%	70%	130%				95%	70%	130%

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Trace Organics Analysis (Continued)

RPT Date: Aug 24, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
Volatile Organic Compounds in Water															
Chloromethane	67589	8582904	<1	<1	NA	< 1	96%	80%	120%				108%	70%	130%
Vinyl Chloride	67589	8582904	<1	<1	NA	< 1	97%	80%	120%				100%	70%	130%
Bromomethane	67589	8582904	<1	<1	NA	< 1	98%	80%	120%				97%	70%	130%
Chloroethane	67589	8582904	<1	<1	NA	< 1	98%	80%	120%				106%	70%	130%
Trichlorofluoromethane	67589	8582904	<1	<1	NA	< 1	98%	80%	120%				108%	70%	130%
Acetone	67589	8582904	<10	<10	NA	< 10	98%	80%	120%						
1,1-Dichloroethene	67589	8582904	<1	<1	NA	< 1	98%	80%	120%				116%	70%	130%
Dichloromethane	67589	8582904	<1	<1	NA	< 1	99%	80%	120%				96%	70%	130%
Methyl tert-butyl ether (MTBE)	67589	8582904	<1	<1	NA	< 1	98%	80%	120%				106%	70%	130%
2-Butanone (MEK)	67589	8582904	<10	<10	NA	< 10	99%	80%	120%						
trans-1,2-Dichloroethylene	67589	8582904	<1	<1	NA	< 1	98%	80%	120%				107%	70%	130%
1,1-Dichloroethane	67589	8582904	<1	<1	NA	< 1	95%	80%	120%				102%	70%	130%
cis-1,2-Dichloroethylene	67589	8582904	<1	<1	NA	< 1	99%	80%	120%				99%	70%	130%
Chloroform	67589	8582904	<1	<1	NA	< 1	99%	80%	120%				101%	70%	130%
1,2-Dichloroethane	67589	8582904	<1	<1	NA	< 1	99%	80%	120%				100%	70%	130%
1,1,1-Trichloroethane	67589	8582904	<1	<1	NA	< 1	99%	80%	120%				102%	70%	130%
Carbon Tetrachloride	67589	8582904	<0.5	<0.5	NA	< 0.5	100%	80%	120%				103%	70%	130%
Benzene	67589	8582904	<0.5	<0.5	NA	< 0.5	99%	80%	120%				101%	70%	130%
1,2-Dichloropropane	67589	8582904	<1	<1	NA	< 1	99%	80%	120%				101%	70%	130%
Trichloroethene	67589	8582904	<1	<1	NA	< 1	99%	80%	120%				102%	70%	130%
Bromodichloromethane	67589	8582904	<1	<1	NA	< 1	100%	80%	120%				98%	70%	130%
trans-1,3-Dichloropropene	67589	8582904	<1	<1	NA	< 1	101%	80%	120%				98%	70%	130%
4-Methyl-2-pentanone (MIBK)	67589	8582904	<10	<10	NA	< 10	101%	80%	120%						
cis-1,3-Dichloropropene	67589	8582904	<1	<1	NA	< 1	101%	80%	120%				97%	70%	130%
1,1,2-Trichloroethane	67589	8582904	<1	<1	NA	< 1	99%	80%	120%				95%	70%	130%
Toluene	67589	8582904	<0.5	<0.5	NA	< 0.5	99%	80%	120%				100%	70%	130%
Dibromochloromethane	67589	8582904	<1	<1	NA	< 1	101%	80%	120%				95%	70%	130%
Ethylene Dibromide	67589	8582904	<0.3	<0.3	NA	< 0.3	100%	80%	120%				98%	70%	130%
Tetrachloroethene	67589	8582904	<1	<1	NA	< 1	99%	80%	120%				80%	70%	130%
1,1,1,2-Tetrachloroethane	67589	8582904	<1	<1	NA	< 1	100%	80%	120%				96%	70%	130%
Chlorobenzene	67589	8582904	<1	<1	NA	< 1	99%	80%	120%				98%	70%	130%
Ethylbenzene	67589	8582904	<0.5	<0.5	NA	< 0.5	100%	80%	120%				102%	70%	130%
m&p-Xylene	67589	8582904	<0.5	<0.5	NA	< 0.5	99%	80%	120%				100%	70%	130%
Bromoform	67589	8582904	<1	<1	NA	< 1	102%	80%	120%				95%	70%	130%
Styrene	67589	8582904	<0.5	<0.5	NA	< 0.5	101%	80%	120%				98%	70%	130%
1,1,2,2-Tetrachloroethane	67589	8582904	<1	<1	NA	< 1	100%	80%	120%				94%	70%	130%
o-Xylene	67589	8582904	<0.5	<0.5	NA	< 0.5	99%	80%	120%				100%	70%	130%

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Aug 24, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
1,3-Dichlorobenzene	67589	8582904	<0.5	<0.5	NA	< 0.5	99%	80%	120%				100%	70%	130%
1,4-Dichlorobenzene	67589	8582904	<0.5	<0.5	NA	< 0.5	99%	80%	120%				100%	70%	130%
1,2-Dichlorobenzene	67589	8582904	<0.5	<0.5	NA	< 0.5	100%	80%	120%				100%	70%	130%
1,2,4-Trichlorobenzene	67589	8582904	<1	<1	NA	< 1	101%	80%	120%				104%	70%	130%
Bromofluorobenzene	67589	8582904	87	84	3.5%		118%	70%	130%				93%	70%	130%
Dibromofluoromethane	67589	8582904	87	85	2.3%		101%	70%	130%				81%	70%	130%
Toluene - d8	67589	8582904	103	99	4.0%		105%	70%	130%				84%	70%	130%
VH	67589	8582904	<100	<100	NA	< 100									
VPH	67589	8582904	<100	<100	NA	< 100									

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Certified By:

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AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Water Analysis

RPT Date: Aug 24, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Public Works Dissolved Metals															
Aluminum Dissolved	8594129		306	310	1.0%	< 2	91%	90%	110%	98%	90%	110%			
Antimony Dissolved	8594129		<0.2	<0.2	NA	< 0.2	93%	90%	110%	95%	90%	110%			
Arsenic Dissolved	8594129		0.2	<0.1	NA	< 0.1	102%	90%	110%	103%	90%	110%			
Barium Dissolved	8594129		19.7	21.9	10.8%	< 0.2	97%	90%	110%	107%	90%	110%			
Beryllium Dissolved	8594129		0.02	0.03	NA	< 0.01	100%	90%	110%	100%	90%	110%			
Bismuth Dissolved	8594129		<0.05	<0.05	NA	< 0.05				103%	90%	110%			
Boron Dissolved	8594129		<2	<2	NA	< 2	93%	90%	110%	103%	90%	110%			
Cadmium Dissolved	8594129		<0.01	0.01	NA	< 0.01	108%	90%	110%	96%	90%	110%			
Calcium Dissolved	8594129		6950	6890	0.9%	< 50	103%	90%	110%	99%	90%	110%			
Chromium Dissolved	8594129		<0.5	<0.5	NA	< 0.5	103%	90%	110%	102%	90%	110%			
Cobalt Dissolved	8594129		0.29	0.28	3.8%	< 0.05	96%	90%	110%	96%	90%	110%			
Copper Dissolved	8594129		0.7	0.6	NA	< 0.2	101%	90%	110%	103%	90%	110%			
Iron Dissolved	8594129		772	752	2.6%	< 10	102%	90%	110%	100%	90%	110%			
Lead Dissolved	8594129		0.13	0.12	NA	< 0.05	100%	90%	110%	98%	90%	110%			
Lithium Dissolved	8594129		<0.5	<0.5	NA	< 0.5				104%	90%	110%			
Magnesium Dissolved	8594129		702	693	1.4%	< 50	103%	90%	110%	103%	90%	110%			
Manganese Dissolved	8594129		82	81	0.7%	< 1	104%	90%	110%	105%	90%	110%			
Mercury Dissolved	8582904	8582904	0.01	0.01	NA	< 0.01	91%	90%	110%	98%	90%	110%			
Molybdenum Dissolved	8594129		0.15	0.15	NA	< 0.05	100%	90%	110%	103%	90%	110%			
Nickel Dissolved	8594129		0.5	0.4	NA	< 0.2	99%	90%	110%	101%	90%	110%			
Potassium Dissolved	8594129		420	445	5.9%	< 50	98%	90%	110%	99%	90%	110%			
Selenium Dissolved	8594129		<0.5	<0.5	NA	< 0.5	95%	90%	110%	98%	90%	110%			
Silicon Dissolved	8594129		2370	2370	0.0%	< 50				105%	90%	110%			
Silver Dissolved	8594129		<0.02	<0.02	NA	< 0.02				94%	90%	110%			
Sodium Dissolved	8594129		12600	12400	1.7%	< 50	101%	90%	110%	102%	90%	110%			
Strontium Dissolved	8594129		35.2	36.4	3.5%	< 0.1	99%	90%	110%	93%	90%	110%			
Sulphur Dissolved	8594129		2360	2290	NA	< 500				92%	90%	110%			
Thallium Dissolved	8594129		0.02	0.01	NA	< 0.01	95%	90%	110%	99%	90%	110%			
Tin Dissolved	8594129		<0.05	<0.05	NA	< 0.05				95%	90%	110%			
Titanium Dissolved	8594129		1.7	1.7	NA	< 0.5				100%	90%	110%			
Uranium Dissolved	8594129		<0.01	<0.01	NA	< 0.01	94%	90%	110%	98%	90%	110%			
Vanadium Dissolved	8594129		1.2	1.3	NA	< 0.5	106%	90%	110%	102%	90%	110%			
Zinc Dissolved	8594129		7	6	NA	< 2	101%	90%	110%	101%	90%	110%			
Zirconium Dissolved	8594129		0.1	0.1	NA	< 0.1	91%	90%	110%	94%	70%	130%			
Chloride in Water															
Chloride	8582931	8582931	<0.05	<0.05	NA	< 0.05	103%	90%	110%	98%	90%	110%			

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date: Aug 24, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
British Columbia CSR - Schedule 6 Total Metals															
Aluminum Total	8594129		453	481	5.9%	< 5	102%	85%	115%	92%	90%	110%			
Antimony Total	8594129		<0.5	<0.5	NA	< 0.5	112%	85%	115%	93%	90%	110%			
Arsenic Total	8594129		0.2	0.1	NA	< 0.1	98%	85%	115%	100%	90%	110%			
Barium Total	8594129		23.4	24.3	3.7%	< 0.5	115%	85%	115%	103%	90%	110%			
Beryllium Total	8594129		<0.05	<0.05	NA	< 0.05	103%	85%	115%	100%	90%	110%			
Boron Total	8594129		<5	<5	NA	< 5	103%	85%	115%	101%	90%	110%			
Cadmium Total	8594129		<0.01	<0.01	NA	< 0.01	96%	85%	115%	100%	90%	110%			
Calcium Total	8594129		6900	6850	0.8%	< 50	103%	85%	115%	101%	90%	110%			
Chromium Total	8594129		<0.5	<0.5	NA	< 0.5	104%	85%	115%	104%	90%	110%			
Cobalt Total	8594129		0.29	0.33	11.0%	< 0.05	107%	85%	115%	100%	90%	110%			
Copper Total	8594129		1.1	1.2	NA	< 0.5	106%	85%	115%	105%	90%	110%			
Iron Total	8594129		1070	1070	0.6%	< 10	106%	85%	115%	101%	90%	110%			
Lead Total	8594129		0.24	0.25	NA	< 0.05	110%	85%	115%	96%	90%	110%			
Lithium Total	8594129		<0.5	<0.5	NA	< 0.5				102%	90%	110%			
Magnesium Total	8594129		702	693	1.4%	< 50	102%	85%	115%	101%	90%	110%			
Manganese Total	8594129		82	81	0.9%	< 1	106%	85%	115%	102%	90%	110%			
Mercury Total	8593895		<0.01	<0.01	NA	< 0.01	93%	85%	115%	97%	90%	110%			
Molybdenum Total	8594129		0.1	0.2	NA	< 0.1		85%	115%	103%	90%	110%			
Nickel Total	8594129		<0.5	<0.5	NA	< 0.5	108%	85%	115%	101%	90%	110%			
Potassium Total	8594129		391	380	NA	< 100	97%	85%	115%	102%	90%	110%			
Selenium Total	8594129		<0.5	<0.5	NA	< 0.5	98%	85%	115%	105%	90%	110%			
Silver Total	8594129		<0.02	<0.02	NA	< 0.02				99%	90%	110%			
Sodium Total	8594129		10800	10700	0.9%	< 100	101%	85%	115%	101%	90%	110%			
Thallium Total	8594129		0.03	0.02	NA	< 0.02	115%	85%	115%	100%	90%	110%			
Titanium Total	8594129		3	3	NA	< 1				101%	90%	110%			
Uranium Total	8594129		0.01	<0.01	NA	< 0.01	109%	85%	115%	96%	90%	110%			
Vanadium Total	8594129		2	2	NA	< 1	110%	85%	115%	105%	90%	110%			
Zinc Total	8594129		8	8	NA	< 5	102%	85%	115%	103%	90%	110%			

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Certified By:

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QA Violation

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

ATTENTION TO: Erin O'Brien

RPT Date: Aug 24, 2017

PARAMETER	Sample Id	Sample Description	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
				Lower	Upper		Lower	Upper		Lower	Upper
(SWEP) Metals											
Boron - Leachate (SWEP)		03826-04	77%	80%	120%	101%	80%	120%	NA	80%	120%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.
With multi element scans it is acceptable for a maximum of 10% (including non-reported elements) of each QC criteria to fail to an absolute maximum of 10%.

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Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
AGAT WORK ORDER: 17N240971
PROJECT: 1657709.5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Arsenic - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Barium - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Boron - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Cadmium - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Chromium - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Copper - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Lead - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Mercury - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Selenium - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Silver - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Uranium - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Zinc - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Aluminum	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Antimony	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Arsenic	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Barium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Beryllium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Bismuth	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Cadmium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Calcium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Chromium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Cobalt	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Copper	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Iron	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Lead	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Lithium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Magnesium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Manganese	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP-MS
Mercury	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Molybdenum	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Nickel	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Phosphorus	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Potassium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES

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Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Selenium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Silver	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Sodium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Strontium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP-MS
Thallium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Tin	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Titanium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Uranium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Vanadium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Zinc	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Zirconium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
pH 1:2	INOR-181-6031	BC MOE Lab Manual B (pH, Electrometric, Soil)	PH METER
Fluoride - Leachate (SWEP)	INST 0425	EPA SW 846-1311 BC SW	IC
Nitrate - Leachate (SWEP)	INST 0425	EPA SW 846-1311 BC SW	IC
Nitrite - Leachate (SWEP)	INST 0425	EPA SW 846-1311 BC SW	IC
Cyanide - Leachate (SWEP)	SOIL 0420; INST 0310	BC Laboratory Manual 2013	CONTINUOUS FLOW ANALYZER
Chloride, Soluble	LAB-181-4022, INOR-181-6023	BC MOE Lab Manual Section B	COLORIMETER
Sodium, Soluble	LAB-181-4022, MET-181-6106	BC MOE Lab Manual Section B	ICP/OES
Saturation Percentage	LAB-181-4022	BC MOE Lab Manual Section B	GRAVIMETRIC

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Naphthalene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
2-Methylnaphthalene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
1-Methylnaphthalene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthylene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluorene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Phenanthrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Chrysene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(b)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(j)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(k)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Indeno(1,2,3-c,d)pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Dibenzo(a,h)anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(g,h,i)perylene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Quinoline	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
IACR CCME (Soil)	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
B[a]P TPE (Soil)	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
EPH C10-C19sg	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
EPH C19-C32sg	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
LEPH C10-C19sg	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
HEPH C19-C32sg	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
Naphthalene - d8	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS

AGAT Laboratories

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Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
2-Fluorobiphenyl	ORG-180-5102	Modified form BCMOE Lab Manual Section D (PAH)	GC/MS
P-Terphenyl - d14	ORG-180-5102	Modified form BCMOE Lab Manual Section D (PAH)	GC/MS
EPH C10-C19	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
EPH C19-C32	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
LEPH C10-C19	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
HEPH C19-C32	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
Methyl tert-butyl ether (MTBE)	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Benzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Toluene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Ethylbenzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
m&p-Xylene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
o-Xylene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Styrene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
VPH	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
VH	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Bromofluorobenzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Dibromofluoromethane	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Toluene - d8	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
Benzene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
Toluene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
Ethylbenzene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
m&p-Xylene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
o-Xylene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
Styrene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
VPH	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
VH	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
Bromofluorobenzene	ORG-180-5130	modified from BC MOE Lab Manual Section D	GC/MS

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Dibromofluoromethane	ORG-180-5130	modified from BC MOE Lab Manual Section D	GC/MS
Toluene - d8	ORG-180-5130	modified from BC MOE Lab Manual Section D	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5130	EPA SW-846 8260	GC/MS/FID
Benzene	ORG-180-5130	EPA SW-846 8260	GC/MS/FID
Ethylbenzene	ORG-180-5130	EPA SW-846 8260	GC/MS/FID
Toluene	ORG-180-5130	EPA SW-846 8260	GC/MS/FID
m&p-Xylene	ORG-180-5130	EPA SW-846 8260	GC/MS/FID
o-Xylene	ORG-180-5130	EPA SW-846 8260	GC/MS/FID
Styrene	ORG-180-5130	EPA SW-846 8260	GC/MS/FID
F1 (C6-C10)	ORG-180-5130	CCME Tier 1 Method	GC/MS/FID
F1 minus BTEX (C6-C10)	ORG-180-5130	CCME Tier 1 Method	GC/MS/FID
F2 (C10-C16)	ORG-180-5134	CCME Tier 1 Method	GC/FID
F3 (C16-C34)	ORG-180-5134	CCME Tier 1 Method	GC/FID
F4 (C34-C50)	ORG-180-5134	CCME Tier 1 Method	GC/FID
Bromofluorobenzene			GC/MS
Dibromofluoromethane			GC/MS
Toluene - d8			GC/MS
VPH	ORG-180-5130	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Propylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Monoethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Diethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Triethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Tetraethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Heptanol	TO-1410	EPA SW-846 8015	GC/FID
Quinoline	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthylene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluorene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Phenanthrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Anthracene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acridine	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Pyrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)anthracene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Chrysene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(b)fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(j)fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Benzo(k)fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)pyrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Indeno(1,2,3-c,d)pyrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Dibenzo(a,h)anthracene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(g,h,i)perylene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
1-Methylnaphthalene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
2-Methylnaphthalene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
EPH C10-C19	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
EPH C19-C32	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
LEPH C10-C19	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
HEPH C19-C32	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
Naphthalene - d8			GC/MS
2-Fluorobiphenyl	ORG-180-5133	Modified form BCMOE Lab Manual Section D (PAH)	GC/MS
P-Terphenyl - d14	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Chloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Vinyl Chloride	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromomethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichlorofluoromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Acetone	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dichloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
2-Butanone (MEK)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,2-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,2-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroform	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS

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Method Summary

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
1,2-Dichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1-Trichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Carbon Tetrachloride	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Benzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloropropane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromodichloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,3-Dichloropropene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
4-Methyl-2-pentanone (MIBK)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,3-Dichloropropene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2-Trichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromochloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylene Dibromide	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Tetrachloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1,2-Tetrachloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylbenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
m&p-Xylene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromoform	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Styrene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2,2-Tetrachloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
o-Xylene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,3-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,4-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2,4-Trichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromofluorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Dibromofluoromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene - d8	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
VH	ORG-180-5103	Modified from BC MOE Lab Manual Sec D (VOC)	GC/MS/FID
VPH	ORG-180-5103	Modified from BC MOE Lab Manual Sec D (VOC)	GC/MS/FID
Chloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Vinyl Chloride	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromomethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichlorofluoromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Acetone	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dichloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
2-Butanone (MEK)	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,2-Dichloroethylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,2-Dichloroethylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroform	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1-Trichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Carbon Tetrachloride	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Benzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloropropane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichloroethene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromodichloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,3-Dichloropropene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
4-Methyl-2-pentanone (MIBK)	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,3-Dichloropropene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
1,1,2-Trichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromochloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylene Dibromide	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Tetrachloroethene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1,2-Tetrachloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
Chlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylbenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
m&p-Xylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromoform	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Styrene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2,2-Tetrachloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
o-Xylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,3-Dichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,4-Dichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2,4-Trichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromofluorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromofluoromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene - d8	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
VH	ORG-180-5133	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS/FID
VPH	ORG-180-5131	Modified from BC MOE Lab Manual Sec D (VOC)	GC/MS/FID

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Aluminum Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Antimony Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Arsenic Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Barium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Beryllium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Boron Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Cadmium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Calcium Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Chromium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Cobalt Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Copper Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Iron Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Lead Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Lithium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Magnesium Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Manganese Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Mercury Total	MET-181-6103	Modified from EPA 245.7	CV/AA
Molybdenum Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Nickel Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Potassium Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Selenium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Silver Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Sodium Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Thallium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Titanium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Uranium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Vanadium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Zinc Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS

AGAT Laboratories
Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
AGAT WORK ORDER: 17N240971
PROJECT: 1657709.5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Chloride	INOR-181-6002	Modified from SM 4110 B	ION CHROMATOGRAPH
Aluminum Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Antimony Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Arsenic Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Barium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Beryllium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Bismuth Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Boron Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Cadmium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Calcium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Chromium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Cobalt Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Copper Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Iron Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Lead Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Lithium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Magnesium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Manganese Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Mercury Dissolved	MET-181-6103, LAB-181-4015	Modified from EPA 245.7	CV/AA
Molybdenum Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Nickel Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Potassium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Selenium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Silicon Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Silver Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Sodium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Strontium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Sulphur Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N240971

PROJECT: 1657709.5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Thallium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Tin Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Titanium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Uranium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Vanadium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Zinc Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Zirconium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03823 page 1 of 10

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709 / 5000
Short Title: K19 Field Inv.
Golder Contact: Erin O'Brien
Golder E-mail Address 1: erin_o'brien @golder.com
Golder E-mail Address 2: linda_kemp @golder.com
Laboratory Name: AGAT
Address: 120 – 8600 Glenlyon Pkwy, Burnaby BC
Telephone/Fax: (778) 452-4000
Contact: Maggie Chan

Office Name: Vancouver – Virtual Way
EQuIS Facility Code: 2843 3859
EQuIS upload: ☑
WO 17N240971 Jul 22 pm 2:32

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☑ Regular (5 Days)
Criteria: ☐ CSR ☑ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail
Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Metals	LEPH/HEPH/PAH	BTEX/VPH VOC	Nacl Sat. PASC	RUSH (Select TAT above)	Remarks (over)
03823-01	K19-TP17-61	2	1.5	SO	16/07/17	11:30	Discrete			5	X	X	X			Included in previous shipment
-02		3	2.4			11:40				3						
-03		4	3.8			11:50				3						
-04	↓	5	4.4			12:00				5	X	X				
-05	K19-TP17-62	1	0.6			1325		FDA	03823-06	4	X	X		X		
-06		1	0.6			1325		FD	03823-05	4	X	X		X		
-07		2	1.7			1335				5						
-08		3	2.5			1345				3	X					
-09		4	3.6			1355				3						
-10	↓	5	4.2			1405				5		X				
-11	K19-TP17-63	1	0.7			1600				6	X			X		
-12	↓	2	1.9	↓	↓	1610	↓			5	X	X	X			

16ID

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Sampler's Signature:	Relinquished by: Signature / Amey	Company: Golder	Date: July 20/17	Time: 5:00	Received by: Signature	Company
Comments: Invoice Dave Osguthorpe	Method of Shipment:	Waybill No.:	Received for Lab by: SC	Date	Time	
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C): 3	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy

V111618

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03824 page 2 of 10

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709 / 5000
Short Title: K19 Field Inv.
Golder Contact: Erin O'Brien
Golder E-mail Address 1: erin_o'brien @golder.com
Golder E-mail Address 2: linda_kemp @golder.com
Laboratory Name: AGAT
Address: 120-8600 Glenlyon Pkwy, Burnaby BC
Telephone/Fax: (778) 452-4000
Contact: Maggie Chan

Office Name: Vancouver – Virtual Way
EQuIS Facility Code: 28433859
EQuIS upload: ☑
WO: 17N240471 Jul 22 pm 2:32

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☑ Regular (5 Days)
Criteria: ☑ CSR ☑ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail
Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Metals	Lead/Hg/PAH	BTEX/VPH	VOC	Na+Cl soil					RUSH (Select TAT above)	Lab ID / Remarks (over)
03824-01	K19-TP17-63	3	2.7	SO	16/07/17	1620	Discrete			3											8582705
-02	↓	4	4.0		↓	1630				5		X	X								706
-03	K19-TP17-64	1	0.5		17/07/17	1030				6	X				X						708
-04		2	1.5			1040				3											710
-05		3	2.6			1050				3		X									711
-06	↓	4	4.2			1100				5			X	X							712
-07	K19-TP17-65	1	0.5			1200				5											713
-08		2	1.5			1260	‡	FDA	03824-09	3	X	X									723
-09		2	1.5			1210		FD	03824-08	3	X	X									729
-10		3	2.6			1220				5			X	X							730
-11	↓	4	4.1			1230				5		X									741
-12	K19-TP17-66	1	0.5	↓	↓	1325	↓			6	X				X						746

Sampler's Signature:	Relinquished by: Signature / Print: Pamela	Company: Golder	Date: July 20/17	Time: 8:00	Received by: Signature / Company
Comments: Invoice Dave Osgathorpe	Method of Shipment:	Waybill No.:	Received for Lab by:	Date	Time
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C): 3	Cooler opened by:	Date / Time

WHITE: Golder Copy YELLOW: Lab Copy

V111617

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03825 page 3 of 10

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709 / 5000
Short Title: K19 Field Inv.
Golder Contact: Erin O'Brien
Golder E-mail Address 1: erin_o brien @golder.com
Golder E-mail Address 2: linda_kemp @golder.com

Laboratory Name: AGAT
Address: 120-8600 Glenlyon Pkway, Burnaby BC
Telephone/Fax: (778) 452-4000
Contact: Maggie Chan

Office Name: Vancouver - Virtual way
EQuIS Facility Code: 28433859
EQuIS upload: ☑

WO: 17N240971 Jul 22 pm 2:32

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☑ Regular (5 Days)
Criteria: ☑ CSR ☑ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail
Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Metals	LEPH/HEPH/PAH	BTEX/VPH	VOC	Na+Cl Salt/Resistivity	RUSH (Select TAT above)	Lab ID Remarks (over)
03825 - 01	K19-TP17-66	2	[illegible]	SO	17/07/17	1335	Discrete			3	X						8582754
- 02		3	[illegible] 2.5			1345				5							762
- 03	[illegible]	4	[illegible] 4.1			1355				3		X	X				763
- 04	K19-TP17-67	1	1.4			1435				6		X					764
- 05		2	[illegible] 0.5			1445		FDA	03825-06	3				X			766
- 06		2	[illegible] 1.4			1445		FD	03825-05	3							767
- 07		3	[illegible] 2.5			1455				5	X	X	X				768
- 08	[illegible]	4	4.1			1505				3							769
- 09	K19-TP17-68	1	0.6		18/07/17	0940				6	X	X		X			770
- 10		2	1.5			0950				3							772
- 11		3	2.5			1000				5	X	X	X				774
- 12		4	3.5			1010				3							775

Sampler's Signature:	Relinquished by: Signature / Amelia	Company: Golder	Date: Jul 20/17	Time: 8:00	Received by: Signature / Company
Comments: Invoice Dave Osgathorpe	Method of Shipment:	Waybill No.:	Received for Lab by: JC	Date	Time
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C): 3	Cooler opened by:	Date / Time

WHITE: Golder Copy YELLOW: Lab Copy

V111616

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03826 page 4 of 14

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657909 / 5000			Laboratory Name: AGAT
Short Title: K-19 Field Inv.	Golder Contact: Erin O'Brien		Address: 120-8600 Glenlyon PKwy Burnaby BC
Golder E-mail Address 1: erin_o'brien @golder.com	Golder E-mail Address 2: linda_kemp @golder.com		Telephone/Fax: (778) 452-4000 Contact: Maggie Chan

Office Name: Vancouver – Virtual Way

EQuIS Facility Code: 28438859
EQuIS upload: ☑

WO: 17N240971 Jul 22 pm 2:32

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☑ Regular (5 Days)
Criteria: ☑ CSR ☑ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Metals LDR / HDR / PAH	BTEX / VPH F1	VOC	Na, Cl, SAR, Conductivity	RUSH (Select TAT above)	Lab ID Remarks (over)
03826 - 01	K19-TP17-68	5	4.1	SO	18/07/17	10:20	Discrete			5	X	X				8582776
- 02	K19-TP17-69	1	0.6			11:10				6						777
- 03		2	1.5			11:20				3						778
- 04		3	2.6			11:30				5		X				779
- 05		4	3.5			11:40				5						781
- 06		5	5.1			11:50				5	X	X				782
- 07	K19-TP17-70	1	0.5			12:40		FDA	03826-08	6						785
- 08		1	0.5			12:40		FD	03826-09	6						786
- 09		2	1.4			12:50				3						788
- 10		3	2.4			13:00				5		X				789
- 11		4	3.5			13:10				5		X				791
- 12		5	4.9			13:20				5	X	X				794

Sampler's Signature:	Relinquished by: Signature	Company: Golder	Date: Jul 20/17	Time: 8:00	Received by: Signature	Company	
Comments: Invoice Dave Osguthorpe	Method of Shipment:	Waybill No.:	Received for Lab by:		Date	Time	
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C): 3	Cooler opened by:	Date	Time	

WHITE: Golder Copy YELLOW: Lab Copy

V111615

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03827 page 5 of 14

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709 / 5000			Laboratory Name: AGAT
Short Title: K19 Field Inv.	Golder Contact: Erin O'Brien		Address: 120-8600 Glenlyon Pkwy Burnaby BC
Golder E-mail Address 1: Erin_O'brien @golder.com	Golder E-mail Address 2: linda_kemp @golder.com	Telephone/Fax: (778) 452-4000	Contact: Maggie Chan

Office Name: Vancouver – Virtual Way

EQuIS Facility Code: 2843859
EQuIS upload: ☑

WO: 17N240971

Jul 22 pm 2:32

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☑ Regular (5 Days)
Criteria: ☑ CSR ☑ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Metals / LEPH / HEPH / PAH	BTEX / VOC	Na + Cl soil paste	RUSH (Select TAT above)	Lab ID Remarks (over)
03827-01	KA-TP17-71	1	0.5	SO	18/07/17	1500	Discrete			6		X			8582795
-02		2	1.5			1510				3					805
-03		3	2.5			1520		FDA	03827-04	5	X	X	X		809
-04		3	2.5			1520		FD	03827-03	5	X	X	X		811
-05		4	4.2			1530				3					815
-06	KA-TP17-72	1	0.6		9/07/17	0925				6			X		820
-07		2	1.6			0935				3					828
-08		3	2.4			0945				5	X	X	X		829
-09		4	4.0			0955				5					830
-10	KA-TP17-73	1	0.5			1045				6			X		832
-11		2	1.4			1055				5	X	X			833
-12		3	2.5			1105				4					additional jar to be included in shipment 835

Sampler's Signature:	Relinquished by: Signature	Company: Golder	Date: JULY 20/17	Time: 8:00	Received by: Signature	Company	
Comments: Invoice Dave Osgathorpe	Method of Shipment:	Waybill No.:	Received for Lab by: JL	Date	Time		
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C): 3	Cooler opened by:	Date	Time	

WHITE: Golder Copy YELLOW: Lab Copy

V111614

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03811 page 1 of 10

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709/5000		Laboratory Name: AGAT	
Short Title: Alaska Highway - K19	Golder Contact: Erin O'brien	Address: 120 - 8600 Glenlyon Parkway, Burnaby, BC	
Golder E-mail Address 1: erin_o'brien @golder.com	Golder E-mail Address 2: linda-kemp @golder.com	Telephone/Fax: 778-452-4000	Contact: Maggie Chan

Office Name: Vancouver, VIRTUAL WAY

EQuIS Facility Code: 28533859
EQuIS upload: ☐

WO: 17N240971 Jul 22 pm 2:32

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Regular (5 Days)
Criteria: ☐ CSR ☐ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Metals	LEPH/HEPH/PAH	BTEX/VOC	VOC	Wet Chem					RUSH (Select TAT above)	Remarks (over)
03811 - 01	K19-HA17-01	1	0.20-0.30	SO	17/07/17	13:05	GRAB	-	-	4	X				X						
03811 - 02	K19-HA17-02	1	0.45-0.65	SOIL	17/07/17	11:00	GRAB	-	-	4					X						
03811 - 03	K19-HA17-03	1	0.35-0.50	SO	17/07/17	16:30	GRAB	-	-	4					X						
03811 - 04	K19-HA17-01	2	0.50-0.60	SO	17/07/17	13:05	GRAB	-	-	6			X		X						lab 1 VOC vials
03811 - 05	K19-HA17-04	1	0.40-0.60	SO	17/07/17	16:25	GRAB	FDA	03811-06	4					X						
03811 - 06	K19-HA17-04	1	0.40-0.60	SO	17/07/17	16:25	GRAB	FD	03811-05	4					X						
03811 - 07	K19-HA17-05	1	0.20-0.30	SO	17/07/17	17:00	GRAB	-	-	4					X						
- 08																					
- 09																					
- 10																					
- 11																					
- 12																					

lab ID
85582868
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884

Sampler's Signature:	Relinquished by: Signature: Andrew	Company: GOLDER	Date: 26 JY 2017	Time: 8:00	Received by: Signature:	Company	
Comments: invoice Dave Osgthorpe	Method of Shipment: Drop OFF	Waybill No.:	Received for Lab by: JC	Date	Time		
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C): 3	Cooler opened by:	Date	Time	

WHITE: Golder Copy YELLOW: Lab Copy

V111613

SEDIMENT SAMPLES

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03813 page 1 of 1

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657701/5000
Short Title: K19 - Alaska Highway
Golder Contact: Eric O'brien
Golder E-mail Address 1: eric_o'brien @golder.com
Golder E-mail Address 2: linda_leap @golder.com
Laboratory Name: AGAT
Address: 180-8600 Glenlyon Parkway, Burnaby, BC
Telephone/Fax: 778-452-4000
Contact: Maggie Chao

Office Name: Vancouver
EQuIS Facility Code: 2843 3350
EQuIS upload: ☐
WO: 17N240971 Jul 22 pm 2:32

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☑ Regular (5 Days)
Criteria: ☐ CSR ☐ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail
Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	METALS	LEPH/HEPH/PAH	BTEX/VPHS	VOCS	TOC	Sodium Chloride **				RUSH (Select TAT above)	Remarks (over)	Lab ID
03813 - 01	K19-SS17-01	1	~0.10	SE	18/07/17	-	GRAB	-	-	5	X	X	X	X	X	X					* Silica	8582885
- 02	K19-SS17-02	1	~0.10			-		-	-	5	X		X								gel clean up	888
- 03	K19-SS17-03	1	~0.10			-		-	-	5	X	X	X	X	X	X						890
- 04	K19-SS17-04	1	~0.10			-		-	-	5	X		X								** Note	891
- 05	K19-SS17-05	1	~0.10			-		FDA	03813-06	5	X	X	X	X	X	X					with the	893
- 06	K19-SS17-05	1	~0.10			-		FD	03813-05	5	X	X	X	X	X	X					saturated	896
- 07	K19-SS17-06	1	~0.10			-		-	-	5	X		X								paste method	899
- 08	K19-SS17-07	1	~0.10			-		-	-	5	X	X	X	X	X	X						902
03813 - 09	K19-SS17-08	1	~0.10	SE	18/07/17	-	GRAB	-	-	5	X		X								Thanks	903
- 10																						
- 11																						
- 12																						

Sampler's Signature	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
		GOLDER	July 20/17	8:00		

Comments	Method of Shipment	Waybill No.	Received for Lab by:	Date	Time
Invoice TO: Dave Osguthorpe	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C): 3	Cooler opened by:	Date / Time

WHITE: Golder Copy YELLOW: Lab Copy

V111643

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03814 page 1 of 1

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709/5000		Laboratory Name: AGAT	
Short Title: K14 Field Investigation	Golder Contact: Erin O'Brien	Address: 120-2600 Gidman Rd	
Golder E-mail Address 1: erin_obrien @golder.com	Golder E-mail Address 2: [illegible] @golder.com	Telephone/Fax: (778) 452-4000	Contact: Maggie Chan

Office Name: Vancouver - Virtual Way

EQuIS Facility Code: 2943259
EQuIS upload: ☐

WO: 17N240971 JUL 22 PM2:32

Analyses Required

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Regular (5 Days)
Criteria: ☐ CSR ☐ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Dissolved Metals	BTEX - VPH	Mercury	Chloride	VOCs	Alkalinity	Total Phenols	F1	F2 - F4	RUSH (Select TAT above)	Remarks (over)
03814 - 01	K14-SW17-01										X	X	X	X	X				X		
- 02	K14-SW17-02										X	X	X	X			X				
- 03	K14-SW17-03																				
- 04	K14-SW17-04										X	X	X	X			X				
- 05	K14-SW17-05	FD									X	X	X	X	X	X	X	X	X		
- 06	K14-SW17-05	FDA									X	X	X	X	X		X		X		
- 07	K14-SW17-06										X	X	X	X			X				
- 08																					
- 09																					
- 10																					
- 11																					
- 12																					

Sampler's Signature:	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
		GOLDER	July 20/17	800		
Comments: Invoice Dave Osgethorpe	Method of Shipment:	Waybill No.:	Received for Lab by: S-Naper		Date	Time
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C) 3	Cooler opened by:	Date	Time

WHITE: Golder Copy **YELLOW:** Lab Copy

V111631

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03830 page __ of 11

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709/5000			Laboratory Name: AGAT
Short Title: K19 Field Inv.	Golder Contact:		Address: 120 - 9600 Glenlyon Pkwy, Burnaby BC
Golder E-mail Address 1: erin-o'rourke@golder.com	Golder E-mail Address 2: linda-kemp@golder.com		Telephone/Fax: 778 452-4000 Contact: maggie Chan

Office Name: Vancouver

EQuIS Facility Code: 28433859
EQuIS upload: ☑

WO: 17N210971
JUL 22 PM 2:32

Analyses Required

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Regular (5 Days)
Criteria: ☒ CSR ☐ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	D. Metals	BTEX/VPH	PAHs/LEPH/HEPH	VOCs	Chlorides	F2-F4				RUSH (Select TAT above)	Remarks (over)
03830 - 01	K19-MW17-11		7.0	WG	6/07/17	15:06				9	X	X	X	X							HOLD T2 F4
- 02	K19-09MW-06			WG		15:15		FD		10	X	X	X		X						
- 03	K19-09MW-06					15:15		FDA			X	X	X	-	X						
- 04	K19-MW17-13					16:22				10	X	X	X	X	-						HOLD F2-F4
- 05	K19A-09MW-02										X	X	X		X						
- 06																					
- 07																					
- 08																					
- 09																					
- 10																					
- 11																					
- 12																					

Sampler's Signature:	Relinquished by: Signature	Company: GOLDER	Date: July 20/17	Time: 9:00	Received by: Signature	Company
Comments: Invoice Dave & Ogut hope	Method of Shipment:	Waybill No.:	Received for Lab by: S. Nape	Date	Time	
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C): 3	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy

V111630

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03831 page 10 of 11

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 165-7709/5000			Laboratory Name: AGAT
Short Title: K19 Field Inv.	Golder Contact: Erin O'Brien		Address: 120-8600 Glenlyon Parkway
Golder E-mail Address 1: erin_o'brien @golder.com	Golder E-mail Address 2: Alvaro-Garrido-Hernandez@golder.com		Telephone/Fax: 778-452-4000 Contact: Maggie Chan

Office Name: Vancouver
EQuIS Facility Code: 28433859
EQuIS upload: ☒

WO: 17N240971 Jul 7 2pm 2:32

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Regular (5 Days)
Criteria: ☒ CSR ☐ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail
Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Metals	LEPH/HEPH/PAH	BTEX/VPH	VOC	Nutrients					RUSH (Select TAT above)	Lab ID Remarks (over)
03831 - 01	KW17-17	1	0.3-0.5	Soil	18/07/17	13:30	Discrete			5											8582988
- 02		2	1.8-2.1			13:50				3											989
- 03		3	3.1-3.3			14:00				5											991
- 04		4	4.3-4.5			14:20				3		X									992
- 05		5	5.2-5.8			14:50				5		X	X	X							993
- 06		6	7.0-6.5			15:30				3		X									994
- 07	KW17-18	1	0.3-0.5		19/07/17	09:00		FDA	03831-08	5	X				X						995
- 08		1	0.3-0.5			09:00		FD	03831-07	3	X				X						996
- 09		2	1.5-1.8			9:30				3		X									998
- 10		~~4~~ 4	~~3.8-4.2~~ 4.5-4.8			9:00				5		X	X	X							999
- 11		3	2.8-3.2			09:50				3											000
- 12		5	5.2-5.5			10:30				3		X									001

Sampler's Signature:	Relinquished by: Signature: Amelia	Company: GOLDER	Date: July 20/17	Time: 8:00	Received by: Signature	Company
Comments: INVOICE DAVE OSGOUTHORPE	Method of Shipment:	Waybill No.:	Received for Lab by: JL	Date		Time
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C): 3	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy

V111612

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03832 page 1 of 1

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709/5000
Short Title: K19 Field Inv.
Golder Contact: Erin O'brien
Golder E-mail Address 1: Erin_O'brien @golder.com
Golder E-mail Address 2: @golder.com
Laboratory Name: AGAT
Address: 120-Clarkson Parkway, Burnaby, BC
Telephone/Fax: 778-452-4000
Contact: Maggie Chan

Office Name: Vancouver
EQuIS Facility Code: 28433859
EQuIS upload: ☒
WO: 17N240471
Jul 22 pm 2:32

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Regular (5 Days)
Criteria: ☒ CSR ☐ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail
Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	metals	BTEX/HEPH/CPH	BTEX/HPH	VOC	Na + Cl salt	RUSH (Select TAT above)	Lab ID Remarks (over)
03832-01	K19-HW19	6	6.5-7.8	So.	19/07/17	10:50	Discrete			3							8583003
-02	↓	7	7.5-8.5			11:20	↓			5		X	X	X			004
-03		8	9.0-10.0			11:50				3							005
-04	↓	9	12-13		↓	12:20				6		X	X				006
-05	K19-HW119	1	0.3-0.5			14:00				5	X				X		007
-06		2	1.8-2.1			14:20				3		X					009
-07		3	3.5-4.0			14:40				3							010
-08		4	5-6			15:00		FDA	03832-09	5		X	X	X			011
-09		4	5-6			15:00		FD	03832-08	3							013
-10		5	6-7			15:30				3							014
-11		6	7-8		↓	16:00				5		X	X				016
12																	

Sampler's Signature:
Relinquished by: Signature: Amy
Company: GOLDER
Date: July 26/17
Time: 8:00
Received by: Signature:
Company:

Comments: Invoice Dave Osguthorpe
Method of Shipment: J
Waybill No.:
Received for Lab by: JC
Date:
Time:
Shipped by:
Shipment Condition:
Seal Intact:
Temp (°C): 3
Cooler opened by:
Date:
Time:

WHITE: Golder Copy YELLOW: Lab Copy

V111611

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM

RECEIVING BASICS - Shipping

Company/Consultant: GOLDER

Courier: _____ Prepaid Collect

Waybill# _____

Branch: EDM GP (FN) FM RD VAN LYD FSJ EST Other: _____

Custody Seal Intact: Yes (No) NA

TAT: <24hr 24-48hr 48-72hr (Reg) Other _____

Cooler Quantity: 10

TIME SENSITIVE ISSUES - Shipping

ALREADY EXCEEDED HOLD TIME? Yes (No)

Inorganic Tests (Please Circle): Mibi , BOD , Nitrate/Nitrite , Turbidity , Microtox , Ortho PO4 , Tedlar Bag , Residual Chlorine , Chlorophyll* , Chloroamines*

Earliest Expiry: _____

Hydrocarbons: Earliest Expiry _____

SAMPLE INTEGRITY - Shipping

Hazardous Samples: YES (NO) Precaution Taken: _____

Legal Samples: Yes (No)

International Samples: Yes (No)

Tape Sealed: Yes (No)

Coolant Used: Icepack Bagged Ice Free Ice Free Water None

Temperature (Bottles/Jars only) N/A if only Soil Bags Received

FROZEN (Please Circle if samples received Frozen)

1 (Bottle/Jar) 11 + 8 + 10 = 10 °C	2(Bottle/Jar) 8 + 8 + 10 = 9 °C
3 (Bottle/Jar) 3 + 5 + 7 = 5 °C	4 (Bottle/Jar) 5 + 6 + 6 = 6 °C
5 (Bottle/Jar) 9 + 2 + 3 = 5 °C	6 (Bottle/Jar) 2 + 4 + 1 = 2 °C
7 (Bottle/Jar) 4 + 7 + 8 = 8 °C	8 (Bottle/Jar) 2 + 6 + 7 = 5 °C
9 (Bottle/Jar) 8 + 4 + 6 = 6 °C	10 (Bottle/Jar) 6 + 4 + 3 = 3 °C

(If more than 10 coolers are received use another sheet of paper and attach)

LOGISTICS USE ONLY

Workorder No: _____

Samples Damaged: Yes (No) If YES why?

No Bubble Wrap Frozen Courier

Other: _____

Account Project Manager: _____ have they been notified of the above issues: Yes No

Whom spoken to: _____ Date/Time: _____

CPM Initial _____

General Comments: _____

* Subcontracted Analysis (See CPM)

Date issued: May 22, 2015

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM - BURNABY

Work Order # 17N240971

RECEIVING BASICS:
Received From: Rosenau #1 Waybill #: _____

SAMPLE QUANTITIES:
Coolers: 12 Containers: ~~560~~ 563

TIME SENSITIVE ISSUES:
Earliest Date Sampled: 16 July 17 ALREADY EXCEEDED? Yes (No)

NON-CONFORMANCES: (12) 0 + 4 + 4 = 2

3 temperatures of samples* and average of each cooler: (record differing temperatures on the CoC next to sample ID's) *use jars when available (10) 4 + 4 + 4 = 4, (11) 3 + 3 + 3 = 3

(1) 5 + 5 + 6 = 5 °C (2) 3 + 2 + 1 = 2 °C (3) 3 + 3 + 4 = 3 °C (4) 5 + 2 + 2 = 3 °C 3 °C

Was ice or ice pack present: (Yes) No (5) 3 + 5 + 4 = 4, (6) 0 + 0 + 1 = 0

Integrity Issues: (7) 1 + 1 + 2 = 1 (8) 3 + 4 + 4 = 4 (9) 4 + 2 + 3 3

Account Project Manager: _____ have they been notified of the above issues: Yes No

Whom spoken to: _____ Date and Time: _____

ADDITIONAL NOTES:

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM

RECEIVING BASICS - Shipping

Company/Consultant: PUBLIC WORKS of GOOD. SEX.

Courier: PUROLATOR Prepaid Collect

Waybill# 331119 047998

Branch: EDM GP FN FM RD (VAN) LYD FSJ EST Other:____

If multiple sites were submitted at once: (Yes) No

Custody Seal Intact: Yes No (NA)

TAT: <24hr 24-48hr 48-72hr (Reg) Other_____

Cooler Quantity: 1

TIME SENSITIVE ISSUES - Shipping

ALREADY EXCEEDED HOLD TIME? Yes No

Inorganic Tests (Please Circle): Mibi , BOD , Nitrate/Nitrite , Turbidity , Microtox , Ortho PO4 , Tedlar Bag , Residual Chlorine , Chlorophyll* , Chloroamines*

Earliest Expiry:_____

Hydrocarbons: Earliest Expiry _____

SAMPLE INTEGRITY - Shipping

Hazardous Samples: YES (NO) Precaution Taken:_____

Legal Samples: Yes (No)

International Samples: Yes (No)

Tape Sealed: Yes (No)

Coolant Used: Icepack Bagged Ice Free Ice Free Water None

Temperature (Bottles/Jars only) N/A if only Soil Bags Received

FROZEN (Please Circle if samples received Frozen)

1 (Bottle/Jar) 5 + 5 + 5 = 5 °C 2(Bottle/Jar)___+___+___=____ °C

3 (Bottle/Jar)___+___+___=____ °C 4 (Bottle/Jar)___+___+___=____ °C

5 (Bottle/Jar)___+___+___=____ °C 6 (Bottle/Jar)___+___+___=____ °C

7 (Bottle/Jar)___+___+___=____ °C 8 (Bottle/Jar)___+___+___=____ °C

9 (Bottle/Jar)___+___+___=____ °C 10 (Bottle/Jar)___+___+___=____ °C

(If more than 10 coolers are received use another sheet of paper and attach)

LOGISTICS USE ONLY

Workorder No: 17N24097

Samples Damaged: Yes (No) If YES why?

No Bubble Wrap Frozen Courier

Other: _____

Account Project Manager: _____ have they been notified of the above issues: Yes No

Whom spoken to: _____ Date/Time: _____

CPM Initial_____

General Comments: _____

* Subcontracted Analysis (See CPM)

Date issued: October 05, 2015

Document ID: SR-9505 003

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
219-800 BURRARD ST
VANCOUVER, BC V6Z 0B9
604-671-1831

ATTENTION TO: Erin O'Brien

PROJECT: 1657709.5000

AGAT WORK ORDER: 17N242036

SOIL ANALYSIS REVIEWED BY: Jennifer Liu, Analyst, Qualified Person

TRACE ORGANICS REVIEWED BY: Andrew Garrard, B.Sc., General Manager

WATER ANALYSIS REVIEWED BY: Andrew Garrard, B.Sc., General Manager

DATE REPORTED: Aug 04, 2017

PAGES (INCLUDING COVER): 78

VERSION*: 2

Should you require any information regarding this analysis please contact your client services representative at (778) 452-4000

*NOTES

VERSION 2: Sample receipt temperature 5°C.

Version 2 issued on September 22, 2017 to report additional SWEP metals as requested by Erin O'Brien of Golder. Version 2 is an amendment to version 1.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

(SWEP) Metals

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03840-02
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2017-07-20
Parameter	Unit	G / S	RDL	8590499
Arsenic - Leachate (SWEP)	mg/L	2.5	0.5	<0.5
Barium - Leachate (SWEP)	mg/L	100	0.5	<0.5
Boron - Leachate (SWEP)	mg/L	500	0.5	<0.5
Cadmium - Leachate (SWEP)	mg/L	0.5	0.5	<0.5
Chromium - Leachate (SWEP)	mg/L	5	0.5	<0.5
Copper - Leachate (SWEP)	mg/L	100	0.5	<0.5
Lead - Leachate (SWEP)	mg/L	5	0.5	<0.5
Mercury - Leachate (SWEP)	mg/L	0.1	0.1	<0.1
Selenium - Leachate (SWEP)	mg/L	1	0.5	<0.5
Silver - Leachate (SWEP)	mg/L	5	0.5	<0.5
Uranium - Leachate (SWEP)	mg/L	10	0.5	<0.5
Zinc - Leachate (SWEP)	mg/L	500	0.5	0.5

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to NORTHERN ROCKIES
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8590499 Analysis based on 'as received'.

Certified By:

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Metals in Soil

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: 03828-01	03828-02	03828-06	03828-10	03829-03	03829-07	03833-01	03834-11
				SAMPLE TYPE: Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
				DATE SAMPLED: 2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-21
				8590247	8590249	8590253	8590257	8590288	8590299	8590359	8590436
Aluminum	µg/g		10	12000	12100	16100	13300	13000	12300	7800	11600
Antimony	µg/g		0.1	0.5	0.3	0.6	0.5	0.7	0.6	0.5	0.5
Arsenic	µg/g		0.1	9.8	10.2	12.3	9.0	13.3	10.6	8.3	11.4
Barium	µg/g		0.5	297	648	406	472	1070	304	204	208
Beryllium	µg/g		0.1	0.7	0.5	0.9	0.8	1.1	0.8	0.4	0.7
Bismuth	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	µg/g		0.01	0.17	0.07	0.22	0.16	0.97	0.41	0.32	0.15
Calcium	µg/g		10	2190	3050	3180	2570	2980	3500	14500	1900
Chromium	µg/g		1	20	19	23	20	25	22	15	22
Cobalt	µg/g		0.1	8.0	3.1	12.8	6.4	20.3	10.9	6.3	12.6
Copper	µg/g		0.2	24.6	27.1	28.7	25.6	38.6	27.4	11.4	22.0
Iron	µg/g		10	23000	30600	32300	27600	26000	24500	23200	23700
Lead	µg/g		0.1	11.7	13.4	13.7	11.3	18.6	13.2	9.4	14.5
Lithium	µg/g		0.5	11.8	13.6	14.8	13.3	26.9	15.1	8.8	14.2
Magnesium	µg/g		10	2890	3150	4160	3270	2940	3360	4670	2810
Manganese	µg/g		1	251	46	459	281	2660	391	244	380
Mercury	µg/g		0.01	0.06	0.04	0.05	0.06	0.08	0.06	0.02	0.04
Molybdenum	µg/g		0.2	1.7	0.9	2.1	1.5	1.9	1.6	1.4	2.0
Nickel	µg/g		0.5	24.8	14.0	33.2	29.2	94.6	35.6	16.1	20.9
Phosphorus	µg/g		5	558	965	798	666	739	722	789	533
Potassium	µg/g		5	1590	2330	2140	1630	1690	1910	1200	1470
Selenium	µg/g		0.1	0.7	0.5	1.0	0.9	1.2	0.6	0.5	0.8
Silver	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sodium	µg/g		5	74	399	111	99	95	97	107	68
Strontium	µg/g		1	34	100	38	32	52	41	32	24
Thallium	µg/g		0.1	0.2	0.1	0.2	0.2	0.3	0.2	0.1	0.2
Tin	µg/g		0.2	0.5	0.5	0.6	0.5	0.7	0.6	0.4	0.5
Titanium	µg/g		1	75	33	95	51	46	52	95	93
Uranium	µg/g		0.2	1.0	1.3	1.2	1.0	1.5	1.2	0.7	1.3
Vanadium	µg/g		1	37	26	41	37	44	39	33	42

Certified By:

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Metals in Soil

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03828-01	03828-02	03828-06	03828-10	03829-03	03829-07	03833-01	03834-11
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-21
Parameter	Unit	G / S	RDL	8590247	8590249	8590253	8590257	8590288	8590299	8590359	8590436
Zinc	µg/g		1	85	51	103	91	157	104	65	82
Zirconium	µg/g		0.1	3.7	2.1	4.1	3.1	3.0	4.0	0.8	1.2
pH 1:2	pH units		0.05	5.60	6.70	5.53	5.67	6.76	6.99	7.74	5.72

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Certificate of Analysis

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Metals in Soil

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: 03835-08	03840-04	03840-09	03841-01	03842-03	03842-05	03842-06	03842-08
				SAMPLE TYPE: Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
				DATE SAMPLED: 2017-07-22	2017-07-21	2017-07-21	2017-07-21	2017-07-22	2017-07-22	2017-07-22	2017-07-22
				8590480	8590501	8590507	8590511	8590567	8590572	8590573	8590576
Aluminum	µg/g		10	13000	12600	15100	12600	13000	11300	12900	13900
Antimony	µg/g		0.1	0.5	0.6	0.5	0.5	0.5	0.3	0.3	0.4
Arsenic	µg/g		0.1	11.1	12.7	10.4	8.8	9.8	8.9	10.4	10.2
Barium	µg/g		0.5	318	458	695	742	549	558	595	700
Beryllium	µg/g		0.1	0.9	0.7	0.8	0.7	0.8	0.6	0.6	0.8
Bismuth	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	µg/g		0.01	0.22	0.15	0.18	0.16	0.17	0.12	0.11	0.13
Calcium	µg/g		10	2030	2290	2910	3030	2110	2460	2720	2530
Chromium	µg/g		1	21	22	19	19	21	19	23	20
Cobalt	µg/g		0.1	14.3	10.3	23.4	8.5	11.9	6.0	5.2	9.8
Copper	µg/g		0.2	27.2	26.5	24.8	27.0	25.2	20.1	20.2	25.3
Iron	µg/g		10	25600	27800	32500	27000	26600	23100	27800	28300
Lead	µg/g		0.1	14.7	13.3	14.5	14.9	14.7	19.1	19.6	14.0
Lithium	µg/g		0.5	15.0	13.2	14.5	12.5	14.7	21.2	20.1	17.0
Magnesium	µg/g		10	3010	3170	3750	2790	3030	2860	3210	3170
Manganese	µg/g		1	486	252	761	193	400	114	103	275
Mercury	µg/g		0.01	0.05	0.05	0.04	0.07	0.05	0.04	0.04	0.05
Molybdenum	µg/g		0.2	2.0	1.6	1.4	1.1	1.7	0.7	0.7	1.3
Nickel	µg/g		0.5	30.8	27.4	38.2	25.1	29.7	19.0	18.7	27.6
Phosphorus	µg/g		5	546	629	715	621	609	462	629	545
Potassium	µg/g		5	1600	1710	1910	2070	1710	1960	2250	1780
Selenium	µg/g		0.1	0.9	1.0	0.7	0.7	1.0	0.7	0.6	0.7
Silver	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sodium	µg/g		5	73	85	161	435	114	144	159	166
Strontium	µg/g		1	34	31	32	70	34	41	41	42
Thallium	µg/g		0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
Tin	µg/g		0.2	0.5	0.6	0.6	0.6	0.6	0.7	0.6	0.6
Titanium	µg/g		1	71	58	63	46	60	22	25	42
Uranium	µg/g		0.2	1.4	1.1	1.0	0.9	1.0	1.6	1.8	0.9
Vanadium	µg/g		1	37	39	33	30	36	24	24	31

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Certificate of Analysis

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Metals in Soil

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03835-08	03840-04	03840-09	03841-01	03842-03	03842-05	03842-06	03842-08
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-22	2017-07-21	2017-07-21	2017-07-21	2017-07-22	2017-07-22	2017-07-22	2017-07-22
Parameter	Unit	G / S	RDL	8590480	8590501	8590507	8590511	8590567	8590572	8590573	8590576
Zinc	µg/g		1	114	101	95	76	101	65	66	86
Zirconium	µg/g		0.1	2.7	2.3	2.4	2.0	1.6	1.7	1.7	2.0
pH 1:2	pH units		0.05	5.50	5.48	5.61	6.14	5.41	6.48	6.53	5.65

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8590247-8590576 Results are based on the dry weight of the sample

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CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Soil Salinity - Na & Cl

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03833-01	03834-11	03835-08	03840-04	03842-03	03842-08	03843-05
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-20	2017-07-21	2017-07-22	2017-07-21	2017-07-22	2017-07-22	2017-07-22
Parameter	Unit	G / S	RDL	8590359	8590436	8590480	8590501	8590567	8590576	8590592
Chloride, Soluble	mg/L		2	12	4	3	3	6	5	8
Sodium, Soluble	mg/L		2	42	6	3	3	5	4	12
Saturation Percentage	%		0.1	34.2	42.6	46.4	46.4	42.9	50.2	49.9
Chloride, Soluble (mg/kg)	mg/kg		2	4	<2	<2	<2	3	3	4
Sodium, Soluble (mg/kg)	mg/kg		2	14	3	<2	<2	2	2	6

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8590359-8590436 Due to the insufficient sample volume, less than the recommended sample volume was used for analysis of saturated paste.

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CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

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SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03828-02	03828-06	03828-11	03829-02	03829-04	03829-06	03829-07	03829-10
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20
Parameter	Unit	G / S	RDL	8590249	8590253	8590258	8590275	8590289	8590298	8590299	8590309
Naphthalene	µg/g		0.005	<0.005	<0.005	<0.005	0.225	<0.005	0.089	<0.005	0.048
2-Methylnaphthalene	µg/g		0.005	<0.005	<0.005	<0.005	0.524	0.007	0.227	<0.005	0.219
1-Methylnaphthalene	µg/g		0.005	<0.005	<0.005	0.006	0.382	0.012	0.165	<0.005	0.152
Acenaphthylene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthene	µg/g		0.005	<0.005	<0.005	0.009	<0.005	<0.005	<0.005	<0.005	<0.005
Fluorene	µg/g		0.02	<0.02	<0.02	<0.02	0.07	<0.02	0.02	<0.02	0.06
Phenanthrene	µg/g		0.02	<0.02	<0.02	0.02	0.22	0.03	0.16	<0.02	0.17
Anthracene	µg/g		0.004	<0.004	<0.004	0.023	<0.004	<0.004	<0.004	<0.004	<0.004
Fluoranthene	µg/g		0.01	<0.01	<0.01	<0.01	0.02	0.01	0.02	<0.01	0.02
Pyrene	µg/g		0.01	<0.01	<0.01	<0.01	0.04	0.01	0.04	<0.01	0.04
Benzo(a)anthracene	µg/g		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Chrysene	µg/g		0.05	<0.05	<0.05	<0.05	0.06	0.05	0.05	<0.05	0.05
Benzo(b)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(j)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo(g,h,i)perylene	µg/g		0.05	<0.05	<0.05	<0.05	0.07	<0.05	0.06	<0.05	0.06
Quinoline	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
IACR CCME (Soil)	µg/g		0.6	<0.6	<0.6	<0.6	0.6	<0.6	0.6	<0.6	0.6
B[a]P TPE (Soil)	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EPH C10-C19	µg/g		20	<20	<20	<20	55	<20	38	<20	44
EPH C19-C32	µg/g		20	22	29	28	58	35	40	22	46
LEPH C10-C19	µg/g		20	<20	<20	<20	55	<20	38	<20	44
HEPH C19-C32	µg/g		20	22	29	28	58	35	40	22	45
Benzo(b+j)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:	03828-02	03828-06	03828-11	03829-02	03829-04	03829-06	03829-07	03829-10
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20
Surrogate	Unit	Acceptable Limits	8590249	8590253	8590258	8590275	8590289	8590298	8590299	8590309
Naphthalene - d8	%	50-130	96	97	102	91	93	96	102	101
2-Fluorobiphenyl	%	50-130	85	87	88	80	83	84	91	88
P-Terphenyl - d14	%	60-130	111	109	107	101	112	104	118	105

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DATE RECEIVED: 2017-07-26

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SAMPLE DESCRIPTION:				03833-03		03833-05		03833-06		03833-10	03834-02
SAMPLE TYPE:				Soil		Soil		Soil		Soil	Soil
DATE SAMPLED:				2017-07-20		2017-07-20		2017-07-20		2017-07-21	2017-07-21
Parameter	Unit	G / S	RDL	8590368	RDL	8590370	RDL	8590372	RDL	8590381	8590417
Naphthalene	µg/g		0.005	0.049	0.05	1.54	0.05	0.94	0.05	0.99	1.28
2-Methylnaphthalene	µg/g		0.005	0.181	0.05	2.74	0.05	1.72	0.05	1.58	2.43
1-Methylnaphthalene	µg/g		0.005	0.148	0.05	1.88	0.05	1.20	0.05	1.10	1.65
Acenaphthylene	µg/g		0.005	<0.005	0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05
Acenaphthene	µg/g		0.005	<0.005	0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05
Fluorene	µg/g		0.02	<0.02	0.2	0.2	0.2	<0.2	0.2	<0.2	0.2
Phenanthrene	µg/g		0.02	0.40	0.2	0.5	0.2	0.4	0.2	0.3	0.5
Anthracene	µg/g		0.004	<0.004	0.04	<0.04	0.04	<0.04	0.04	<0.04	<0.04
Fluoranthene	µg/g		0.01	0.05	0.01	0.04	0.01	0.03	0.01	0.03	0.04
Pyrene	µg/g		0.01	0.06	0.01	0.08	0.01	0.06	0.01	0.05	0.08
Benzo(a)anthracene	µg/g		0.03	<0.03	0.03	<0.03	0.03	<0.03	0.03	<0.03	<0.03
Chrysene	µg/g		0.05	0.15	0.05	0.13	0.05	0.08	0.05	0.07	0.12
Benzo(b)fluoranthene	µg/g		0.05	0.07	0.05	0.06	0.05	<0.05	0.05	<0.05	0.05
Benzo(j)fluoranthene	µg/g		0.05	<0.05	0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	<0.03	0.03	0.03	0.03	<0.03	0.03	<0.03	0.03
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.005	0.006	0.005	0.006	0.005	<0.005	0.005	<0.005	0.005
Benzo(g,h,i)perylene	µg/g		0.05	0.11	0.05	0.15	0.05	0.13	0.05	0.09	0.13
Quinoline	µg/g		0.05	<0.05	0.5	<0.5	0.05	<0.05	0.5	<0.5	<0.5
IACR CCME (Soil)	µg/g		0.6	0.9	0.6	0.9	0.6	0.6	0.6	0.6	0.8
B[a]P TPE (Soil)	µg/g		0.05	<0.05	0.05	0.05	0.05	<0.05	0.05	<0.05	0.05
EPH C10-C19	µg/g		20	57	20	124	20	81	20	68	106
EPH C19-C32	µg/g		20	76	20	121	20	72	20	68	95
LEPH C10-C19	µg/g		20	57	20	122	20	80	20	66	105
HEPH C19-C32	µg/g		20	76	20	121	20	72	20	68	95
Benzo(b+j)fluoranthene	µg/g		0.05	0.07	0.05	0.06	0.05	<0.05	0.05	<0.05	0.05

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AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:	03833-03	03833-05	03833-06	03833-10	03834-02
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	2017-07-20	2017-07-20	2017-07-20	2017-07-21	2017-07-21
Surrogate	Unit	Acceptable Limits	8590368	8590370	8590372	8590381	8590417
Naphthalene - d8	%	50-130	100	105	87	87	104
2-Fluorobiphenyl	%	50-130	86	90	82	75	93
P-Terphenyl - d14	%	60-130	106	103	97	97	106

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SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

SAMPLE DESCRIPTION:				03834-05	03834-06		03834-07		03834-09	03834-10	03835-01
SAMPLE TYPE:				Soil	Soil		Soil		Soil	Soil	Soil
DATE SAMPLED:				2017-07-21	2017-07-21		2017-07-21		2017-07-21	2017-07-21	2017-07-21
Parameter	Unit	G / S	RDL	8590421	8590423	RDL	8590427	RDL	8590432	8590434	8590466
Naphthalene	µg/g		0.05	0.71	1.28	0.05	1.08	0.05	2.20	0.66	0.75
2-Methylnaphthalene	µg/g		0.05	1.41	1.93	0.05	1.62	0.05	3.03	2.51	1.55
1-Methylnaphthalene	µg/g		0.05	0.97	1.34	0.05	1.15	0.05	2.11	1.63	1.12
Acenaphthylene	µg/g		0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05	<0.05
Acenaphthene	µg/g		0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05	<0.05
Fluorene	µg/g		0.2	<0.2	<0.2	0.2	<0.2	0.2	0.2	0.2	<0.2
Phenanthrene	µg/g		0.2	0.3	0.4	0.2	0.4	0.2	0.5	0.9	0.4
Anthracene	µg/g		0.04	<0.04	<0.04	0.04	<0.04	0.04	<0.04	<0.04	<0.04
Fluoranthene	µg/g		0.01	0.03	0.03	0.01	0.04	0.01	0.04	0.04	0.04
Pyrene	µg/g		0.01	0.06	0.06	0.01	0.07	0.01	0.08	0.09	0.08
Benzo(a)anthracene	µg/g		0.03	<0.03	<0.03	0.03	<0.03	0.03	<0.03	<0.03	<0.03
Chrysene	µg/g		0.05	0.09	0.08	0.05	0.08	0.05	0.12	0.15	0.11
Benzo(b)fluoranthene	µg/g		0.05	<0.05	<0.05	0.05	0.05	0.05	0.05	0.06	0.05
Benzo(j)fluoranthene	µg/g		0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	<0.03	<0.03	0.03	0.03	0.03	0.03	0.03	0.04
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.005	<0.005	<0.005	0.005	<0.005	0.005	<0.005	0.005	0.005
Benzo(g,h,i)perylene	µg/g		0.05	0.11	0.10	0.05	0.17	0.05	0.13	0.14	0.15
Quinoline	µg/g		0.5	<0.5	<0.5	0.05	<0.05	0.5	<0.5	<0.5	<0.5
IACR CCME (Soil)	µg/g		0.6	0.6	0.6	0.6	0.8	0.6	0.8	0.9	0.8
B[a]P TPE (Soil)	µg/g		0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.05	0.05	0.06
EPH C10-C19	µg/g		20	75	75	20	77	20	125	143	74
EPH C19-C32	µg/g		20	81	73	20	76	20	118	126	78
LEPH C10-C19	µg/g		20	74	73	20	75	20	122	141	73
HEPH C19-C32	µg/g		20	81	73	20	76	20	118	125	78
Benzo(b+j)fluoranthene	µg/g		0.05	<0.05	<0.05	0.05	0.05	0.05	0.05	0.06	0.05

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Certificate of Analysis

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:	03834-05	03834-06	03834-07	03834-09	03834-10	03835-01
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21
Surrogate	Unit	Acceptable Limits	8590421	8590423	8590427	8590432	8590434	8590466
Naphthalene - d8	%	50-130	80	91	81	91	99	90
2-Fluorobiphenyl	%	50-130	70	79	75	79	89	79
P-Terphenyl - d14	%	60-130	92	99	98	99	107	102

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Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03835-02	03835-04	03835-10		03835-12	03840-03	03840-05	03840-06
		SAMPLE TYPE:		Soil	Soil	Soil		Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-21	2017-07-21	2017-07-22		2017-07-22	2017-07-20	2017-07-21	2017-07-21
Parameter	Unit	G / S	RDL	8590469	8590477	8590483	RDL	8590485	8590500	8590502	8590503
Naphthalene	µg/g		0.05	1.46	0.92	0.46	0.005	0.841	0.019	<0.005	0.021
2-Methylnaphthalene	µg/g		0.05	2.29	1.38	1.17	0.005	1.56	0.183	<0.005	<0.005
1-Methylnaphthalene	µg/g		0.05	1.67	0.96	0.81	0.005	1.13	0.113	<0.005	0.054
Acenaphthylene	µg/g		0.05	<0.05	<0.05	<0.05	0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthene	µg/g		0.05	<0.05	<0.05	<0.05	0.005	<0.005	<0.005	<0.005	<0.005
Fluorene	µg/g		0.2	0.2	<0.2	<0.2	0.02	0.19	0.04	<0.02	<0.02
Phenanthrene	µg/g		0.2	0.5	0.3	0.4	0.02	0.51	0.18	<0.02	0.04
Anthracene	µg/g		0.04	<0.04	<0.04	<0.04	0.004	<0.004	<0.004	<0.004	<0.004
Fluoranthene	µg/g		0.01	0.05	0.03	0.05	0.01	0.05	0.01	<0.01	<0.01
Pyrene	µg/g		0.01	0.08	0.05	0.09	0.01	0.09	0.03	<0.01	0.01
Benzo(a)anthracene	µg/g		0.03	<0.03	<0.03	<0.03	0.03	<0.03	<0.03	<0.03	<0.03
Chrysene	µg/g		0.05	0.11	0.07	0.12	0.05	0.11	0.06	<0.05	<0.05
Benzo(b)fluoranthene	µg/g		0.05	0.05	<0.05	0.06	0.05	0.05	<0.05	<0.05	<0.05
Benzo(j)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	0.03	<0.03	0.04	0.03	0.03	<0.03	<0.03	<0.03
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.005	<0.005	<0.005	0.006	0.005	<0.005	<0.005	<0.005	0.005
Benzo(g,h,i)perylene	µg/g		0.05	0.15	0.09	0.19	0.05	0.20	0.06	<0.05	<0.05
Quinoline	µg/g		0.5	<0.5	<0.5	<0.5	0.05	<0.05	<0.05	<0.05	<0.05
IACR CCME (Soil)	µg/g		0.6	0.8	0.6	0.9	0.6	0.8	0.6	<0.6	<0.6
B[a]P TPE (Soil)	µg/g		0.05	<0.05	<0.05	0.06	0.05	<0.05	<0.05	<0.05	<0.05
EPH C10-C19	µg/g		20	94	68	87	20	79	77	<20	383
EPH C19-C32	µg/g		20	91	65	91	20	76	79	<20	33
LEPH C10-C19	µg/g		20	92	66	86	20	78	76	<20	383
HEPH C19-C32	µg/g		20	91	64	90	20	76	79	<20	33
Benzo(b+j)fluoranthene	µg/g		0.05	0.05	<0.05	0.06	0.05	0.05	<0.05	<0.05	<0.05

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SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:	03835-02	03835-04	03835-10	03835-12	03840-03	03840-05	03840-06
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	2017-07-21	2017-07-21	2017-07-22	2017-07-22	2017-07-20	2017-07-21	2017-07-21
Surrogate	Unit	Acceptable Limits	8590469	8590477	8590483	8590485	8590500	8590502	8590503
Naphthalene - d8	%	50-130	92	84	109	95	79	87	78
2-Fluorobiphenyl	%	50-130	81	75	94	95	76	86	69
P-Terphenyl - d14	%	60-130	101	103	107	103	91	100	106

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		SAMPLE DESCRIPTION:		03840-07	03840-09	03840-11	03841-02	03841-03	03841-04	03841-07	03841-09
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21
Parameter	Unit	G / S	RDL	8590505	8590507	8590509	8590523	8590524	8590527	8590530	8590545
Naphthalene	µg/g		0.005	0.011	<0.005	<0.005	0.008	<0.005	<0.005	<0.005	0.159
2-Methylnaphthalene	µg/g		0.005	0.064	<0.005	<0.005	<0.005	<0.005	0.009	<0.005	0.425
1-Methylnaphthalene	µg/g		0.005	0.055	<0.005	0.020	0.029	0.049	0.013	<0.005	0.272
Acenaphthylene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Fluorene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07
Phenanthrene	µg/g		0.02	0.12	<0.02	0.04	0.03	0.05	0.04	<0.02	0.19
Anthracene	µg/g		0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Fluoranthene	µg/g		0.01	0.02	<0.01	0.01	<0.01	<0.01	0.01	<0.01	0.01
Pyrene	µg/g		0.01	0.05	<0.01	0.03	<0.01	<0.01	0.01	<0.01	0.03
Benzo(a)anthracene	µg/g		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Chrysene	µg/g		0.05	0.05	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(b)fluoranthene	µg/g		0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(j)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.005	<0.005	<0.005	0.009	0.005	0.008	0.006	<0.005	<0.005
Benzo(g,h,i)perylene	µg/g		0.05	0.06	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	0.05
Quinoline	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
IACR CCME (Soil)	µg/g		0.6	0.6	<0.6	0.8	<0.6	0.6	0.6	<0.6	<0.6
B[a]P TPE (Soil)	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EPH C10-C19	µg/g		20	25	<20	<20	304	485	<20	<20	28
EPH C19-C32	µg/g		20	33	20	28	31	42	20	<20	28
LEPH C10-C19	µg/g		20	25	<20	<20	304	485	<20	<20	27
HEPH C19-C32	µg/g		20	33	20	28	31	41	20	<20	28
Benzo(b+j)fluoranthene	µg/g		0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:	03840-07	03840-09	03840-11	03841-02	03841-03	03841-04	03841-07	03841-09
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21
Surrogate	Unit	Acceptable Limits	8590505	8590507	8590509	8590523	8590524	8590527	8590530	8590545
Naphthalene - d8	%	50-130	82	86	85	101	107	87	102	93
2-Fluorobiphenyl	%	50-130	80	86	84	93	101	85	102	92
P-Terphenyl - d14	%	60-130	91	96	96	110	103	96	116	103

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		SAMPLE DESCRIPTION:		03841-12	03842-04	03842-05	03842-08	03843-02	03843-04
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-21	2017-07-22	2017-07-22	2017-07-22	2017-07-22	2017-07-22
Parameter	Unit	G / S	RDL	8590548	8590569	8590572	8590576	8590588	8590591
Naphthalene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.027
2-Methylnaphthalene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.156
1-Methylnaphthalene	µg/g		0.005	<0.005	<0.005	0.006	<0.005	0.019	0.093
Acenaphthylene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthene	µg/g		0.005	0.006	<0.005	0.005	<0.005	<0.005	<0.005
Fluorene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.05
Phenanthrene	µg/g		0.02	0.02	<0.02	0.02	<0.02	0.04	0.14
Anthracene	µg/g		0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Fluoranthene	µg/g		0.01	<0.01	<0.01	<0.01	<0.01	0.03	0.01
Pyrene	µg/g		0.01	<0.01	<0.01	0.01	<0.01	0.06	0.02
Benzo(a)anthracene	µg/g		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Chrysene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.08	<0.05
Benzo(b)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(j)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.005	0.007	<0.005	<0.005	<0.005	0.006	<0.005
Benzo(g,h,i)perylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.09	0.05
Quinoline	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
IACR CCME (Soil)	µg/g		0.6	0.6	<0.6	<0.6	<0.6	0.6	<0.6
B[a]P TPE (Soil)	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EPH C10-C19	µg/g		20	<20	<20	<20	<20	46	29
EPH C19-C32	µg/g		20	23	21	<20	<20	76	34
LEPH C10-C19	µg/g		20	<20	<20	<20	<20	46	28
HEPH C19-C32	µg/g		20	23	21	<20	<20	76	34
Benzo(b+j)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:	03841-12	03842-04	03842-05	03842-08	03843-02	03843-04
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	2017-07-21	2017-07-22	2017-07-22	2017-07-22	2017-07-22	2017-07-22
Surrogate	Unit	Acceptable Limits	8590548	8590569	8590572	8590576	8590588	8590591
Naphthalene - d8	%	50-130	94	91	89	94	77	92
2-Fluorobiphenyl	%	50-130	94	91	89	94	75	93
P-Terphenyl - d14	%	60-130	110	105	101	104	99	106

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8590249-8590368 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
Soil sample is visibly heterogeneous.

8590370 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
Soil sample is visibly heterogeneous.
PAH detection limits increased due to sample matrix interference. Sample extract was diluted.

8590372 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
Soil sample is visibly heterogeneous.

8590381-8590423 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
Soil sample is visibly heterogeneous.
PAH detection limits increased due to sample matrix interference. Sample extract was diluted.

8590427 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
Soil sample is visibly heterogeneous.

8590432-8590483 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
Soil sample is visibly heterogeneous.
PAH detection limits increased due to sample matrix interference. Sample extract was diluted.

8590485-8590591 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
Soil sample is visibly heterogeneous.

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SAMPLING SITE:

SAMPLED BY:

BTEX / VPH (C6-C10) Soil

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03828-03	03828-09	03828-10	03829-03	03829-07	03833-03	03833-06	03834-02
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-21
Parameter	Unit	G / S	RDL	8590250	8590256	8590257	8590288	8590299	8590368	8590372	8590417
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.09	0.13
Ethylbenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.23	0.44
m&p-Xylene	µg/g		0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	0.71	1.30
o-Xylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.33	0.60
Styrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
VPH	µg/g		10	<10	14	<10	<10	<10	<10	59	56
VH	µg/g		10	<10	14	<10	<10	<10	<10	60	58
Total Xylenes	ug/g		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.0	1.9
Surrogate	Unit	Acceptable Limits									
Bromofluorobenzene	%	60-140		98	91	99	95	98	95	113	96
Dibromofluoromethane	%	60-140		104	96	103	98	102	101	124	100
Toluene - d8	%	60-140		106	101	108	103	106	103	131	105

Certified By:

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

BTEX / VPH (C6-C10) Soil

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03835-04	03840-03	03840-08	03840-09	03841-05	03841-07	03841-09	03841-12
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-21	2017-07-20	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21
Parameter	Unit	G / S	RDL	8590477	8590500	8590506	8590507	8590528	8590530	8590545	8590548
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g		0.05	0.22	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	µg/g		0.05	0.27	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
m&p-Xylene	µg/g		0.05	0.76	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
o-Xylene	µg/g		0.05	0.38	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
VPH	µg/g		10	29	<10	<10	<10	<10	<10	14	<10
VH	µg/g		10	31	<10	<10	<10	<10	<10	14	<10
Total Xylenes	ug/g		0.1	1.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate	Unit	Acceptable Limits									
Bromofluorobenzene	%	60-140		97	99	93	95	99	99	94	98
Dibromofluoromethane	%	60-140		100	102	97	101	102	102	107	107
Toluene - d8	%	60-140		105	106	99	102	105	99	108	106

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Certificate of Analysis

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

BTEX / VPH (C6-C10) Soil

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03842-08	03842-11	03843-02
		SAMPLE TYPE:		Soil	Soil	Soil
		DATE SAMPLED:		2017-07-22	2017-07-22	2017-07-22
Parameter	Unit	G / S	RDL	8590576	8590581	8590588
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1	<0.1	<0.1
Benzene	µg/g		0.02	<0.02	<0.02	<0.02
Toluene	µg/g		0.05	<0.05	<0.05	<0.05
Ethylbenzene	µg/g		0.05	<0.05	<0.05	<0.05
m&p-Xylene	µg/g		0.05	<0.05	<0.05	<0.05
o-Xylene	µg/g		0.05	<0.05	<0.05	<0.05
Styrene	µg/g		0.05	<0.05	<0.05	<0.05
VPH	µg/g		10	<10	<10	<10
VH	µg/g		10	<10	<10	<10
Total Xylenes	ug/g		0.1	<0.1	<0.1	<0.1
Surrogate	Unit	Acceptable Limits				
Bromofluorobenzene	%	60-140		96	95	95
Dibromofluoromethane	%	60-140		103	101	103
Toluene - d8	%	60-140		106	104	105

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8590250-8590588 Results are based on dry weight of sample.
VPH results have been corrected for BTEX contributions.

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AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

BTEX / VPH (C6-C10) Water

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03815-01	03815-03	03815-04	03816-01	03816-02	03816-03	03816-05	03816-06
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-20	2017-07-20	2017-07-20	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21
Parameter	Unit	G / S	RDL	8590011	8590015	8590019	8590033	8590124	8590128	8590146	8590147
Methyl tert-butyl ether (MTBE)	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Benzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	0.8
Toluene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
m&p-Xylene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	1.3
o-Xylene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	0.7
Styrene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
VPH	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
VH	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
Total Xylenes	ug/L		1	<1	<1	<1	<1	<1	<1	2	2
Surrogate	Unit	Acceptable Limits									
Bromofluorobenzene	%	70-130		94	101	100	99	97	98	89	97
Dibromofluoromethane	%	70-130		100	99	102	102	99	96	101	97
Toluene - d8	%	70-130		101	110	101	100	107	99	102	101

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8590011-8590147 VPH results have been corrected for BTEX contributions.

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Certificate of Analysis

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

CCME F2-F4 (Water)

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

SAMPLE DESCRIPTION:				03815-05	03816-02	03816-05	03816-06
SAMPLE TYPE:				Water	Water	Water	Water
DATE SAMPLED:				2017-07-20	2017-07-21	2017-07-21	2017-07-21
Parameter	Unit	G / S	RDL	8590020	8590124	8590146	8590147
F2 (C10-C16)	µg/L		100	<100	<100	<100	<100
F3 (C16-C34)	µg/L		100	<100	<100	230	190
F4 (C34-C50)	µg/L		100	<100	<100	<100	<100

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8590020-8590147 The C10 - C16 (F2), C16 - C34 (F3), and C34 - C50 (F4) fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Quality control data is available upon request.
Assistance in the interpretation of data is available upon request.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
The chromatogram has returned to baseline by the retention time of nC50.
Extraction and holding times were met for this sample.

Certified By:

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AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Glycols Analysis in Soil

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03828-02	03828-03	03828-06	03828-10	03829-03	03829-07
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20
Parameter	Unit	G / S	RDL	8590249	8590250	8590253	8590257	8590288	8590299
Propylene Glycol	mg/kg		10	<10	<10	<10	<10	<10	<10
Monoethylene Glycol	mg/kg		10	<10	<10	<10	<10	<10	<10
Diethylene Glycol	mg/kg		10	<10	<10	<10	<10	<10	<10
Triethylene Glycol	mg/kg		10	<10	<10	<10	<10	<10	<10
Tetraethylene Glycol	mg/kg		10	<10	<10	<10	<10	<10	<10
Surrogate	Unit	Acceptable Limits							
Heptanol	%	50-150		72	95	99	97	110	109

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8590249-8590299 Analysis by GC/FID.
Results are based on the dry weight of the sample.
Analysis performed at AGAT Calgary.

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Water Low Level

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03815-01	03815-02	03815-03	03815-04	03815-05
		SAMPLE TYPE:		Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20
Parameter	Unit	G / S	RDL	8590011	8590013	8590015	8590019	8590020
Naphthalene	µg/L		0.05	0.06	<0.05	<0.05	<0.05	0.05
Quinoline	µg/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Acenaphthene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Fluorene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Phenanthrene	µg/L		0.04	<0.04	<0.04	<0.04	<0.04	0.09
Anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acridine	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Pyrene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(a)anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	0.01
Benzo(b)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(j)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenzo(a,h)anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	0.01
1-Methylnaphthalene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	0.06
2-Methylnaphthalene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	0.08
EPH C10-C19	µg/L		100	<100	<100	<100	<100	<100
EPH C19-C32	µg/L		100	<100	<100	<100	<100	<100
LEPH C10-C19	µg/L		100	<100	<100	<100	<100	<100
HEPH C19-C32	µg/L		100	<100	<100	<100	<100	<100
Benzo(b+j)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Surrogate	Unit	Acceptable Limits						
Naphthalene - d8	%	50-130		75	73	86	81	75
2-Fluorobiphenyl	%	50-130		76	74	86	81	74
P-Terphenyl - d14	%	60-130		73	66	87	82	70

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Water Low Level

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8590011 LEPH & HEPH results have been corrected for PAH contributions.

8590013-8590020 LEPH & HEPH results have been corrected for PAH contributions.

Certified By:

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ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works PAH in Water Low Level

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03816-01	03816-02	03816-03	03816-04	03816-05	03816-06
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21
Parameter	Unit	G / S	RDL	8590033	8590124	8590128	8590131	8590146	8590147
Naphthalene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	0.65	0.72
Quinoline	µg/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Acenaphthene	µg/L		0.02	<0.02	<0.02	0.03	<0.02	0.02	0.02
Fluorene	µg/L		0.02	<0.02	<0.02	0.03	<0.02	0.02	<0.02
Phenanthrene	µg/L		0.04	<0.04	<0.04	0.12	<0.04	0.14	0.09
Anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acridine	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	0.03	0.02
Pyrene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(a)anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(j)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenzo(a,h)anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1-Methylnaphthalene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	0.42	0.46
2-Methylnaphthalene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	0.46	0.49
Benzo(b+j)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Surrogate	Unit	Acceptable Limits							
Naphthalene - d8	%	50-130		78	80	78	79	64	73
2-Fluorobiphenyl	%	50-130		79	79	77	79	67	73
P-Terphenyl - d14	%	60-130		82	82	80	75	88	90

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Volatile Organic Compounds in Water

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03815-02	03815-05	03816-04
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2017-07-20	2017-07-20	2017-07-21
Parameter	Unit	G / S	RDL	8590013	8590020	8590131
1,1,1,2-Tetrachloroethane	µg/L		1	<1	<1	<1
1,1,1-Trichloroethane	µg/L		1	<1	<1	<1
1,1,2,2-Tetrachloroethane	µg/L		1	<1	<1	<1
1,1,2-Trichloroethane	µg/L		1	<1	<1	<1
1,1-Dichloroethane	µg/L		1	<1	<1	<1
1,1-Dichloroethene	µg/L		1	<1	<1	<1
1,2,3-Trichlorobenzene	µg/L		1	<1	<1	<1
1,2,4-Trichlorobenzene	µg/L		1	<1	<1	<1
Ethylene Dibromide	µg/L		0.3	<0.3	<0.3	<0.3
1,2-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	µg/L		1	<1	<1	<1
1,2-Dichloropropane	µg/L		1	<1	<1	<1
1,3-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5
Bromodichloromethane	µg/L		1	<1	<1	<1
Bromoform	µg/L		1	<1	<1	<1
Bromomethane	µg/L		1	<1	<1	<1
Carbon Tetrachloride	µg/L		0.5	<0.5	<0.5	<0.5
Chlorobenzene	µg/L		1	<1	<1	<1
Dibromochloromethane	µg/L		1	<1	<1	<1
Chloroethane	µg/L		1	<1	<1	<1
Chloroform	µg/L		1	<1	<1	<1
Chloromethane	µg/L		1	<1	<1	<1
cis-1,2-Dichloroethylene	µg/L		1	<1	<1	<1
cis-1,3-Dichloropropene	µg/L		1	<1	<1	<1
Dichlorodifluoromethane	µg/L		1	<1	<1	<1
Dichloromethane	µg/L		1	<1	<1	<1
Hexachlorobutadiene	µg/L		1	<1	<1	<1
Tetrachloroethene	µg/L		1	<1	<1	<1
trans-1,2-Dichloroethylene	µg/L		1	<1	<1	<1

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Certificate of Analysis

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Volatile Organic Compounds in Water

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03815-02	03815-05	03816-04
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2017-07-20	2017-07-20	2017-07-21
Parameter	Unit	G / S	RDL	8590013	8590020	8590131
trans-1,3-Dichloropropene	µg/L		1	<1	<1	<1
Trichloroethene	µg/L		1	<1	<1	<1
Trichlorofluoromethane	µg/L		1	<1	<1	<1
Vinyl Chloride	µg/L		1	<1	<1	<1
VH	µg/L		100	<100	<100	<100
VPH	µg/L		100	<100	<100	<100
Surrogate	Unit	Acceptable Limits				
Bromofluorobenzene	%	70-130		86	90	84
Dibromofluoromethane	%	70-130		87	87	87
Toluene - d8	%	70-130		101	104	101

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03828-02	03828-06	03829-02	03829-06	03829-10	03833-05	03833-10	03834-06
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-21	2017-07-21
Parameter	Unit	G / S	RDL	8590249	8590253	8590275	8590298	8590309	8590370	8590381	8590423
Chloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vinyl Chloride	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromomethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acetone	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Butanone (MEK)	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroform	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
1,2-Dichloropropane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethene	µg/g		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromodichloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4-Methyl-2-pentanone (MIBK)	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Toluene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.11	0.06	0.20
Dibromochloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylene Dibromide	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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Certificate of Analysis

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03828-02	03828-06	03829-02	03829-06	03829-10	03833-05	03833-10	03834-06
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-20	2017-07-21	2017-07-21
Parameter	Unit	G / S	RDL	8590249	8590253	8590275	8590298	8590309	8590370	8590381	8590423
Chlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.22	0.23	0.38
m&p-Xylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.66	0.66	1.05
Bromoform	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
o-Xylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.31	0.31	0.50
1,3-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
VH	µg/g		10	<10	<10	16	12	12	33	33	40
VPH	µg/g		10	<10	<10	16	12	12	32	32	38
Total Xylenes	µg/g		0.2	<0.2	<0.2	<0.2	<0.2	<0.2	1.0	1.0	1.6
Surrogate	Unit	Acceptable Limits									
Bromofluorobenzene	%	60-140		104	103	100	97	97	109	104	90
Dibromofluoromethane	%	60-140		110	89	100	95	95	100	94	89
Toluene - d8	%	60-140		120	104	119	113	112	120	113	105

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ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03834-10	03835-01	03835-12	03840-06	03840-11	03841-02	03841-03	03842-04
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-21	2017-07-21	2017-07-22	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-22
Parameter	Unit	G / S	RDL	8590434	8590466	8590485	8590503	8590509	8590523	8590524	8590569
Chloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vinyl Chloride	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromomethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acetone	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Butanone (MEK)	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroform	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
1,2-Dichloropropane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethene	µg/g		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromodichloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4-Methyl-2-pentanone (MIBK)	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Toluene	µg/g		0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylene Dibromide	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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Certificate of Analysis

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03834-10	03835-01	03835-12	03840-06	03840-11	03841-02	03841-03	03842-04
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-21	2017-07-21	2017-07-22	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-22
Parameter	Unit	G / S	RDL	8590434	8590466	8590485	8590503	8590509	8590523	8590524	8590569
Chlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	µg/g		0.05	0.29	0.14	0.17	<0.05	<0.05	<0.05	<0.05	<0.05
m&p-Xylene	µg/g		0.05	0.93	0.44	0.57	<0.05	<0.05	<0.05	<0.05	<0.05
Bromoform	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
o-Xylene	µg/g		0.05	0.41	0.19	0.26	<0.05	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
VH	µg/g		10	83	38	38	<10	<10	<10	<10	<10
VPH	µg/g		10	82	38	37	<10	<10	<10	<10	<10
Total Xylenes	µg/g		0.2	1.3	0.6	0.8	<0.2	<0.2	<0.2	<0.2	<0.2
Surrogate	Unit	Acceptable Limits									
Bromofluorobenzene	%	60-140		106	94	115	101	112	108	110	106
Dibromofluoromethane	%	60-140		99	91	116	96	103	101	104	106
Toluene - d8	%	60-140		120	108	125	112	121	116	120	121

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ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03843-04
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2017-07-22
Parameter	Unit	G / S	RDL	8590591
Chloromethane	µg/g		0.05	<0.05
Vinyl Chloride	µg/g		0.05	<0.05
Bromomethane	µg/g		0.05	<0.05
Chloroethane	µg/g		0.05	<0.05
Trichlorofluoromethane	µg/g		0.05	<0.05
Acetone	µg/g		0.5	<0.5
1,1-Dichloroethene	µg/g		0.05	<0.05
Dichloromethane	µg/g		0.05	<0.05
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1
2-Butanone (MEK)	µg/g		0.5	<0.5
trans-1,2-Dichloroethene	µg/g		0.05	<0.05
1,1-Dichloroethane	µg/g		0.05	<0.05
cis-1,2-Dichloroethene	µg/g		0.05	<0.05
Chloroform	µg/g		0.05	<0.05
1,2-Dichloroethane	µg/g		0.05	<0.05
1,1,1-Trichloroethane	µg/g		0.05	<0.05
Carbon Tetrachloride	µg/g		0.02	<0.02
Benzene	µg/g		0.02	<0.02
1,2-Dichloropropane	µg/g		0.05	<0.05
Trichloroethene	µg/g		0.01	<0.01
Bromodichloromethane	µg/g		0.05	<0.05
trans-1,3-Dichloropropene	µg/g		0.05	<0.05
4-Methyl-2-pentanone (MIBK)	µg/g		0.5	<0.5
cis-1,3-Dichloropropene	µg/g		0.05	<0.05
1,1,2-Trichloroethane	µg/g		0.05	<0.05
Toluene	µg/g		0.05	<0.05
Dibromochloromethane	µg/g		0.05	<0.05
Ethylene Dibromide	µg/g		0.05	<0.05
Tetrachloroethene	µg/g		0.05	<0.05
1,1,1,2-Tetrachloroethane	µg/g		0.05	<0.05

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03843-04
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2017-07-22
Parameter	Unit	G / S	RDL	8590591
Chlorobenzene	µg/g		0.05	<0.05
Ethylbenzene	µg/g		0.05	<0.05
m&p-Xylene	µg/g		0.05	<0.05
Bromoform	µg/g		0.05	<0.05
Styrene	µg/g		0.05	<0.05
1,1,2,2-Tetrachloroethane	µg/g		0.05	0.13
o-Xylene	µg/g		0.05	<0.05
1,3-Dichlorobenzene	µg/g		0.05	<0.05
1,4-Dichlorobenzene	µg/g		0.05	<0.05
1,2-Dichlorobenzene	µg/g		0.05	<0.05
1,2,4-Trichlorobenzene	µg/g		0.05	<0.05
VH	µg/g		10	<10
VPH	µg/g		10	<10
Total Xylenes	µg/g		0.2	<0.2
Surrogate	Unit	Acceptable Limits		
Bromofluorobenzene	%	60-140		107
Dibromofluoromethane	%	60-140		106
Toluene - d8	%	60-140		122

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8590249-8590591 Results are based on dry weight of sample.

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CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Chloride in Water

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

SAMPLE DESCRIPTION:				03815-03	03815-04		03816-01		03816-03		03816-04
SAMPLE TYPE:				Water	Water		Water		Water		Water
DATE SAMPLED:				2017-07-20	2017-07-20		2017-07-21		2017-07-21		2017-07-21
Parameter	Unit	G / S	RDL	8590015	8590019	RDL	8590033	RDL	8590128	RDL	8590131
Chloride	mg/L		0.05	0.45	0.45	5	1170	0.05	0.38	0.5	414

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

SAMPLE DESCRIPTION:				03815-01	03815-02	03815-03	03815-04		03815-05		03816-01
SAMPLE TYPE:				Water	Water	Water	Water		Water		Water
DATE SAMPLED:				2017-07-20	2017-07-20	2017-07-20	2017-07-20		2017-07-20		2017-07-21
Parameter	Unit	G / S	RDL	8590011	8590013	8590015	8590019	RDL	8590020	RDL	8590033
Aluminum Dissolved	µg/L		2	<2	3	<2	<2	2	54	2	18
Antimony Dissolved	µg/L		0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	0.2	<0.2
Arsenic Dissolved	µg/L		0.1	0.4	0.2	0.1	0.2	0.1	0.4	0.1	<0.1
Barium Dissolved	µg/L		0.2	28.5	109	196	194	2	12500	1.0	623
Beryllium Dissolved	µg/L		0.01	<0.01	0.05	<0.01	<0.01	0.01	0.02	0.01	0.03
Bismuth Dissolved	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.05
Boron Dissolved	µg/L		2	722	307	527	536	2	289	2	138
Cadmium Dissolved	µg/L		0.01	<0.01	0.03	<0.01	<0.01	0.01	0.02	0.01	0.02
Calcium Dissolved	µg/L		50	61200	95200	3100	3060	50	134000	250	370000
Chromium Dissolved	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	0.5	<0.5
Cobalt Dissolved	µg/L		0.05	0.21	1.51	<0.05	<0.05	0.05	0.37	0.05	1.06
Copper Dissolved	µg/L		0.2	0.2	0.4	<0.2	<0.2	0.2	0.4	0.2	<0.2
Iron Dissolved	µg/L		10	114	870	107	105	10	1260	10	58500
Lead Dissolved	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	0.05	0.15	0.05	<0.05
Lithium Dissolved	µg/L		2.5	311	164	184	191	2.5	167	2.5	235
Magnesium Dissolved	µg/L		50	43000	28900	2740	2740	50	48500	50	120000
Manganese Dissolved	µg/L		1	172	1180	33	33	1	1610	1	20800
Mercury Dissolved	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01
Molybdenum Dissolved	µg/L		0.05	0.37	0.14	<0.05	<0.05	0.05	0.13	0.05	<0.05
Nickel Dissolved	µg/L		0.2	0.4	1.4	<0.2	<0.2	0.2	0.6	0.2	1.6
Potassium Dissolved	µg/L		50	2350	2470	768	751	50	2820	50	3220
Selenium Dissolved	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	0.5	<0.5
Silicon Dissolved	µg/L		50	3260	6860	3250	3290	50	4490	50	8100
Silver Dissolved	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.02	<0.02
Sodium Dissolved	µg/L		50	113000	15600	173000	173000	50	38200	50	21900
Strontium Dissolved	µg/L		0.1	1710	960	91.7	95.8	0.1	1830	0.5	2580
Sulphur Dissolved	µg/L		500	27700	8630	<500	<500	500	1860	500	6130
Thallium Dissolved	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01
Tin Dissolved	µg/L		0.05	0.18	0.28	<0.05	<0.05	0.05	0.21	0.05	<0.05
Titanium Dissolved	µg/L		0.5	1.4	2.1	1.4	1.4	0.5	3.3	0.5	2.8

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Certificate of Analysis

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

SAMPLE DESCRIPTION:				03815-01	03815-02	03815-03	03815-04		03815-05		03816-01
SAMPLE TYPE:				Water	Water	Water	Water		Water		Water
DATE SAMPLED:				2017-07-20	2017-07-20	2017-07-20	2017-07-20		2017-07-20		2017-07-21
Parameter	Unit	G / S	RDL	8590011	8590013	8590015	8590019	RDL	8590020	RDL	8590033
Uranium Dissolved	µg/L		0.01	0.11	0.36	<0.01	<0.01	0.01	0.33	0.01	<0.01
Vanadium Dissolved	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	0.5	<0.5
Zinc Dissolved	µg/L		2	<2	6	<2	<2	2	12	2	3
Zirconium Dissolved	µg/L		0.1	0.2	<0.1	<0.1	<0.1	0.1	0.2	0.1	<0.1
Hardness (calc)	ug CaCO3/L		100	330000	357000	19000	18900	100	534000	100	1420000

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SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03816-02		03816-03		03816-04		03816-05	03816-06
		SAMPLE TYPE:		Water		Water		Water		Water	Water
		DATE SAMPLED:		2017-07-21		2017-07-21		2017-07-21		2017-07-21	2017-07-21
Parameter	Unit	G / S	RDL	8590124	RDL	8590128	RDL	8590131	RDL	8590146	8590147
Aluminum Dissolved	µg/L		2	189	2	<2	2	2	2	183	159
Antimony Dissolved	µg/L		0.2	<0.2	0.2	<0.2	0.2	<0.2	0.2	<0.2	<0.2
Arsenic Dissolved	µg/L		0.1	5.6	0.1	1.2	0.1	<0.1	0.1	0.7	0.5
Barium Dissolved	µg/L		0.2	85.2	1.0	879	2	1320	2	652	664
Beryllium Dissolved	µg/L		0.01	0.13	0.01	<0.01	0.01	0.02	0.01	0.03	0.02
Bismuth Dissolved	µg/L		0.05	<0.05	0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05
Boron Dissolved	µg/L		2	97	2	284	2	132	2	41	44
Cadmium Dissolved	µg/L		0.01	0.04	0.01	<0.01	0.01	0.02	0.01	0.08	0.07
Calcium Dissolved	µg/L		50	119000	50	22100	50	162000	50	39000	39400
Chromium Dissolved	µg/L		0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	<0.5
Cobalt Dissolved	µg/L		0.05	0.74	0.05	0.86	0.05	0.49	0.05	4.10	4.24
Copper Dissolved	µg/L		0.2	<0.2	0.2	<0.2	0.2	<0.2	0.2	3.2	3.2
Iron Dissolved	µg/L		10	47700	10	3210	10	17600	10	1110	1070
Lead Dissolved	µg/L		0.05	<0.05	0.05	<0.05	0.05	<0.05	0.05	0.30	0.32
Lithium Dissolved	µg/L		0.5	84.3	2.5	155	2.5	134	0.5	17.6	17.6
Magnesium Dissolved	µg/L		50	39000	50	13600	50	41200	50	12200	12200
Manganese Dissolved	µg/L		1	1180	1	321	1	4740	1	343	343
Mercury Dissolved	µg/L		0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01
Molybdenum Dissolved	µg/L		0.05	0.65	0.05	0.21	0.05	<0.05	0.05	0.24	0.26
Nickel Dissolved	µg/L		0.2	6.7	0.2	0.9	0.2	0.9	0.2	8.4	8.3
Potassium Dissolved	µg/L		50	1950	50	1730	50	2640	50	2630	2630
Selenium Dissolved	µg/L		0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	<0.5
Silicon Dissolved	µg/L		50	8650	50	3540	50	7430	50	3810	3810
Silver Dissolved	µg/L		0.02	<0.02	0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.02
Sodium Dissolved	µg/L		50	19100	50	95800	50	14700	50	3500	3450
Strontium Dissolved	µg/L		0.1	320	0.1	654	0.1	1460	0.1	121	116
Sulphur Dissolved	µg/L		500	102000	500	<500	500	2630	500	1980	1950
Thallium Dissolved	µg/L		0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	0.01	<0.01
Tin Dissolved	µg/L		0.05	<0.05	0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05
Titanium Dissolved	µg/L		0.5	1.6	0.5	1.4	0.5	1.8	0.5	6.7	5.4

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Certificate of Analysis

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03816-02		03816-03		03816-04		03816-05	03816-06
		SAMPLE TYPE:		Water		Water		Water		Water	Water
		DATE SAMPLED:		2017-07-21		2017-07-21		2017-07-21		2017-07-21	2017-07-21
Parameter	Unit	G / S	RDL	8590124	RDL	8590128	RDL	8590131	RDL	8590146	8590147
Uranium Dissolved	µg/L		0.01	0.82	0.01	0.04	0.01	0.01	0.01	0.19	0.18
Vanadium Dissolved	µg/L		0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	1.1	1.1
Zinc Dissolved	µg/L		2	101	2	<2	2	2	2	10	11
Zirconium Dissolved	µg/L		0.1	<0.1	0.1	0.1	0.1	<0.1	0.1	1.0	1.0
Hardness (calc)	ug CaCO3/L		100	458000	100	111000	100	574000	100	148000	149000

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
AGAT WORK ORDER: 17N242036
PROJECT: 1657709.5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

Soil Analysis

RPT Date: Aug 04, 2017

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Public Works Metals in Soil															
Aluminum	8590253		16100	15700	2.9%	< 10	120%	70%	130%	104%	90%	110%			
Antimony	8590253		0.6	0.6	10.1%	< 0.1	99%	70%	130%	95%	90%	110%			
Arsenic	8590253		12.3	14.5	16.5%	< 0.1	114%	70%	130%	100%	90%	110%			
Barium	8590253		406	395	2.8%	< 0.5	122%	70%	130%	99%	90%	110%			
Beryllium	8590253		0.9	1.0	5.9%	< 0.1	101%	70%	130%	99%	90%	110%			
Bismuth	8590253		<0.5	<0.5	NA	< 0.5				98%	85%	115%			
Cadmium	8590253		0.22	0.20	9.2%	< 0.01	112%	70%	130%	96%	90%	110%			
Calcium	8590253		3180	3070	3.6%	< 10	130%	70%	130%	105%	90%	110%			
Chromium	8590253		23	27	18.3%	< 1	110%	70%	130%	110%	90%	110%			
Cobalt	8590253		12.8	13.4	4.9%	< 0.1	108%	70%	130%	107%	90%	110%			
Copper	8590253		28.7	35.5	21.2%	< 0.2	103%	70%	130%	108%	90%	110%			
Iron	8590253		32300	32000	0.9%	< 10	123%	70%	130%	106%	90%	110%			
Lead	8590253		13.7	14.5	5.4%	< 0.1	90%	70%	130%	103%	90%	110%			
Lithium	8590253		14.8	14.9	0.5%	< 0.5				96%	85%	115%			
Magnesium	8590253		4160	3980	4.3%	< 10	124%	70%	130%	102%	90%	110%			
Manganese	8590253		459	537	15.8%	< 1	124%	70%	130%	98%	90%	110%			
Mercury	8590253		0.05	0.06	15.2%	< 0.01	82%	70%	130%	104%	90%	110%			
Molybdenum	8590253		2.1	2.3	9.0%	< 0.2	109%	70%	130%	98%	90%	110%			
Nickel	8590253		33.2	43.9	27.8%	< 0.5	110%	70%	130%	110%	90%	110%			
Phosphorus	8590253		798	790	1.0%	< 5	130%	70%	130%	105%	90%	110%			
Potassium	8590253		2140	2040	4.6%	< 5	125%	70%	130%	103%	90%	110%			
Selenium	8590253		1.0	1.0	4.2%	< 0.1				94%	90%	110%			
Silver	8590253		<0.5	<0.5	NA	< 0.5	96%	70%	130%	99%	90%	110%			
Sodium	8590253		111	107	3.7%	< 5	98%	70%	130%	103%	90%	110%			
Strontium	8590253		38	40	5.9%	< 1	109%	70%	130%	99%	90%	110%			
Thallium	8590253		0.2	0.2	NA	< 0.1	130%	70%	130%	96%	90%	110%			
Tin	8590253		0.6	0.5	NA	< 0.2	87%	70%	130%	98%	90%	110%			
Titanium	8590253		95	71	29.2%	< 1	116%	70%	130%	104%	90%	110%			
Uranium	8590253		1.2	1.3	7.5%	< 0.2	98%	70%	130%	101%	90%	110%			
Vanadium	8590253		41	49	17.1%	< 1	113%	70%	130%	103%	90%	110%			
Zinc	8590253		103	129	21.8%	< 1	105%	70%	130%	98%	90%	110%			
Zirconium	8590253		4.1	4.4	7.4%	< 0.1			130%	103%	90%	110%			
pH 1:2	8590253		5.53	5.60	1.3%		97%	90%	110%	100%	95%	105%			

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Soil Salinity - Na & Cl												
Chloride, Soluble	8590359	IH20161	1330	1440	7.9%	< 2	90%	80%	120%	114%	85%	115%
Sodium, Soluble	1859035	IH20161	604	611	1.2%	< 2	102%	80%	120%	103%	85%	115%
Saturation Percentage	8590359	IH20161	39.6	41.3	4.2%		99%	80%	120%			

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Quality Assurance

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AGAT WORK ORDER: 17N242036
PROJECT: 1657709.5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

Soil Analysis (Continued)

RPT Date: Aug 04, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
(SWEP) Metals															
Arsenic - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	86%	80%	120%	115%	80%	120%	108%	80%	120%
Barium - Leachate (SWEP)	8738785		1.0	1.1	NA	< 0.5	92%	80%	120%	111%	80%	120%	NA	80%	120%
Boron - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	77%	80%	120%	101%	80%	120%	NA	80%	120%
Cadmium - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	91%	80%	120%	104%	80%	120%	103%	80%	120%
Chromium - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	92%	80%	120%	106%	80%	120%	104%	80%	120%
Copper - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	92%	80%	120%	108%	80%	120%	108%	80%	120%
Lead - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	91%	80%	120%	101%	80%	120%	100%	80%	120%
Mercury - Leachate (SWEP)	8738785		<0.1	<0.1	NA	< 0.1	96%	80%	120%	97%	80%	120%	108%	80%	120%
Selenium - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	84%	80%	120%	118%	80%	120%	109%	80%	120%
Silver - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	89%	80%	120%	93%	80%	120%	93%	80%	120%
Uranium - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	92%	80%	120%	97%	80%	120%	98%	80%	120%
Zinc - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	92%	80%	120%	109%	80%	120%	106%	80%	120%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.
With multi element scans it is acceptable for a maximum of 10% (including non-reported elements) of each QC criteria to fail to an absolute maximum of 10%.

Certified By:

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
AGAT WORK ORDER: 17N242036
PROJECT: 1657709.5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis

RPT Date: Aug 04, 2017

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Public Works LEPH/HEPH in Water Low Level															
Naphthalene	67600	W-MS1	0.43	0.41	4.8%	< 0.05	100%	80%	120%				87%	50%	130%
Quinoline	67600	W-MS1	0.5	0.6	18.2%	< 0.1	100%	80%	120%				116%	50%	130%
Acenaphthylene	67600	W-MS1	0.43	0.40	7.2%	< 0.02	101%	80%	120%				87%	50%	130%
Acenaphthene	67600	W-MS1	0.47	0.44	6.6%	< 0.02	100%	80%	120%				94%	50%	130%
Fluorene	67600	W-MS1	0.45	0.42	6.9%	< 0.02	100%	80%	120%				91%	50%	130%
Phenanthrene	67600	W-MS1	0.43	0.41	4.8%	< 0.04	99%	80%	120%				86%	60%	130%
Anthracene	67600	W-MS1	0.44	0.42	4.7%	< 0.01	101%	80%	120%				89%	60%	130%
Acridine	67600	W-MS1	0.57	0.61	6.8%	< 0.05	100%	80%	120%				115%	50%	130%
Fluoranthene	67600	W-MS1	0.44	0.42	4.7%	< 0.02	100%	80%	120%				89%	60%	130%
Pyrene	67600	W-MS1	0.46	0.44	4.4%	< 0.02	100%	80%	120%				94%	60%	130%
Benzo(a)anthracene	67600	W-MS1	0.38	0.40	5.1%	< 0.01	100%	80%	120%				77%	60%	130%
Chrysene	67600	W-MS1	0.42	0.44	4.7%	< 0.01	100%	80%	120%				85%	60%	130%
Benzo(b)fluoranthene	67600	W-MS1	0.40	0.40	0.0%	< 0.01	98%	80%	120%				80%	60%	130%
Benzo(j)fluoranthene	67600	W-MS1	0.48	0.48	0.0%	< 0.01	97%	80%	120%				97%	60%	130%
Benzo(k)fluoranthene	67600	W-MS1	0.38	0.39	2.6%	< 0.01	105%	80%	120%				77%	60%	130%
Benzo(a)pyrene	67600	W-MS1	0.38	0.38	0.0%	< 0.01	101%	80%	120%				77%	60%	130%
Indeno(1,2,3-c,d)pyrene	67600	W-MS1	0.38	0.37	2.7%	< 0.01	100%	80%	120%				78%	60%	130%
Dibenzo(a,h)anthracene	67600	W-MS1	0.41	0.39	5.0%	< 0.01	99%	80%	120%				83%	60%	130%
Benzo(g,h,i)perylene	67600	W-MS1	0.41	0.40	2.5%	< 0.01	100%	80%	120%				83%	60%	130%
1-Methylnaphthalene	67600	W-MS1	0.42	0.40	4.9%	< 0.05	100%	80%	120%				84%	50%	130%
2-Methylnaphthalene	67600	W-MS1	0.39	0.38	2.6%	< 0.05	100%	80%	120%				80%	50%	130%
EPH C10-C19	67601	W-MS1	9040	9770	7.8%	< 100	104%	70%	130%				86%	70%	130%
EPH C19-C32	67601	W-MS1	15100	16700	10.1%	< 100	99%	70%	130%				90%	70%	130%
Naphthalene - d8	67600	W-MS1	83	72	14.2%		102%	80%	120%				84%	50%	130%
2-Fluorobiphenyl	67600	W-MS1	86	74	15.0%		102%	80%	120%				86%	50%	130%
P-Terphenyl - d14	67600	W-MS1	82	72	13.0%		100%	80%	120%				83%	60%	130%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Public Works Volatile Organic Compounds in Water															
1,1,1,2-Tetrachloroethane	67589	8582904	<1	<1	NA	< 1	100%	80%	120%				96%	70%	130%
1,1,1-Trichloroethane	67589	8582904	<1	<1	NA	< 1	99%	80%	120%				102%	70%	130%
1,1,2,2-Tetrachloroethane	67589	8582904	<1	<1	NA	< 1	100%	80%	120%				94%	70%	130%
1,1,2-Trichloroethane	67589	8582904	<1	<1	NA	< 1	99%	80%	120%				95%	70%	130%
1,1-Dichloroethane	67589	8582904	<1	<1	NA	< 1	95%	80%	120%				102%	70%	130%
1,1-Dichloroethene	67589	8582904	<1	<1	NA	< 1	98%	80%	120%				116%	70%	130%
1,2,3-Trichlorobenzene	67589	8582904	<1	<1	NA	< 1	101%	80%	120%				102%	70%	130%
1,2,4-Trichlorobenzene	67589	8582904	<1	<1	NA	< 1	101%	80%	120%				104%	70%	130%
Ethylene Dibromide	67589	8582904	<0.3	<0.3	NA	< 0.3	100%	80%	120%				98%	70%	130%
1,2-Dichlorobenzene	67589	8582904	<0.5	<0.5	NA	< 0.5	100%	80%	120%				100%	70%	130%

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Quality Assurance

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SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Aug 04, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
1,2-Dichloroethane	67589	8582904	<1	<1	NA	< 1	99%	80%	120%				100%	70%	130%
1,2-Dichloropropane	67589	8582904	<1	<1	NA	< 1	99%	80%	120%				101%	70%	130%
1,3-Dichlorobenzene	67589	8582904	<0.5	<0.5	NA	< 0.5	99%	80%	120%				100%	70%	130%
1,4-Dichlorobenzene	67589	8582904	<0.5	<0.5	NA	< 0.5	99%	80%	120%				100%	70%	130%
Bromodichloromethane	67589	8582904	<1	<1	NA	< 1	100%	80%	120%				98%	70%	130%
Bromoform	67589	8582904	<1	<1	NA	< 1	102%	80%	120%				95%	70%	130%
Bromomethane	67589	8582904	<1	<1	NA	< 1	98%	80%	120%				97%	70%	130%
Carbon Tetrachloride	67589	8582904	<0.5	<0.5	NA	< 0.5	100%	80%	120%				103%	70%	130%
Chlorobenzene	67589	8582904	<1	<1	NA	< 1	99%	80%	120%				98%	70%	130%
Dibromochloromethane	67589	8582904	<1	<1	NA	< 1	101%	80%	120%				95%	70%	130%
Chloroethane	67589	8582904	<1	<1	NA	< 1	98%	80%	120%				106%	70%	130%
Chloroform	67589	8582904	<1	<1	NA	< 1	99%	80%	120%				101%	70%	130%
Chloromethane	67589	8582904	<1	<1	NA	< 1	96%	80%	120%				108%	70%	130%
cis-1,2-Dichloroethylene	67589	8582904	<1	<1	NA	< 1	99%	80%	120%				99%	70%	130%
cis-1,3-Dichloropropene	67589	8582904	<1	<1	NA	< 1	101%	80%	120%				97%	70%	130%
Dichlorodifluoromethane	67589	8582904	<1	<1	NA	< 1	99%	80%	120%				120%	70%	130%
Dichloromethane	67589	8582904	<1	<1	NA	< 1	99%	80%	120%				96%	70%	130%
Hexachlorobutadiene	67589	8582904	<1	<1	NA	< 1	100%	80%	120%				105%	70%	130%
Tetrachloroethene	67589	8582904	<1	<1	NA	< 1	99%	80%	120%				80%	70%	130%
trans-1,2-Dichloroethylene	67589	8582904	<1	<1	NA	< 1	98%	80%	120%				107%	70%	130%
trans-1,3-Dichloropropene	67589	8582904	<1	<1	NA	< 1	101%	80%	120%				98%	70%	130%
Trichloroethene	67589	8582904	<1	<1	NA	< 1	99%	80%	120%				102%	70%	130%
Trichlorofluoromethane	67589	8582904	<1	<1	NA	< 1	98%	80%	120%				108%	70%	130%
Vinyl Chloride	67589	8582904	<1	<1	NA	< 1	97%	80%	120%				100%	70%	130%
Bromofluorobenzene	67589	8582904	87	84	3.5%		118%	70%	130%				93%	70%	130%
Dibromofluoromethane	67589	8582904	87	85	2.3%		101%	70%	130%				81%	70%	130%
Toluene - d8	67589	8582904	103	99	4.0%		105%	70%	130%				84%	70%	130%
VH	67589	8582904	<100	<100	NA	< 100									
VPH	67589	8582904	<100	<100	NA	< 100									

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

BTEX / VPH (C6-C10) Water															
Methyl tert-butyl ether (MTBE)	67589	8586638	<1	<1	NA	< 1	94%	80%	120%				98%	70%	130%
Benzene	67589	8586638	1.0	1.0	NA	< 0.5	99%	80%	120%				99%	70%	130%
Toluene	67589	8586638	<0.5	<0.5	NA	< 0.5	104%	80%	120%				91%	70%	130%
Ethylbenzene	67589	8586638	0.8	0.8	NA	< 0.5	99%	80%	120%				103%	70%	130%
m&p-Xylene	67589	8586638	0.8	0.8	NA	< 0.5	99%	80%	120%				101%	70%	130%
o-Xylene	67589	8586638	<0.5	<0.5	NA	< 0.5	101%	80%	120%				98%	70%	130%
Styrene	67589	8586638	<0.5	<0.5	NA	< 0.5	101%	80%	120%				104%	70%	130%
VPH	67589	8586638	<100	<100	NA	< 100									

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Trace Organics Analysis (Continued)

RPT Date: Aug 04, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
VH	67589	8586638	<100	<100	NA	< 100									
Bromofluorobenzene	67589	8586638	85	99	15.2%		109%	70%	130%				108%	70%	130%
Dibromofluoromethane	67589	8586638	102	102	0.0%		97%	70%	130%				105%	70%	130%
Toluene - d8	67589	8586638	99	101	2.0%		108%	70%	130%				95%	70%	130%
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
Public Works LEPH/HEPH in Soil Low Level															
Naphthalene	67583	8590477	0.92	1.1	17.8%	< 0.005	101%	80%	120%				98%	50%	130%
2-Methylnaphthalene	67583	8590477	1.38	1.68	19.6%	< 0.005	98%	80%	120%				84%	50%	130%
1-Methylnaphthalene	67583	8590477	0.96	1.18	20.6%	< 0.005	100%	80%	120%				87%	50%	130%
Acenaphthylene	67583	8590477	<0.05	<0.05	NA	< 0.005	99%	80%	120%				88%	50%	130%
Acenaphthene	67583	8590477	<0.05	<0.05	NA	< 0.005	100%	80%	120%				88%	50%	130%
Fluorene	67583	8590477	<0.2	<0.2	NA	< 0.02	99%	80%	120%				93%	50%	130%
Phenanthrene	67583	8590477	0.37	0.36	2.7%	< 0.02	101%	80%	120%				80%	60%	130%
Anthracene	67583	8590477	<0.04	<0.04	NA	< 0.004	98%	80%	120%				86%	60%	130%
Fluoranthene	67583	8590477	0.03	0.03	NA	< 0.01	100%	80%	120%				85%	60%	130%
Pyrene	67583	8590477	0.05	0.05	0.0%	< 0.01	100%	80%	120%				89%	60%	130%
Benzo(a)anthracene	67583	8590477	<0.03	<0.03	NA	< 0.03	100%	80%	120%				87%	60%	130%
Chrysene	67583	8590477	0.07	0.08	NA	< 0.05	99%	80%	120%				90%	60%	130%
Benzo(b)fluoranthene	67583	8590477	<0.05	<0.05	NA	< 0.05	102%	80%	120%				93%	60%	130%
Benzo(j)fluoranthene	67583	8590477	<0.05	<0.05	NA	< 0.05	101%	80%	120%				99%	60%	130%
Benzo(k)fluoranthene	67583	8590477	<0.05	<0.05	NA	< 0.05	97%	80%	120%				89%	60%	130%
Benzo(a)pyrene	67583	8590477	<0.03	<0.03	NA	< 0.03	101%	80%	120%				89%	60%	130%
Indeno(1,2,3-c,d)pyrene	67583	8590477	<0.02	<0.02	NA	< 0.02	100%	80%	120%				76%	60%	130%
Dibenzo(a,h)anthracene	67583	8590477	<0.005	<0.005	NA	< 0.005	100%	80%	120%				81%	60%	130%
Benzo(g,h,i)perylene	67583	8590477	0.09	0.08	NA	< 0.05	100%	80%	120%				80%	60%	130%
Quinoline	67583	8590477	<0.05	<0.05	NA	< 0.05	100%	80%	120%				107%	50%	130%
IACR CCME (Soil)	67583	8590477	0.6	0.6	NA	< 0.6									
B[a]P TPE (Soil)	67583	8590477	<0.05	<0.05	NA	< 0.05									
EPH C10-C19	67583	8590477	68	63	NA	< 20	104%	70%	130%				96%	65%	120%
EPH C19-C32	67583	8590477	65	60	NA	< 20	102%	70%	130%				94%	80%	120%
Naphthalene - d8	67583	8590477	84	86	2.4%		99%	80%	120%				87%	50%	130%
2-Fluorobiphenyl	67583	8590477	75	73	2.7%		101%	80%	120%				88%	50%	130%
P-Terphenyl - d14	67583	8590477	103	84	20.3%		100%	80%	120%				88%	60%	130%
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
Public Works LEPH/HEPH in Soil Low Level															
Naphthalene	67586	8590569	<0.005	<0.005	NA	< 0.005	100%	80%	120%				104%	50%	130%
2-Methylnaphthalene	67586	8590569	<0.005	<0.005	NA	< 0.005	100%	80%	120%				96%	50%	130%
1-Methylnaphthalene	67586	8590569	<0.005	<0.005	NA	< 0.005	100%	80%	120%				100%	50%	130%

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Trace Organics Analysis (Continued)

RPT Date: Aug 04, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Acenaphthylene	67586	8590569	<0.005	<0.005	NA	< 0.005	101%	80%	120%				101%	50%	130%
Acenaphthene	67586	8590569	<0.005	<0.005	NA	< 0.005	102%	80%	120%				110%	50%	130%
Fluorene	67586	8590569	<0.02	<0.02	NA	< 0.02	100%	80%	120%				104%	50%	130%
Phenanthrene	67586	8590569	<0.02	<0.02	NA	< 0.02	100%	80%	120%				92%	60%	130%
Anthracene	67586	8590569	<0.004	<0.004	NA	< 0.004	102%	80%	120%				106%	60%	130%
Fluoranthene	67586	8590569	<0.01	<0.01	NA	< 0.01	100%	80%	120%				101%	60%	130%
Pyrene	67586	8590569	<0.01	<0.01	NA	< 0.01	102%	80%	120%				99%	60%	130%
Benzo(a)anthracene	67586	8590569	<0.03	<0.03	NA	< 0.03	100%	80%	120%				102%	60%	130%
Chrysene	67586	8590569	<0.05	<0.05	NA	< 0.05	100%	80%	120%				102%	60%	130%
Benzo(b)fluoranthene	67586	8590569	<0.05	<0.05	NA	< 0.05	97%	80%	120%				100%	60%	130%
Benzo(j)fluoranthene	67586	8590569	<0.05	<0.05	NA	< 0.05	101%	80%	120%				102%	60%	130%
Benzo(k)fluoranthene	67586	8590569	<0.05	<0.05	NA	< 0.05	101%	80%	120%				101%	60%	130%
Benzo(a)pyrene	67586	8590569	<0.03	<0.03	NA	< 0.03	103%	80%	120%				92%	60%	130%
Indeno(1,2,3-c,d)pyrene	67586	8590569	<0.02	<0.02	NA	< 0.02	100%	80%	120%				95%	60%	130%
Dibenzo(a,h)anthracene	67586	8590569	<0.005	<0.005	NA	< 0.005	100%	80%	120%				94%	60%	130%
Benzo(g,h,i)perylene	67586	8590569	<0.05	<0.05	NA	< 0.05	100%	80%	120%				93%	60%	130%
Quinoline	67586	8590569	<0.05	<0.05	NA	< 0.05	100%	80%	120%				121%	50%	130%
IACR CCME (Soil)	67586	8590569	<0.6	<0.6	NA	< 0.6									
B[a]P TPE (Soil)	67586	8590569	<0.05	<0.05	NA	< 0.05									
EPH C10-C19	67586	8590569	<20	<20	NA	< 20	105%	70%	130%				99%	65%	120%
EPH C19-C32	67586	8590569	21	<20	NA	< 20	105%	70%	130%				95%	80%	120%
Naphthalene - d8	67586	8590569	91	89	2.2%		99%	80%	120%				92%	50%	130%
2-Fluorobiphenyl	67586	8590569	91	89	2.2%		106%	80%	120%				100%	50%	130%
P-Terphenyl - d14	67586	8590569	105	104	1.0%		102%	80%	120%				93%	60%	130%
Volatile Organic Compounds in Soil															
Chloromethane	67583	8590249	<0.05	<0.05	NA	< 0.05	96%	80%	120%				121%	60%	140%
Vinyl Chloride	67583	8590249	<0.05	<0.05	NA	< 0.05	97%	80%	120%				109%	60%	140%
Bromomethane	67583	8590249	<0.05	<0.05	NA	< 0.05	98%	80%	120%				130%	60%	140%
Chloroethane	67583	8590249	<0.05	<0.05	NA	< 0.05	98%	80%	120%				105%	60%	140%
Trichlorofluoromethane	67583	8590249	<0.05	<0.05	NA	< 0.05	98%	80%	120%				92%	70%	130%
Acetone	67583	8590249	<0.5	<0.5	NA	< 0.5	98%	80%	120%				110%	70%	130%
1,1-Dichloroethene	67583	8590249	<0.05	<0.05	NA	< 0.05	98%	80%	120%				98%	70%	130%
Dichloromethane	67583	8590249	<0.05	<0.05	NA	< 0.05	99%	80%	120%				102%	70%	130%
Methyl tert-butyl ether (MTBE)	67583	8590249	<0.1	<0.1	NA	< 0.1	98%	80%	120%				100%	70%	130%
2-Butanone (MEK)	67583	8590249	<0.5	<0.5	NA	< 0.5	99%	80%	120%				105%	70%	130%
trans-1,2-Dichloroethene	67583	8590249	<0.05	<0.05	NA	< 0.05	98%	80%	120%				100%	70%	130%
1,1-Dichloroethane	67583	8590249	<0.05	<0.05	NA	< 0.05	95%	80%	120%				97%	70%	130%
cis-1,2-Dichloroethene	67583	8590249	<0.05	<0.05	NA	< 0.05	99%	80%	120%				99%	70%	130%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
AGAT WORK ORDER: 17N242036
PROJECT: 1657709.5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Aug 04, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Chloroform	67583	8590249	<0.05	<0.05	NA	< 0.05	99%	80%	120%				100%	70%	130%
1,2-Dichloroethane	67583	8590249	<0.05	<0.05	NA	< 0.05	99%	80%	120%				98%	70%	130%
1,1,1-Trichloroethane	67583	8590249	<0.05	<0.05	NA	< 0.05	99%	80%	120%				93%	70%	130%
Carbon Tetrachloride	67583	8590249	<0.02	<0.02	NA	< 0.02	100%	80%	120%				89%	70%	130%
Benzene	67583	8590249	<0.02	<0.02	NA	< 0.02	99%	80%	120%				100%	70%	130%
1,2-Dichloropropane	67583	8590249	<0.05	<0.05	NA	< 0.05	99%	80%	120%				98%	70%	130%
Trichloroethene	67583	8590249	<0.01	<0.01	NA	< 0.01	99%	80%	120%				94%	70%	130%
Bromodichloromethane	67583	8590249	<0.05	<0.05	NA	< 0.05	100%	80%	120%				95%	70%	130%
trans-1,3-Dichloropropene	67583	8590249	<0.05	<0.05	NA	< 0.05	101%	80%	120%				84%	60%	140%
4-Methyl-2-pentanone (MIBK)	67583	8590249	<0.5	<0.5	NA	< 0.5	101%	80%	120%				87%	70%	130%
cis-1,3-Dichloropropene	67583	8590249	<0.05	<0.05	NA	< 0.05	101%	80%	120%				83%	60%	140%
1,1,2-Trichloroethane	67583	8590249	<0.05	<0.05	NA	< 0.05	99%	80%	120%				95%	70%	130%
Toluene	67583	8590249	<0.05	<0.05	NA	< 0.05	99%	80%	120%				98%	70%	130%
Dibromochloromethane	67583	8590249	<0.05	<0.05	NA	< 0.05	101%	80%	120%				88%	70%	130%
Ethylene Dibromide	67583	8590249	<0.05	<0.05	NA	< 0.05	100%	80%	120%				93%	70%	130%
Tetrachloroethene	67583	8590249	<0.05	<0.05	NA	< 0.05	99%	80%	120%				82%	70%	130%
1,1,1,2-Tetrachloroethane	67583	8590249	<0.05	<0.05	NA	< 0.05	100%	80%	120%				93%	70%	130%
Chlorobenzene	67583	8590249	<0.05	<0.05	NA	< 0.05	99%	80%	120%				97%	70%	130%
Ethylbenzene	67583	8590249	<0.05	<0.05	NA	< 0.05	100%	80%	120%				95%	70%	130%
m&p-Xylene	67583	8590249	<0.05	<0.05	NA	< 0.05	99%	80%	120%				96%	70%	130%
Bromoform	67583	8590249	<0.05	<0.05	NA	< 0.05	102%	80%	120%				82%	70%	130%
Styrene	67583	8590249	<0.05	<0.05	NA	< 0.05	101%	80%	120%				90%	70%	130%
1,1,2,2-Tetrachloroethane	67583	8590249	<0.05	<0.05	NA	< 0.05	100%	80%	120%				98%	70%	130%
o-Xylene	67583	8590249	<0.05	<0.05	NA	< 0.05	99%	80%	120%				98%	70%	130%
1,3-Dichlorobenzene	67583	8590249	<0.05	<0.05	NA	< 0.05	99%	80%	120%				93%	70%	130%
1,4-Dichlorobenzene	67583	8590249	<0.05	<0.05	NA	< 0.05	99%	80%	120%				93%	70%	130%
1,2-Dichlorobenzene	67583	8590249	<0.05	<0.05	NA	< 0.05	100%	80%	120%				94%	70%	130%
1,2,4-Trichlorobenzene	67583	8590249	<0.05	<0.05	NA	< 0.05	101%	80%	120%				87%	70%	130%
Bromofluorobenzene	67583	8590249	104	91	13.3%		118%	60%	140%				109%	60%	140%
Dibromofluoromethane	67583	8590249	110	100	9.5%		101%	60%	140%				101%	60%	140%
Toluene - d8	67583	8590249	120	110	8.7%		105%	60%	140%				102%	60%	140%
VH	67583	8590249	<10	<10	NA	< 10									
VPH	67583	8590249	<10	<10	NA	< 10									

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

BTEX / VPH (C6-C10) Soil															
Methyl tert-butyl ether (MTBE)	67577	8590250	<0.1	<0.1	NA	< 0.1	95%	80%	120%				79%	70%	130%
Benzene	67577	8590250	<0.02	<0.02	NA	< 0.02	101%	80%	120%				90%	70%	130%
Toluene	67577	8590250	<0.05	<0.05	NA	< 0.05	100%	80%	120%				97%	70%	130%
Ethylbenzene	67577	8590250	<0.05	<0.05	NA	< 0.05	100%	80%	120%				95%	70%	130%

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
AGAT WORK ORDER: 17N242036
PROJECT: 1657709.5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Aug 04, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
m&p-Xylene	67577	8590250	<0.05	<0.05	NA	< 0.05	100%	80%	120%				95%	70%	130%
o-Xylene	67577	8590250	<0.05	<0.05	NA	< 0.05	100%	80%	120%				96%	70%	130%
Styrene	67577	8590250	<0.05	<0.05	NA	< 0.05	100%	80%	120%				95%	70%	130%
VPH	67577	8590250	<10	<10	NA	< 10									
VH	67577	8590250	<10	<10	NA	< 10									
Bromofluorobenzene	67577	8590250	98	98	0.0%		100%	60%	140%				92%	60%	140%
Dibromofluoromethane	67577	8590250	104	105	1.0%		103%	60%	140%				93%	60%	140%
Toluene - d8	67577	8590250	106	107	0.9%		100%	60%	140%				96%	60%	140%
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
CCME F2-F4 (Water)															
F2 (C10-C16)	67601	W-MS1	6170	6620	7.0%	< 100	100%	80%	120%				86%	70%	130%
F3 (C16-C34)	67601	W-MS1	20500	22700	10.2%	< 100	108%	80%	120%				91%	70%	130%
F4 (C34-C50)	67601	W-MS1	4540	5130	12.2%	< 100	98%	80%	120%				86%	70%	130%
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
Glycols Analysis in Soil															
Propylene Glycol	110	8522307	<10	<10	NA	< 10	100%	70%	130%	98%	70%	130%	97%	60%	140%
Monoethylene Glycol	110	8522307	10	<10	NA	< 10	96%	70%	130%	97%	70%	130%	96%	60%	140%
Diethylene Glycol	110	8522307	<10	<10	NA	< 10	97%	70%	130%	97%	70%	130%	95%	60%	140%
Triethylene Glycol	110	8522307	<10	<10	NA	< 10	94%	70%	130%	95%	70%	130%	92%	60%	140%
Tetraethylene Glycol	110	8522307	<10	<10	NA	< 10	87%	70%	130%	85%	70%	130%	73%	60%	140%
Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.															
Public Works LEPH/HEPH in Soil Low Level															
Naphthalene	67610	8590427	1.08	1.11	2.7%	< 0.005	102%	80%	120%				109%	50%	130%
2-Methylnaphthalene	67610	8590427	1.62	1.69	4.2%	< 0.005	101%	80%	120%				99%	50%	130%
1-Methylnaphthalene	67610	8590427	1.15	1.21	5.1%	< 0.005	102%	80%	120%				103%	50%	130%
Acenaphthylene	67610	8590427	<0.05	<0.05	NA	< 0.005	102%	80%	120%				98%	50%	130%
Acenaphthene	67610	8590427	<0.05	<0.05	NA	< 0.005	103%	80%	120%				99%	50%	130%
Fluorene	67610	8590427	0.18	0.16	11.8%	< 0.02	102%	80%	120%				101%	50%	130%
Phenanthrene	67610	8590427	0.48	0.44	8.7%	< 0.02	99%	80%	120%				86%	60%	130%
Anthracene	67610	8590427	<0.04	<0.04	NA	< 0.004	103%	80%	120%				99%	60%	130%
Fluoranthene	67610	8590427	0.04	0.03	NA	< 0.01	101%	80%	120%				100%	60%	130%
Pyrene	67610	8590427	0.07	0.06	15.4%	< 0.01	102%	80%	120%				104%	60%	130%
Benzo(a)anthracene	67610	8590427	<0.03	<0.03	NA	< 0.03	102%	80%	120%				99%	60%	130%
Chrysene	67610	8590427	0.08	0.08	NA	< 0.05	104%	80%	120%				109%	60%	130%
Benzo(b)fluoranthene	67610	8590427	0.05	<0.05	NA	< 0.05	101%	80%	120%				98%	60%	130%
Benzo(j)fluoranthene	67610	8590427	<0.05	<0.05	NA	< 0.05	103%	80%	120%				106%	60%	130%
Benzo(k)fluoranthene	67610	8590427	<0.05	<0.05	NA	< 0.05	102%	80%	120%				95%	60%	130%

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Aug 04, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Benzo(a)pyrene	67610	8590427	0.03	<0.03	NA	< 0.03	103%	80%	120%				97%	60%	130%
Indeno(1,2,3-c,d)pyrene	67610	8590427	<0.02	<0.02	NA	< 0.02	102%	80%	120%				94%	60%	130%
Dibenzo(a,h)anthracene	67610	8590427	<0.005	0.005	NA	< 0.005	102%	80%	120%				89%	60%	130%
Benzo(g,h,i)perylene	67610	8590427	0.17	0.15	NA	< 0.05	102%	80%	120%				100%	60%	130%
Quinoline	67610	8590427	<0.05	<0.05	NA	< 0.05	102%	80%	120%				101%	50%	130%
IACR CCME (Soil)	67610	8590427	0.8	0.6	NA	< 0.6									
B[a]P TPE (Soil)	67610	8590427	<0.05	<0.05	NA	< 0.05									
EPH C10-C19	67610	8590427	77	73	NA	< 20	105%	70%	130%				94%	65%	120%
EPH C19-C32	67610	8590427	76	76	NA	< 20	105%	70%	130%				92%	80%	120%
LEPH C10-C19	67610	8590427	75	71	NA	< 20		90%	110%		70%	130%		70%	130%
HEPH C19-C32	67610	8590427	76	76	NA	< 20		90%	110%		70%	130%		70%	130%
Naphthalene - d8	67610	8590427	81	79	2.5%		100%	80%	120%				91%	50%	130%
2-Fluorobiphenyl	67610	8590427	75	74	1.3%		101%	80%	120%				92%	50%	130%
P-Terphenyl - d14	67610	8590427	98	93	5.2%		101%	80%	120%				90%	60%	130%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

BTEX / VPH (C6-C10) Soil															
Methyl tert-butyl ether (MTBE)	67622	8590372	<0.1	<0.1	NA	< 0.1	100%	80%	120%				90%	70%	130%
Benzene	67622	8590372	<0.02	<0.02	NA	< 0.02	100%	80%	120%				94%	70%	130%
Toluene	67622	8590372	0.09	0.09	NA	< 0.05	100%	80%	120%				92%	70%	130%
Ethylbenzene	67622	8590372	0.23	0.22	NA	< 0.05	101%	80%	120%				88%	70%	130%
m&p-Xylene	67622	8590372	0.71	0.69	2.9%	< 0.05	101%	80%	120%				89%	70%	130%
o-Xylene	67622	8590372	0.33	0.32	3.1%	< 0.05	101%	80%	120%				90%	70%	130%
Styrene	67622	8590372	<0.05	<0.05	NA	< 0.05	101%	80%	120%				86%	70%	130%
VPH	67622	8590372	59	58	1.7%	< 10									
VH	67622	8590372	60	59	1.7%	< 10									
Bromofluorobenzene	67622	8590372	113	110	2.7%		110%	60%	140%				98%	60%	140%
Dibromofluoromethane	67622	8590372	124	122	1.6%		101%	60%	140%				98%	60%	140%
Toluene - d8	67622	8590372	131	128	2.3%		105%	60%	140%				99%	60%	140%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Certified By:

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Water Analysis

RPT Date: Aug 04, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Public Works Dissolved Metals															
Aluminum Dissolved	8593895		104	104	0.8%	< 2	91%	90%	110%	97%	90%	110%			
Antimony Dissolved	8593895		<0.2	<0.2	NA	< 0.2	108%	90%	110%	101%	90%	110%			
Arsenic Dissolved	8593895		0.3	0.1	NA	< 0.1	109%	90%	110%	103%	90%	110%			
Barium Dissolved	8593895		10.8	11.9	9.4%	< 0.2	106%	90%	110%	101%	90%	110%			
Beryllium Dissolved	8593895		0.07	0.07	4.1%	< 0.01	99%	90%	110%	99%	90%	110%			
Bismuth Dissolved	8593895		0.05	<0.05	NA	< 0.05				103%	90%	110%			
Boron Dissolved	8593895		700	699	0.2%	< 2	102%	90%	110%	105%	90%	110%			
Cadmium Dissolved	8593895		0.06	0.07	7.1%	< 0.01	103%	90%	110%	104%	90%	110%			
Calcium Dissolved	8593895		152000	153000	0.5%	< 50	102%	90%	110%	101%	90%	110%			
Chromium Dissolved	8593895		<0.5	<0.5	NA	< 0.5	94%	90%	110%	100%	90%	110%			
Cobalt Dissolved	8593895		0.56	0.58	3.4%	< 0.05	103%	90%	110%	104%	90%	110%			
Copper Dissolved	8593895		14.5	14.6	0.6%	< 0.2	97%	90%	110%	103%	90%	110%			
Iron Dissolved	8593895		1220	1230	0.6%	< 10	102%	90%	110%	101%	90%	110%			
Lead Dissolved	8593895		<0.05	<0.05	NA	< 0.05	100%	90%	110%	104%	90%	110%			
Lithium Dissolved	8593895		593	623	4.9%	< 0.5				101%	90%	110%			
Magnesium Dissolved	8593895		27200	27300	0.4%	< 50	102%	90%	110%	100%	90%	110%			
Manganese Dissolved	8593895		317	317	NA	< 1	104%	90%	110%	102%	90%	110%			
Mercury Dissolved	8590011		<0.01	<0.01	NA	< 0.01	95%	90%	110%	99%	90%	110%			
Molybdenum Dissolved	8593895		1.54	1.53	0.6%	< 0.05	101%	90%	110%	101%	90%	110%			
Nickel Dissolved	8593895		1.0	1.0	NA	< 0.2	98%	90%	110%	102%	90%	110%			
Potassium Dissolved	8593895		2440	2450	0.4%	< 50	98%	90%	110%	103%	90%	110%			
Selenium Dissolved	8593895		<0.5	<0.5	NA	< 0.5	103%	90%	110%	101%	90%	110%			
Silicon Dissolved	8593895		4120	4380	6.1%	< 50				105%	90%	110%			
Silver Dissolved	8593895		<0.02	<0.02	NA	< 0.02				99%	90%	110%			
Sodium Dissolved	8593895		40800	41000	0.5%	< 50	99%	90%	110%	101%	90%	110%			
Strontium Dissolved	8593895		773	763	1.3%	< 0.1	103%	90%	110%	99%	90%	110%			
Sulphur Dissolved	8593895		138000	137000	0.5%	< 500				102%	90%	110%			
Thallium Dissolved	8593895		0.02	0.02	NA	< 0.01	103%	90%	110%	105%	90%	110%			
Tin Dissolved	8593895		0.08	0.09	NA	< 0.05				102%	90%	110%			
Titanium Dissolved	8593895		1.9	2.6	NA	< 0.5				103%	90%	110%			
Uranium Dissolved	8593895		6.95	7.04	1.3%	< 0.01	96%	90%	110%	101%	90%	110%			
Vanadium Dissolved	8593895		<0.5	<0.5	NA	< 0.5	106%	90%	110%	104%	90%	110%			
Zinc Dissolved	8593895		17	18	6.8%	< 2	101%	90%	110%	102%	90%	110%			
Zirconium Dissolved	8593895		<0.1	<0.1	NA	< 0.1				106%	70%	130%			
Chloride in Water															
Chloride	8590128		0.38	0.37	3.8%	< 0.05	103%	90%	110%	94%	90%	110%			

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

AGAT Laboratories

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date: Aug 04, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Certified By:

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QA Violation

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

ATTENTION TO: Erin O'Brien

RPT Date: Aug 04, 2017

PARAMETER	Sample Id	Sample Description	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
				Lower	Upper		Lower	Upper		Lower	Upper
(SWEP) Metals											
Boron - Leachate (SWEP)		03840-02	77%	80%	120%	101%	80%	120%	NA	80%	120%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.
With multi element scans it is acceptable for a maximum of 10% (including non-reported elements) of each QC criteria to fail to an absolute maximum of 10%.

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Method Summary

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Arsenic - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Barium - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Boron - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Cadmium - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Chromium - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Copper - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Lead - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Mercury - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Selenium - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Silver - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Uranium - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Zinc - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Aluminum	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Antimony	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Arsenic	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Barium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Beryllium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Bismuth	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Cadmium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Calcium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Chromium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Cobalt	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Copper	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Iron	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Lead	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Lithium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Magnesium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Manganese	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP-MS
Mercury	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Molybdenum	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Nickel	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Phosphorus	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Potassium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES

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Method Summary

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AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Selenium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Silver	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Sodium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Strontium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP-MS
Thallium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Tin	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Titanium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Uranium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Vanadium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Zinc	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Zirconium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
pH 1:2	INOR-181-6031	BC MOE Lab Manual B (pH, Electrometric, Soil)	PH METER
Chloride, Soluble	LAB-181-4022, INOR-181-6023	BC MOE Lab Manual Section B	COLORIMETER
Sodium, Soluble	LAB-181-4022, MET-181-6106	BC MOE Lab Manual Section B	ICP/OES
Saturation Percentage	LAB-181-4022	BC MOE Lab Manual Section B	GRAVIMETRIC

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Naphthalene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
2-Methylnaphthalene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
1-Methylnaphthalene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthylene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluorene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Phenanthrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Chrysene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(b)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(j)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(k)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Indeno(1,2,3-c,d)pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Dibenzo(a,h)anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(g,h,i)perylene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Quinoline	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
IACR CCME (Soil)	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
B[a]P TPE (Soil)	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
EPH C10-C19	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
EPH C19-C32	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
LEPH C10-C19	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
HEPH C19-C32	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
Naphthalene - d8	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS

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SAMPLING SITE:

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
2-Fluorobiphenyl	ORG-180-5102	Modified form BCMOE Lab Manual Section D (PAH)	GC/MS
P-Terphenyl - d14	ORG-180-5102	Modified form BCMOE Lab Manual Section D (PAH)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Benzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Toluene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Ethylbenzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
m&p-Xylene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
o-Xylene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Styrene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
VPH	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
VH	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Bromofluorobenzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Dibromofluoromethane	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Toluene - d8	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
Benzene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
Toluene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
Ethylbenzene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
m&p-Xylene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
o-Xylene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
Styrene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
VPH	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
VH	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
Bromofluorobenzene	ORG-180-5130	modified from BC MOE Lab Manual Section D	GC/MS
Dibromofluoromethane	ORG-180-5130	modified from BC MOE Lab Manual Section D	GC/MS
Toluene - d8	ORG-180-5130	modified from BC MOE Lab Manual Section D	GC/MS
F2 (C10-C16)	ORG-180-5134	CCME Tier 1 Method	GC/FID
F3 (C16-C34)	ORG-180-5134	CCME Tier 1 Method	GC/FID
F4 (C34-C50)	ORG-180-5134	CCME Tier 1 Method	GC/FID
Propylene Glycol	TO-1410	EPA SW-846 8015	GC/FID

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Monoethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Diethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Triethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Tetraethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Heptanol	TO-1410	EPA SW-846 8015	GC/FID
Quinoline	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthylene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluorene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Phenanthrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Anthracene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acridine	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Pyrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)anthracene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Chrysene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(b)fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(j)fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(k)fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)pyrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Indeno(1,2,3-c,d)pyrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Dibenzo(a,h)anthracene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(g,h,i)perylene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
1-Methylnaphthalene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
2-Methylnaphthalene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
EPH C10-C19	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
EPH C19-C32	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
LEPH C10-C19	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
HEPH C19-C32	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
Naphthalene - d8			GC/MS
2-Fluorobiphenyl	ORG-180-5133	Modified form BCMOE Lab Manual Section D (PAH)	GC/MS

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
P-Terphenyl - d14	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
1,1,1,2-Tetrachloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
1,1,1-Trichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
1,1,2,2-Tetrachloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
1,1,2-Trichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
1,1-Dichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
1,1-Dichloroethene	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
1,2,3-Trichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2,4-Trichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
Ethylene Dibromide	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
1,2-Dichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
1,2-Dichloropropane	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
1,3-Dichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
1,4-Dichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
Bromodichloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
Bromoform	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
Bromomethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Carbon Tetrachloride	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromochloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroform	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,2-Dichloroethylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,3-Dichloropropene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dichlorodifluoromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
Dichloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS

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SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Hexachlorobutadiene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Tetrachloroethene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,2-Dichloroethylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,3-Dichloropropene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichloroethene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichlorofluoromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Vinyl Chloride	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
Bromofluorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
Dibromofluoromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
Toluene - d8	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
VPH	ORG-180-5130	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Chloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Vinyl Chloride	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromomethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichlorofluoromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Acetone	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dichloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
2-Butanone (MEK)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,2-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,2-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroform	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1-Trichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Carbon Tetrachloride	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS

AGAT Laboratories
Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
AGAT WORK ORDER: 17N242036
PROJECT: 1657709.5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Benzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloropropane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromodichloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,3-Dichloropropene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
4-Methyl-2-pentanone (MIBK)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,3-Dichloropropene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2-Trichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromochloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylene Dibromide	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Tetrachloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1,2-Tetrachloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylbenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
m&p-Xylene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromoform	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Styrene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2,2-Tetrachloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
o-Xylene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,3-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,4-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2,4-Trichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromofluorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromofluoromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene - d8	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
VH	ORG-180-5103	Modified from BC MOE Lab Manual Sec D (VOC)	GC/MS/FID

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
VPH	ORG-180-5103	Modified from BC MOE Lab Manual Sec D (VOC)	GC/MS/FID

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Chloride	INOR-181-6002	Modified from SM 4110 B	ION CHROMATOGRAPH
Aluminum Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Antimony Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Arsenic Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Barium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Beryllium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Bismuth Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Boron Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Cadmium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Calcium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Chromium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Cobalt Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Copper Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Iron Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Lead Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Lithium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Magnesium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Manganese Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Mercury Dissolved	MET-181-6103, LAB-181-4015	Modified from EPA 245.7	CV/AA
Molybdenum Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Nickel Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Potassium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Selenium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Silicon Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Silver Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Sodium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Strontium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Sulphur Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N242036

PROJECT: 1657709.5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Thallium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Tin Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Titanium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Uranium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Vanadium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Zinc Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Zirconium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS

17M242036

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03815 page 1 of 4

Golder Associates

200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709/5000			Laboratory Name: AGAT
Short Title: K19 Alaska Hwy	Golder Contact: Erin O'brien		Address: 120-8600 Glenlyon Parkway, Burnaby, BC
Golder E-mail Address 1: erin_o'brien @golder.com	Golder E-mail Address 2: linda_kemp @golder.com	Telephone/Fax: 778-452-4000	Contact: Maggie Chan

Office Name: Vancouver

EQuIS Facility Code: 2843859
EQuIS upload: ☐

JUL 25 AM 9:18

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Regular (5 Days)
Criteria: ☑ CSR ☑ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	dissolved metals	BTEX/VPH	PAHs/LEPH/HEPH	Chloride	VOCs	Chloride	F2 - F4		RUSH (Select TAT above)	Remarks (over)
03815 - 01	K19-MW17-02		-	WG	20/07/17	09:50	GRAB	-	-	8	X	X	X				8590011			* dissolved metals incl. separate containers for sodium and mercury
- 02	K19-MW17-07		-			11:45		-	-	10	X	X	X		X		013			
- 03	K19-MW16-070		-			15:20		FDA	03815-04	11	X	X	X	X			015			
- 04	K19-MW16-070		-			15:20		FD	03815-03	11	X	X	X	X			019			
03815 - 05	K19-MW17-06		-	WG	20/07/17	15:45	GRAB	-	-	8	X	X	X		X		020			* hold F_2-F_4 collected for 03815-031-04/-02
- 06																				
- 07																				
- 08																				
- 09																				
- 10																				
- 11																				
- 12																				

Sampler's Signature:	Relinquished by: Signature:	Company: Golder	Date: 22-JUL-17	Time: 16 30	Received by: Signature	Company: AGAT	
Comments: Invoice Dave Oggenthorpe	Method of Shipment:	Waybill No.:	Received for Lab by: Scott Sidlo	Date: July 22 17.	Time: 17:20		
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C): -0	Cooler opened by: SS	Date	Time	

WHITE: Golder Copy **YELLOW:** Lab Copy

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17M24 2036

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03816 page 2 of 11

Golder Associates

200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709/5000		Laboratory Name: AGAT	
Short Title: KR Field Investigation	Golder Contact: Erin Oburch	Address: 120-9600 Glenlyon Parkway	
Golder E-mail Address 1: erin_oburch@golder.com	Golder E-mail Address 2: linda_kemp@golder.com	Telephone/Fax: (778) 452-4000	Contact: Maggie Chan

Office Name: Vancouver Virtual Way

EQuIS Facility Code: 28433859
EQuIS upload: ☐

JUL 26 AM 9:19

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Regular (5 Days)
Criteria: ☐ CSR ☒ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	PAH	VHV/BTEX	VOC	Chloride	F2-F4	Dissolved Hg			RUSH (Select TAT above)	Remarks (over)
03816 - 01	KR-09MW-09	1	-	WG	21/07/17	11:46		-	-	9	X	X		X		X			033	* hold F2-F4
- 02	KR-MW16-05	1	-		21/07/17	13:35		-	-	10	X	X				X			124	
- 03	KR-09MW-03	1	-		21/07/17	16:13		-	-	11	X	X		X		X			128	
- 04	KR-10MW-24	1	-		21/07/17	10:35		-	-	8	X	X	X	X		X			131	
- 05	KR10MW10	1	-		21/07/17	12:30		FD	03816-06	10	X	X				X			146	
03816 - 06	KR10MW-10	1	-	WG	21/07/17	12:30		FDA	03816-05	10	X	X				X			147	
- 07																				
- 08																				
- 09																				
- 10																				
- 11																				
- 12																				

Sampler's Signature: Andrew Mc	Relinquished by: Signature	Company Golder	Date 22-JUL-17	Time 16:30	Received by: Signature	Company AGAT
Comments: Invoice Dave Osgu thorpe	Method of Shipment:	Waybill No.:	Received for Lab by:		Date 24 JUL 17	Time 14:20
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C) 8	Cooler opened by:	Date	Time

WHITE: Golder Copy **YELLOW:** Lab Copy

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CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

17N242036
No. 03828 page 3 of 11

Golder Associates
200 - 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709 / 5000
Short Title: K19 Field Inv.
Golder Contact: Erin O'Brien
Golder E-mail Address 1: erin_o'brien @golder.com
Golder E-mail Address 2: linda_kemp @golder.com

Laboratory Name: AGAT
Address: 120-6700 Greenwood Pkwy, Burnaby BC
Telephone/Fax: (778) 452-4000
Contact: Hong-Chan

Office Name: Vancouver - Virtual Way
EQuIS Facility Code: 28433859
EQuIS upload: ☑

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☑ Regular (5 Days)
Criteria: ☑ CSR ☑ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail
Quote No.:

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Analyses Required: Metals	LEPH / HEPH (with D)	BTEX / VPH	VOC	PAH's	Glycols	RUSH (Select TAT above)	Remarks (over)
03828 - 01	K19-TP17-74	1	0.6	SO	20/07/17	0905	Discrete			5	X						859247	
- 02		2	1.6			0915		FDA	03828-03	5	X	X	X	X	X		249	
- 03		2	1.6			0915		FD	03828-02	5			X		X		250	
- 04		3	2.7			0925				3							251	
- 05		4	3.2			0935				5							252	
- 06	K19-TP17-75	1	0.6			1015				5	X	X	X	X	X		253	
- 07		2	1.7			1025				3							254	
- 08		3	2.5			1035				5							255	
- 09		4	3.0			1045				5			X				256	
- 10	K19-TP17-76	1	0.7			1115				5	X		X		X		257	
- 11		2	1.7			1125		FDA	03828-12	3		X					258	
- 12		2	1.7			1125		FD	03828-11	3							259	

Sampler's Signature	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
		Golder	22-JUL-17	16 30		

Comments	Method of Shipment	Waybill No	Received for Lab by:	Date	Time
Invoice Dave Osgathorpe			Scott Belliveau	Jul 27-17	14 20

Shipped by:	Shipment Condition / Seal Intact	Temp (°C)	Cooler opened by	Date	Time
		5			

WHITE: Golder Copy YELLOW: Lab Copy

Jul 26, 2017
9:18
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17N242036

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03829 page 1 of 1

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709 / 5000
Short Title: Kig Field Inv.
Golder Contact: Erin O'Brien
Golder E-mail Address 1: erin_o'brien @golder.com
Golder E-mail Address 2: linda-kemp @golder.com

Laboratory Name: AGAT
Address: 120-8000 Canyon Pkwy Burnaby BC
Telephone/Fax: (778) 452-4000
Contact: Maggie Chan

Office Name: Vancouver - Virtual Wing
EQuIS Facility Code: 28733859
EQuIS upload: ☑

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☑ Regular (5 Days)
Criteria: ☑ CSR ☑ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail
Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Metals	LEPH/HEPH/PAH	BTEX/VPH	VOC	Glycols	RUSH (Select TAT above)	Remarks (over)
03829 - 01	KIG-TP17-76	3	2.5	SO	20/07/17	11:35	Discrete			5						272	
- 02	↓	4	3.2			11:45				5	X	X	X			275	
- 03	KIG-TP17-77	1	0.6			1230				5		X		X		288	
- 04		2	1.7			1240				3	X					289	
- 05		3	2.6			1250				5						290	
- 06	↓	4	3.3			1300				5	X	X	X			298	
- 07	KIG-TP17-78	1	0.7			1405				5	X	X		X		299	
- 08		2	1.7			1415				5						302	
- 09		3	2.5			1425				3						305	
- 10	↓	4	3.2			1435				5	X	X	X			309	
- 11	KIG-TP17-79	1	0.6			1540				6						319	
- 12	↓	2	1.5	↓	↓	1550	↓	FDA	038400	3						320	

Sampler's Signature	Relinquished by Signature	Company	Date	Time	Received by Signature	Company
		Golder	22-Jul-17	16 30		

Comments	Method of Shipment	Waybill No	Received for Lab by	Date	Time
Invoice Dave Oguntharpe				July 22-17	14:20

Shipped by	Shipment Condition / Seal Intact:	Temp (°C)	Cooler opened by	Date	Time
		3			

WHITE: Golder Copy YELLOW: Lab Copy

Fri 26, 2017 9:18 RSED

17N242036

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03833 page 5 of 11

Golder Associates

200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 165-7309/5000		Laboratory Name: ALS	
Short Title: Kitimat Field Investigation	Golder Contact: Erin O'Brien	Address:	
Golder E-mail Address 1: erin_o_b@golder.com	Golder E-mail Address 2: linda_kemp@golder.com	Telephone/Fax:	Contact: Wendy Chan

Office Name: Vancouver — EQuIS Facility Code: 25753359 — EQuIS upload: ☐

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☐ Regular (5 Days)
Criteria: ☐ CSR ☒ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail — Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Metals	LEPH/HEPH/PAH	BTEX/VPH	VOC	Nutrient Suite	RUSH (Select TAT above)	Remarks (over)
03833-01	KM-MW-21	1	0.3-3.5		20/07/17	09:50	Dup			5	X				X	3 5 9	
-02	KM-MW-21D	2	18-20			10:10				3						3 6 6	
-03		3	30-35			10:30				5		X	X			3 6 8	
-04		3	45-50			10:50				5						3 6 9	
-05		3	5.8-6.8			11:20		FDA	03833-04	5		X	X	X		3 7 0	
-06		5	5.8-6.8			11:20	↓	FD	03833-05	5						3 7 2	
-07	KM-MW-22I	1	0.3-3.5		21/07/17	08:50				5						3 7 5	
-08		2	16-20			09:00				3						3 7 8	
-09		3	30-35			09:10				3						3 8 0	
-10		4	45-50			09:20		FDA	03833-11	5		X	X	X		3 8 1	
-11		4	45-50			09:30	↓	FD	03833-12	3						3 8 2	
-12	↓	5	6.0-6.5	↓	↓	09:50				3						3 8 4	

Sampler's Signature:	Relinquished by: Signature	Company: Golder	Date: 22-JUL-17	Time: 16 30	Received by: Signature	Company: ALS	
Comments: Please Dilute Down to 5ml for the pce	Method of Shipment:	Waybill No.:	Received for Lab by:	Date: July 25/17	Time: 14:20		
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C):	Cooler opened by:	Date:	Time:	

WHITE: Golder Copy YELLOW: Lab Copy

Jul 26, 2017
9:18
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17N242036

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03834 page 6 of 11

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 16-557709/5000			Laboratory Name: AGAT
Short Title: KM Field Inv	Golder Contact: [illegible]		Address
Golder E-mail Address 1: [illegible] @golder.com	Golder E-mail Address 2: [illegible] @golder.com		Telephone/Fax: Contact: Faye [illegible]

Office Name: Vancouver

EQuIS Facility Code: 24533859
EQuIS upload: ☐

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Regular (5 Days)
Criteria: ☐ CSR ☒ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	metals	LEPH/HEPH/PAH	BTEX/VOH	VOC	Sat. Nat + Cl Resist.	RUSH (Select TAT above)	Remarks (over)
03834 - 01	KM-HA-17	6	7.5-8.5	S	21/07/17	10:00	Dup.			5						411	
- 02	↓	7	9.0-10.0			10:30				5		X	X			417	
- 03	KM-HA-17	1	0.3-0.5			11:30				6						418	
- 04		2	1.5-2.0			11:45				3						420	
- 05		3	3.0-3.5			12:00				3		X				421	
- 06		4	4.5-5.0			12:20		FD	03834-07	5		X	X	X		423	
- 07		4	4.5-5.0			12:20		FD	03834-06	5						427	
- 08		5	6.5-7.0			12:50				3						430	
- 09		6	8.0-8.5			13:10				3		X				432	
- 10	↓	7	9.5-10.0			13:40				5		X	X	X		434	
- 11	KM-HA-17A	1	0.3-0.5			14:50				6	X			X		436	
- 12	↓	2	1.5-2.0	↓	↓	15:00	↓			3						439	

Sampler's Signature:	Relinquished by: Signature	Company: Golder	Date: 22-Jul-17	Time: 16:30	Received by: Signature	Company: AGAT	
Comments: Invoice Direct to Supervisor	Method of Shipment:	Waybill No:	Received for Lab by:	Date: July 22-17	Time: 14:30		
	Shipped by:	Shipment Condition / Seal Intact:	Temp (°C):	Cooler opened by:	Date:	Time:	

WHITE: Golder Copy YELLOW: Lab Copy

Jul 26, 2017 ESED

17N242036

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03835 page 7 of 11

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 167709/5000
Laboratory Name: AGAT
Short Title: KM Field Trip
Golder Contact: Francois
Address:
Golder E-mail Address 1: @golder.com
Golder E-mail Address 2: linda_kemf @golder.com
Telephone/Fax:
Contact: Maggie Chan

Office Name: Vancouver
EQuIS Facility Code: 28433859
EQuIS upload: ☐

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Regular (5 Days)
Criteria: ☒ CSR ☐ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail
Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Metals	LEPH/HEPH/PAH	BTEX/VPH	VOC	Salt pack Na + Cl			RUSH (Select TAT above)	Remarks (over)
03835 - 01	KM-MW23	3	30-32.5		21/07/17	15:10	Grab			5		X	X	X				466	
- 02		4	45-50			15:20				3		X						469	
- 03		5	60-65			15:40				5								474	
- 04		6	80-85			16:00				5		X	X					477	
- 05		7	90-100			16:20				5								478	
- 06		8	115-120		22/07/17	07:00				5								479	
- 07	~~KM-MW24~~	~~4~~	~~2.5-5~~		22/07/17													~~480~~	H
- 08	KM-MW24	4	1-2.5			10:40				6	X				X		480	481	H
- 09		5	2-17-20			10:50				5							481	~~483~~	H
- 10		6	30-35			11:20		FD	03835-11	5		X					483	~~484~~	H
- 11		3	30-35			11:20		FD	03835-10	3							484	~~485~~	H
- 12		4	47-52			11:40				5		X	X	X				485	

3.05

Sampler's Signature	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
		Golder	22-JUL-17	16 30		AGAT

Comments	Method of Shipment	Waybill No	Received for Lab by	Date	Time
Drive Drive Drive Osgoode				July 22-17	19 20

Shipped by:	Shipment Condition / Seal Intact:	Temp (°C)	Cooler opened by	Date	Time
		5			

WHITE: Golder Copy YELLOW: Lab Copy

Jul 26 2017
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9:18

17M42036

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03840 page 8 of 11

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709 / 5000
Short Title: K19 Field Inv
Golder Contact: Erin O'Brien
Golder E-mail Address 1: erin_o'brien @golder.com
Golder E-mail Address 2: Linda_Kemp @golder.com
Laboratory Name: ACAT
Address: 120-8600 Glenlyon Pkwy Burnaby BC
Telephone/Fax: (778) 452-4000
Contact: Maggie Chan

Office Name: Vancouver - Virtual Way
EQuIS Facility Code: 28433859
EQuIS upload: ☑

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☑ Regular (5 Days)
Criteria: ☑ CSR ☑ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail
Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Metals IS	LEPH/HEPH/PAHs	BTEX/VPH	VOC	Salt + Dissolved Cl					RUSH (Select TAT above)	Remarks (over)
03840 - 01	K19-TP17-79	2	1.5	SO	20/07/17	1550	Discrete	FD	03829-12	3									498	498 4hr	
- 02		3	2.4			1600				5										499	
- 03		4	3.0			1610				5		X	X							500	
- 04	K19-TP17-80	1	0.5		21/07/17	0900				6	X				X					501	
- 05		2	1.4			0910				3		X								502	
- 06		3	2.6			0920				5		X	X	X						503	
- 07		4	3.7			0930				3		X	X							505	
- 08		5	4.3			0940				5										506	
- 09	K19-TP17-81	1	0.6			1040				6	X	X	X							507	
- 10		2	1.7			1050				3										508	
- 11		3	2.6			1100				5		X	X	X						509	
- 12		4	3.5			1110				5										510	

Sampler's Signature	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
		Golder	22-Jul-17	16:39		ACAT

Comments	Method of Shipment	Waybill No.	Received for Lab by:	Date	Time
Invoice Dave Osguthorpe				July 22-17	14:20

Shipped by	Shipment Condition Seal Intact:	Temp (°C)	Cooler opened by	Date	Time
		4			

WHITE: Golder Copy YELLOW: Lab Copy

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17N242036

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03841 page 9 of 4

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709 / 5000
Short Title: K19 Field Inv.
Golder Contact: Erin O'Brien
Golder E-mail Address 1: erin_o'brien @golder.com
Golder E-mail Address 2: linda_kemp @golder.com

Laboratory Name: AGAT
Address: 120-8600 Glenlyon Pkwy, Burnaby, BC
Telephone/Fax: (778) 452-4000
Contact: Maggie Chan

Office Name: Vancouver - Virtual Way
EQuIS Facility Code: 28433859
EQuIS upload: ☑

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☑ Regular (5 Days)
Criteria: ☑ CSR ☑ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail
Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Metals	LEPH/HEPH/PAHs	BTEX/VPH	VOC	Natural Soil Parameters	RUSH (Select TAT above)	Remarks (over)
03841 - 01	K19-TP17-82	1	0.7	SO	21/07/17	1200	Discrete			6	X					511	
- 02		2	1.4			1210		FDA 03841-03		5		X	X	X		523	
- 03		2	1.4			1210		FD 03841-02		5		X	X	X		524	
- 04		3	2.5			1220				3		X	X			527	
- 05		4	4.2			1230				5						528	
- 06	K19-TP17-83	1	0.6			1350				6						529	
- 07		2	1.5			1400				5		X	X			530	
- 08		3	2.6			1410				3						541	
- 09		4	3.9			1420				5		X	X			545	
- 10	K19-TP17-84	1	0.7			1520		FDA 03841-11		6						546	
- 11		1	0.7			1520		FD 03841-10		6						547	
- 12		2	1.6			1530				5		X	X			548	

Sampler's Signature	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
		Golder	22-Jul-17	1630		AGAT

Comments	Method of Shipment	Waybill No	Received for Lab by:	Date	Time
Invoice to Dave Osguthorpe				Jul 22-17	1420

Shipped by	Shipment Condition / Seal Intact	Temp (°C)	Cooler opened by	Date	Time
		12			

WHITE: Golder Copy YELLOW: Lab Copy

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CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

17M242036

No. 03842 page 1 of 11

Golder Associates

200 - 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709 / 5000			Laboratory Name: AGAT
Short Title: K19 Field Inv	Golder Contact: Erin O'Brien		Address: 120 - 8600 Glenlyon Pkwy Burnaby BC
Golder E-mail Address 1: erin_o'brien @golder.com	Golder E-mail Address 2: Linda_Kemp @golder.com		Telephone/Fax: (778) 452-4000 Contact: Maggie Chan

Office Name: Vancouver - Virtual Way

EQuIS Facility Code: 28433859

EQuIS upload: ☑

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☑ Regular (5 Days)

Criteria: ☑ CSR ☑ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Metals	LEPH/HEPH/PAH	BTEX/VOH	VOC	Salt Metals Pkg	RUSH (Select TAT above)	Remarks (over)
03842-01	K19-TP17-84	3	2.5	SO	21/07/17	1540	Discrete			3						552	
-02	↓	4	4.0		↓	1550				5						559	
-03	K19-TP17-85	1	0.7		22/07/17	0900				6	X				X	567	
-04		2	1.5			0910				5		X	X	X		569	
-05		3	2.5			0920		FDA	03842-06	3	X	X				572	
-06		3	2.5			0920		FD	03842-05	3	X					573	
-07		4	4.1			0930				3						574	
-08	K19-TP17-86	1	0.7			1015				6	X	X	X		X	576	
-09		2	1.5			1025				5						578	
-10		3	2.7			1035				3						580	
-11		4	4.0			1045				5		X				581	
-12	K19-TP17-87	1	0.7	↓	↓	1130	↓			5						582	

Sampler's Signature	Relinquished by: Signature	Company: Golder	Date: 22-Jul-17	Time: 16 30	Received by: Signature	Company: AGAT
Comments: Invoice Dave Osgathorpe	Method of Shipment:	Waybill No:	Received for Lab by: Xavier	Date: July 22-17	Time: 1740	
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C): 10	Cooler opened by:	Date:	Time:

WHITE: Golder Copy YELLOW: Lab Copy

Jul 26, 2017 9:18

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17N242036

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03843 page 11 of 11

Golder Associates
200 - 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709 / 5000
Short Title: Kig Field Inv
Golder Contact: Erin o'Brien
Golder E-mail Address 1: erin_o'brien @golder.com
Golder E-mail Address 2: linda_kemp @golder.com

Laboratory Name: AGAT
Address: 120 - 8100 Glenlyon Pkwy, Burnaby BC
Telephone/Fax: (778) 452-4000
Contact: Maggie Chan

Office Name: Vancouver - Virtual Way
EQuIS Facility Code: 23433859
EQuIS upload: ☑

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☑ Regular (5 Days)
Criteria: ☑ CSR ☑ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail
Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Metals / LEAH / HEAT / PAH	BTEX / VPH	VOC	Anions + Silt particle size	RUSH (Select TAT above)	Remarks (over)
03843-01	Kig-TP17-57	2	1.7	SO	22/07/17	1140	Discrete			3					587	
-02		3	2.8			1150				5	X	X			588	
-03		4	4.1			1200				3					590	
-04		5	4.8			1210				5	X	X	X		591	
03843-05	Kig-TP17-57	1	0.2	SO	22/07/17	1410	Grab			1				X	592	
-06																
-07																
-08																
-09																
-10																
-11																
-12																

Sampler's Signature	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
		Golder	22-JUL-17	16 30		AGAT

Comments	Method of Shipment	Waybill No	Received for Lab by	Date	Time
Invoice Dave Osguthorpe				Jul/26/17	14:2
	Shipped by	Shipment Condition Seal Intact	Temp (°C) 4	Cooler opened by:	Date / Time

WHITE: Golder Copy YELLOW: Lab Copy

Jul 26, 2017 9:18

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AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM

RECEIVING BASICS - Shipping

Company/Consultant: Golder

Courier: _____ Prepaid Collect

Waybill# _____

Branch: EDM GP (FN) FM RD VAN LYD FSJ EST Other: _____

Custody Seal Intact: Yes (No) NA

TAT: <24hr 24-48hr 48-72hr (Reg) Other _____

Cooler Quantity: 9

TIME SENSITIVE ISSUES - Shipping

ALREADY EXCEEDED HOLD TIME? Yes No

Inorganic Tests (Please Circle): Mibi , BOD , Nitrate/Nitrite , Turbidity , Microtox , Ortho PO4 , Tedlar Bag , Residual Chlorine , Chlorophyll* , Chloroamines*

Earliest Expiry: _____

Hydrocarbons: Earliest Expiry _____

SAMPLE INTEGRITY - Shipping

Hazardous Samples: YES (NO) Precaution Taken: _____

Legal Samples: Yes (No)

International Samples: Yes (No)

Tape Sealed: Yes (No)

Coolant Used: Icepack (Bagged Ice) Free Ice Free Water None

Temperature (Bottles/Jars only) N/A if only Soil Bags Received

FROZEN (Please Circle if samples received Frozen)

1 (Bottle/Jar) 7+8+10=9 °C	2 (Bottle/Jar) 1+10+5=5 °C
3 (Bottle/Jar) 5+6+6=5 °C	4 (Bottle/Jar) 9+8+7=8 °C
5 (Bottle/Jar) 8+9+5=7 °C	6 (Bottle/Jar) 9+9+8=8 °C
7 (Bottle/Jar) 9+9+9=9 °C	8 (Bottle/Jar) 7+8+4=6 °C
9 (Bottle/Jar) 9+7+9=8 °C	10 (Bottle/Jar) ___+___+___=___ °C

(If more than 10 coolers are received use another sheet of paper and attach)

LOGISTICS USE ONLY

Workorder No: _____

Samples Damaged: Yes (No) If YES why?

No Bubble Wrap Frozen Courier

Other: _____

Account Project Manager: _____ have they been notified of the above issues: Yes No

Whom spoken to: _____ Date/Time: _____

CPM Initial _____

General Comments: _____

* Subcontracted Analysis (See CPM)

Date issued: May 22, 2015

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM - BURNABY

Work Order # 17W2420 36

RECEIVING BASICS:

Received From: Rosenau Waybill #: _____

SAMPLE QUANTITIES:

Coolers: 19 Containers: 537

TIME SENSITIVE ISSUES:

Earliest Date Sampled: Jul 22, 2017 ALREADY EXCEEDED? Yes (No)

NON-CONFORMANCES:

3 temperatures of samples* and average of each cooler: (record differing temperatures on the CoC next to sample ID's) ***use jars when available**

(1) 12 + 13 + 13 = 13 °C (2) 11 + 10 + 11 = 11 °C (3) 0 + 0 + 0 = 0 °C (4) 8 + 8 + 8 = 8 °C

Was ice or ice pack present: (Yes) No 5) 9+7+11=9 6) 4+7+4=4 7) 6+4+5=4 8) 7+8+7=7

Integrity Issues: 9) 7+5+6=6 10) 4+4+5=4 11) 0+0+0=0 12) 4+4+5=4
13) 4+4+3=4 14) 1+0+0=0 15) 4+5+4=4 16) 6+6+5=6
17) 4+3+5=4 18) 5+5+6=5 19) 0+0+1=0

Account Project Manager: _____ have they been notified of the above issues: Yes No

Whom spoken to: _____ Date and Time: _____

ADDITIONAL NOTES:

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM

RECEIVING BASICS - Shipping

Company/Consultant: Public Works + Govt Services Canada

Courier: Purolator Prepaid Collect

Waybill# 331120302475

Branch: EDM GP FN FM RD VAN LYD FSJ EST Other:____

If multiple sites were submitted at once: Yes No

Custody Seal Intact: Yes No NA

TAT: <24hr 24-48hr 48-72hr Reg Other_____

Cooler Quantity: 1

TIME SENSITIVE ISSUES - Shipping

ALREADY EXCEEDED HOLD TIME? Yes No

Inorganic Tests (Please Circle): Mibi , BOD , Nitrate/Nitrite , Turbidity , Microtox , Ortho PO4 , Tedlar Bag , Residual Chlorine , Chlorophyll* , Chloroamines*

Earliest Expiry:_____

Hydrocarbons: Earliest Expiry _____

SAMPLE INTEGRITY - Shipping

Hazardous Samples: YES NO Precaution Taken:_____

Legal Samples: Yes No

International Samples: Yes No

Tape Sealed: Yes No

Coolant Used: Icepack Bagged Ice Free Ice Free Water None

Temperature (Bottles/Jars only) N/A if only Soil Bags Received

FROZEN (Please Circle if samples received Frozen)

1 (Bottle/Jar) 6 + 5 + 5 = 5 °C 2(Bottle/Jar)___+___+___=____°C

3 (Bottle/Jar)___+___+___=____°C 4 (Bottle/Jar)___+___+___=____°C

5 (Bottle/Jar)___+___+___=____°C 6 (Bottle/Jar)___+___+___=____°C

7 (Bottle/Jar)___+___+___=____°C 8 (Bottle/Jar)___+___+___=____°C

9 (Bottle/Jar)___+___+___=____°C 10 (Bottle/Jar)___+___+___=____°C

(If more than 10 coolers are received use another sheet of paper and attach)

LOGISTICS USE ONLY

Workorder No: 17N292036

Samples Damaged: Yes No If YES why?

No Bubble Wrap Frozen Courier

Other: _____

Account Project Manager: _____ have they been notified of the above issues: Yes No

Whom spoken to: _____ Date/Time: _____

CPM Initial_____

General Comments: _____

* Subcontracted Analysis (See CPM)

Date issued: October 05, 2015
Document ID: SR-9505.003

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
219-800 BURRARD ST
VANCOUVER, BC V6Z 0B9
604-671-1831

ATTENTION TO: Erin O'Brien

PROJECT: 1657709/5000

AGAT WORK ORDER: 17N243343

SOIL ANALYSIS REVIEWED BY: Andrew Garrard, B.Sc., General Manager

TRACE ORGANICS REVIEWED BY: Andrew Garrard, B.Sc., General Manager

WATER ANALYSIS REVIEWED BY: Andrew Garrard, B.Sc., General Manager

DATE REPORTED: Aug 04, 2017

PAGES (INCLUDING COVER): 64

VERSION*: 2

Should you require any information regarding this analysis please contact your client services representative at (778) 452-4000

*NOTES

VERSION 2: Sample receipt temperature 5°C.

Version 2 issued on August 10, 2017 to report update VOCs in water package. Version 2 is an amendment to version 1.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Metals in Soil

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

SAMPLE DESCRIPTION:				03836-01	03836-06	03837-02	03837-09	03837-10	03838-11	03845-01
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2017-07-22	2017-07-22	2017-07-23	2017-07-23	2017-07-23	2017-07-25	2017-07-23
Parameter	Unit	G / S	RDL	8598920	8598925	8598933	8598940	8598941	8598954	8598960
Aluminum	µg/g		10	8950	14000	14400	12500	12200	20500	16300
Antimony	µg/g		0.1	0.6	0.8	0.5	0.6	0.6	0.7	0.6
Arsenic	µg/g		0.1	9.0	13.2	9.5	11.3	11.2	11.7	9.2
Barium	µg/g		0.5	187	288	446	695	837	373	559
Beryllium	µg/g		0.1	0.5	0.8	0.9	0.9	0.8	1.0	0.9
Bismuth	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	µg/g		0.01	0.12	0.17	0.13	0.21	0.19	0.19	0.70
Calcium	µg/g		10	907	1730	1480	1720	1630	3950	6640
Chromium	µg/g		1	16	25	22	24	25	26	22
Cobalt	µg/g		0.1	8.0	12.4	11.3	12.7	13.0	8.6	10.2
Copper	µg/g		0.2	16.0	24.2	26.4	26.1	25.7	26.4	21.6
Iron	µg/g		10	18400	26100	26100	23400	23400	34100	30200
Lead	µg/g		0.1	11.1	14.3	13.1	13.9	13.6	12.0	11.7
Lithium	µg/g		0.5	11.0	16.3	14.5	16.3	16.1	14.0	31.4
Magnesium	µg/g		10	2100	3500	3120	2920	2870	4500	3700
Manganese	µg/g		1	249	309	274	372	305	199	296
Mercury	µg/g		0.01	0.04	0.04	0.03	0.04	0.04	0.06	0.07
Molybdenum	µg/g		0.2	1.3	2.2	1.1	1.6	1.6	1.9	1.3
Nickel	µg/g		0.5	15.0	22.5	21.3	30.3	28.6	25.8	27.9
Phosphorus	µg/g		5	476	560	415	486	497	1520	666
Potassium	µg/g		5	1230	2120	2180	1910	2000	2570	2230
Selenium	µg/g		0.1	0.8	0.7	0.9	0.9	0.7	0.8	1.2
Silver	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sodium	µg/g		5	61	99	111	188	190	119	113
Strontium	µg/g		1	16	27	22	35	36	33	45
Thallium	µg/g		0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
Tin	µg/g		0.2	0.5	0.7	0.7	0.8	1.1	0.7	0.6
Titanium	µg/g		1	126	150	160	105	109	132	97
Uranium	µg/g		0.2	1.1	1.3	1.4	1.4	1.5	2.0	1.0
Vanadium	µg/g		1	31	47	36	44	44	49	44

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Certificate of Analysis

AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Metals in Soil

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03836-01	03836-06	03837-02	03837-09	03837-10	03838-11	03845-01
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-22	2017-07-22	2017-07-23	2017-07-23	2017-07-23	2017-07-25	2017-07-23
Parameter	Unit	G / S	RDL	8598920	8598925	8598933	8598940	8598941	8598954	8598960
Zinc	µg/g		1	64	97	87	100	96	93	80
Zirconium	µg/g		0.1	1.3	1.6	1.7	1.7	1.6	2.8	1.9
pH 1:2	pH units		0.05	5.16	5.32	5.27	5.62	5.57	5.19	6.99

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8598920-8598960 Results are based on the dry weight of the sample

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AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Soil Salinity - Na & Cl

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03836-01	03836-06	03837-02	03837-09	03837-10	03838-11
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-22	2017-07-22	2017-07-23	2017-07-23	2017-07-23	2017-07-25
Parameter	Unit	G / S	RDL	8598920	8598925	8598933	8598940	8598941	8598954
Chloride, Soluble	mg/L		2	39	2	14	46	26	13
Sodium, Soluble	mg/L		2	16	3	12	36	22	7
Saturation Percentage	%		0.1	36.0	53.0	52.0	43.0	53.0	50.0
Chloride, Soluble (mg/kg)	mg/kg		2	14	<2	7	20	14	7
Sodium, Soluble (mg/kg)	mg/kg		2	6	<2	6	15	12	4

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03836-04	03836-08	03836-09	03836-10	03836-12	03837-01	03837-05	03837-08
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-22	2017-07-22	2017-07-22	2017-07-22	2017-07-22	2017-07-22	2017-07-23	2017-07-23
Parameter	Unit	G / S	RDL	8598923	8598927	8598928	8598929	8598931	8598932	8598936	8598939
Naphthalene	µg/g		0.05	0.19	0.59	0.52	0.71	1.00	1.39	0.98	1.32
2-Methylnaphthalene	µg/g		0.05	0.59	1.30	1.24	1.26	1.38	2.59	1.69	2.60
1-Methylnaphthalene	µg/g		0.05	0.40	0.934	0.87	0.90	0.98	1.77	1.18	1.78
Acenaphthylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	µg/g		0.02	0.07	0.16	0.18	0.16	0.14	0.27	0.22	0.30
Phenanthrene	µg/g		0.02	0.33	0.47	0.52	0.44	0.38	0.70	0.54	0.80
Anthracene	µg/g		0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Fluoranthene	µg/g		0.01	0.03	0.05	0.06	0.04	0.03	0.04	0.05	0.07
Pyrene	µg/g		0.01	0.06	0.09	0.10	0.07	0.05	0.09	0.08	0.13
Benzo(a)anthracene	µg/g		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Chrysene	µg/g		0.05	0.08	0.11	0.12	0.10	0.08	0.15	0.12	0.18
Benzo(b)fluoranthene	µg/g		0.05	<0.05	0.05	0.05	0.05	<0.05	0.06	0.05	0.07
Benzo(j)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	<0.03	0.03	0.04	0.03	<0.03	0.03	0.03	0.04
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	0.02
Dibenzo(a,h)anthracene	µg/g		0.005	0.006	0.009	0.010	0.009	0.006	<0.005	0.010	0.011
Benzo(g,h,i)perylene	µg/g		0.05	0.16	0.26	0.29	0.21	0.13	0.25	0.20	0.30
Quinoline	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
IACR CCME (Soil)	µg/g		0.6	0.6	0.8	0.9	0.8	0.6	0.9	0.8	1.0
B[a]P TPE (Soil)	µg/g		0.05	<0.05	0.05	0.06	0.05	<0.05	0.05	0.05	0.07
EPH C10-C19	µg/g		20	48	83	80	69	46	110	62	114
EPH C19-C32	µg/g		20	56	82	80	70	40	88	55	106
LEPH C10-C19	µg/g		20	47	82	79	68	44	108	60	112
HEPH C19-C32	µg/g		20	56	81	80	70	40	87	55	106
Benzo(b+j)fluoranthene	µg/g		0.05	<0.05	0.05	0.05	0.05	<0.05	0.06	0.05	0.07

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Certificate of Analysis

AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:	03836-04	03836-08	03836-09	03836-10	03836-12	03837-01	03837-05	03837-08
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	2017-07-22	2017-07-22	2017-07-22	2017-07-22	2017-07-22	2017-07-22	2017-07-23	2017-07-23
Surrogate	Unit	Acceptable Limits	8598923	8598927	8598928	8598929	8598931	8598932	8598936	8598939
Naphthalene - d8	%	50-130	91	71	81	77	91	98	113	105
2-Fluorobiphenyl	%	50-130	92	74	82	78	92	102	117	110
P-Terphenyl - d14	%	60-130	112	99	105	101	112	115	128	128

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SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

SAMPLE DESCRIPTION:				03838-01	03838-03	03838-06	03838-07		03838-08		03838-10
SAMPLE TYPE:				Soil	Soil	Soil	Soil		Soil		Soil
DATE SAMPLED:				2017-07-23	2017-07-23	2017-07-24	2017-07-24		2017-07-24		2017-07-24
Parameter	Unit	G / S	RDL	8598944	8598946	8598949	8598950	RDL	8598951	RDL	8598953
Naphthalene	µg/g		0.005	0.014	0.044	0.306	0.746	0.05	0.96	0.005	0.256
2-Methylnaphthalene	µg/g		0.005	<0.005	<0.005	<0.005	0.340	0.05	0.51	0.005	0.375
1-Methylnaphthalene	µg/g		0.005	0.052	0.088	0.593	0.935	0.05	1.18	0.005	0.555
Acenaphthylene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	0.05	<0.05	0.005	<0.005
Acenaphthene	µg/g		0.005	<0.005	<0.005	<0.005	<0.005	0.05	<0.05	0.005	<0.005
Fluorene	µg/g		0.02	<0.02	<0.02	0.13	0.08	0.02	0.12	0.02	0.04
Phenanthrene	µg/g		0.02	0.20	0.17	0.20	0.16	0.02	0.18	0.02	0.61
Anthracene	µg/g		0.004	<0.004	<0.004	<0.004	<0.004	0.004	<0.004	0.004	<0.004
Fluoranthene	µg/g		0.01	0.02	0.02	<0.01	<0.01	0.01	<0.01	0.01	0.10
Pyrene	µg/g		0.01	0.05	0.06	0.01	<0.01	0.01	<0.01	0.01	0.20
Benzo(a)anthracene	µg/g		0.03	<0.03	<0.03	<0.03	<0.03	0.03	<0.03	0.03	0.03
Chrysene	µg/g		0.05	0.08	0.13	<0.05	<0.05	0.05	<0.05	0.05	0.70
Benzo(b)fluoranthene	µg/g		0.05	<0.05	0.05	<0.05	<0.05	0.05	<0.05	0.05	0.36
Benzo(j)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	<0.03	<0.03	<0.03	<0.03	0.03	<0.03	0.03	0.05
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.02	0.07
Dibenzo(a,h)anthracene	µg/g		0.005	0.007	0.006	0.005	0.006	0.005	0.006	0.005	0.076
Benzo(g,h,i)perylene	µg/g		0.05	0.12	0.16	<0.05	<0.05	0.05	<0.05	0.05	0.53
Quinoline	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.05
IACR CCME (Soil)	µg/g		0.6	0.6	0.8	<0.6	0.6	0.6	0.6	0.6	3.5
B[a]P TPE (Soil)	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	0.05	0.18
EPH C10-C19	µg/g		20	216	245	857	484	20	573	20	57
EPH C19-C32	µg/g		20	353	427	119	85	20	89	20	54
LEPH C10-C19	µg/g		20	216	244	857	483	20	572	20	56
HEPH C19-C32	µg/g		20	353	427	118	84	20	89	20	53
Benzo(b+j)fluoranthene	µg/g		0.05	<0.05	0.05	<0.05	<0.05	0.05	<0.05	0.05	0.36

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AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:	03838-01	03838-03	03838-06	03838-07	03838-08	03838-10
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	2017-07-23	2017-07-23	2017-07-24	2017-07-24	2017-07-24	2017-07-24
Surrogate	Unit	Acceptable Limits	8598944	8598946	8598949	8598950	8598951	8598953
Naphthalene - d8	%	50-130	78	102	122	94	110	110
2-Fluorobiphenyl	%	50-130	73	98	117	94	110	110
P-Terphenyl - d14	%	60-130	103	109	127	126	118	118

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SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03845-01	03845-03
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2017-07-23	2017-07-23
Parameter	Unit	G / S	RDL	8598960	8598962
Naphthalene	µg/g		0.005	<0.005	<0.005
2-Methylnaphthalene	µg/g		0.005	<0.005	0.018
1-Methylnaphthalene	µg/g		0.005	0.006	0.027
Acenaphthylene	µg/g		0.005	<0.005	<0.005
Acenaphthene	µg/g		0.005	<0.005	<0.005
Fluorene	µg/g		0.02	<0.02	<0.02
Phenanthrene	µg/g		0.02	<0.02	0.06
Anthracene	µg/g		0.004	<0.004	<0.004
Fluoranthene	µg/g		0.01	<0.01	0.03
Pyrene	µg/g		0.01	<0.01	0.02
Benzo(a)anthracene	µg/g		0.03	<0.03	<0.03
Chrysene	µg/g		0.05	<0.05	0.11
Benzo(b)fluoranthene	µg/g		0.05	<0.05	0.07
Benzo(j)fluoranthene	µg/g		0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	<0.03	<0.03
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.005	0.005	0.018
Benzo(g,h,i)perylene	µg/g		0.05	<0.05	0.13
Quinoline	µg/g		0.05	<0.05	<0.05
IACR CCME (Soil)	µg/g		0.6	<0.6	0.9
B[a]P TPE (Soil)	µg/g		0.05	<0.05	<0.05
EPH C10-C19	µg/g		20	<20	24
EPH C19-C32	µg/g		20	30	64
LEPH C10-C19	µg/g		20	<20	24
HEPH C19-C32	µg/g		20	30	63
Benzo(b+j)fluoranthene	µg/g		0.05	<0.05	0.07

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AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:	03845-01	03845-03
		SAMPLE TYPE:	Soil	Soil
		DATE SAMPLED:	2017-07-23	2017-07-23
Surrogate	Unit	Acceptable Limits	8598960	8598962
Naphthalene - d8	%	50-130	97	83
2-Fluorobiphenyl	%	50-130	99	83
P-Terphenyl - d14	%	60-130	123	116

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8598923-8598939 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
Soil sample is visibly heterogeneous.
PAH detection limits increased due to sample dilution.

8598944-8598950 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
Soil sample is visibly heterogeneous.

8598951 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
Soil sample is visibly heterogeneous.
PAH detection limits increased due to sample dilution.

8598953-8598962 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
Soil sample is visibly heterogeneous.

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CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

BTEX / VPH (C6-C10) Soil

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03836-03	03836-09	03836-12	03837-01	03838-01	03838-06	03838-10
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-22	2017-07-22	2017-07-22	2017-07-22	2017-07-23	2017-07-24	2017-07-24
Parameter	Unit	G / S	RDL	8598922	8598928	8598931	8598932	8598944	8598949	8598953
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02
Toluene	µg/g		0.05	<0.05	<0.05	1.35	0.74	<0.05	<0.05	<0.05
Ethylbenzene	µg/g		0.05	<0.05	<0.05	0.81	0.87	<0.05	<0.05	<0.05
m&p-Xylene	µg/g		0.05	<0.05	0.10	2.09	2.43	<0.05	<0.05	<0.05
o-Xylene	µg/g		0.05	<0.05	0.05	1.09	1.27	<0.05	<0.05	<0.05
Styrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
VPH	µg/g		10	<10	19	45	64	<10	<10	<10
VH	µg/g		10	<10	19	50	69	<10	<10	<10
Total Xylenes	ug/g		0.1	<0.1	0.2	3.2	3.7	<0.1	<0.1	<0.1
Surrogate	Unit	Acceptable Limits								
Bromofluorobenzene	%	60-140		101	96	94	112	113	93	93
Dibromofluoromethane	%	60-140		118	114	108	111	122	120	117
Toluene - d8	%	60-140		106	105	103	110	122	115	107

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8598922-8598953 Results are based on dry weight of sample.
VPH results have been corrected for BTEX contributions.

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Certificate of Analysis

AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

BTEX Analysis - Leachate

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03838-06	03838-07	03838-08
		SAMPLE TYPE:		Soil	Soil	Soil
		DATE SAMPLED:		2017-07-24	2017-07-24	2017-07-24
Parameter	Unit	G / S	RDL	8598949	8598950	8598951
Benzene - Leachable	mg/L		0.005	<0.005	<0.005	<0.005
Toluene - Leachable	mg/L		0.005	<0.005	0.005	<0.005
Ethylbenzene - Leachable	mg/L		0.005	<0.005	<0.005	<0.005
Xylenes - Leachable	mg/L		0.005	<0.005	0.008	<0.005
Surrogate	Unit	Acceptable Limits				
Bromofluorobenzene	%	70-130		93	91	105
Dibromofluoromethane	%	70-130		120	109	110
Toluene - d8	%	70-130		98	108	108

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8598949-8598951 Analysis based on "as received"

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PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

CCME F2-F4 (Water)

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

SAMPLE DESCRIPTION:				03844-01	03844-02	03844-03	03844-04	03765-06
SAMPLE TYPE:				Water	Water	Water	Water	Water
DATE SAMPLED:				2017-07-23	2017-07-23	2017-07-23	2017-07-23	2017-07-25
Parameter	Unit	G / S	RDL	8598956	8598957	8598958	8598959	8599005
F2 (C10-C16)	µg/L		100	<100	<100	<100	1510	<100
F3 (C16-C34)	µg/L		100	100	170	150	190	<100
F4 (C34-C50)	µg/L		100	<100	100	110	<100	<100

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8598956-8598959 The C10 - C16 (F2), C16 - C34 (F3), and C34 - C50 (F4) fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Quality control data is available upon request.
Assistance in the interpretation of data is available upon request.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
The chromatogram has returned to baseline by the retention time of nC50.
Extraction and holding times were met for this sample.

8599005 The C10 - C16 (F2), C16 - C34 (F3), and C34 - C50 (F4) fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Quality control data is available upon request.
Assistance in the interpretation of data is available upon request.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
The chromatogram has not returned to baseline by the retention time of nC50.
Extraction and holding times were met for this sample.

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AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Glycols Analysis in Soil

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03838-11
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2017-07-25
Parameter	Unit	G / S	RDL	8598954
Propylene Glycol	mg/kg		10	<10
Monoethylene Glycol	mg/kg		10	<10
Diethylene Glycol	mg/kg		10	<10
Triethylene Glycol	mg/kg		10	<10
Tetraethylene Glycol	mg/kg		10	<10
Surrogate	Unit	Acceptable Limits		
Heptanol	%	50-150		100

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8598954 Analysis by GC/FID.
Results are based on the dry weight of the sample.
Analysis performed at AGAT Calgary.

Certified By:

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AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Glycols Analysis in Water

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03844-01	03844-02	03844-04
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2017-07-23	2017-07-23	2017-07-23
Parameter	Unit	G / S	RDL	8598956	8598957	8598959
Propylene Glycol	mg/L		10	<10	<10	<10
Monoethylene Glycol	mg/L		10	<10	<10	<10
Diethylene Glycol	mg/L		5	<5	<5	<5
Triethylene Glycol	mg/L		10	<10	<10	<10
Tetraethylene Glycol	mg/L		10	<10	<10	<10
Surrogate	Unit	Acceptable Limits				
Heptanol	%	50-150		112	111	122

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8598956-8598959 Identification based on retention time relative to standards.
Analysis performed at AGAT Calgary.

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PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Water Low Level

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03765-01	03765-02	03765-03	03765-04	03765-05	03844-01	03844-02	03844-03
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-25	2017-07-25	2017-07-25	2017-07-25	2017-07-25	2017-07-23	2017-07-23	2017-07-23
Parameter	Unit	G / S	RDL	8598915	8598916	8598917	8598918	8598919	8598956	8598957	8598958
Naphthalene	µg/L		0.05	<0.05	<0.05	<0.05	0.06	0.06	<0.05	<0.05	<0.05
Quinoline	µg/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Acenaphthene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Fluorene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Phenanthrene	µg/L		0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.05	0.07	0.04
Anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acridine	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02
Pyrene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02
Benzo(a)anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(j)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenzo(a,h)anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1-Methylnaphthalene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EPH C10-C19	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
EPH C19-C32	µg/L		100	<100	<100	<100	<100	<100	<100	120	110
LEPH C10-C19	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
HEPH C19-C32	µg/L		100	<100	<100	<100	<100	<100	<100	120	110
Benzo(b+j)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Surrogate	Unit	Acceptable Limits									
Naphthalene - d8	%	50-130		80	80	79	81	82	78	59	119
2-Fluorobiphenyl	%	50-130		81	82	82	83	84	81	53	114
P-Terphenyl - d14	%	60-130		67	82	80	83	79	88	71	115

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Certificate of Analysis

AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Water Low Level

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

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SAMPLED BY:

Public Works LEPH/HEPH in Water Low Level

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03844-04	03765-06
		SAMPLE TYPE:		Water	Water
		DATE SAMPLED:		2017-07-23	2017-07-25
Parameter	Unit	G / S	RDL	8598959	8599005
Naphthalene	µg/L		0.05	15.5	<0.05
Quinoline	µg/L		0.1	<0.1	<0.1
Acenaphthylene	µg/L		0.02	<0.02	<0.02
Acenaphthene	µg/L		0.02	<0.02	<0.02
Fluorene	µg/L		0.02	0.23	<0.02
Phenanthrene	µg/L		0.04	0.11	<0.04
Anthracene	µg/L		0.01	<0.01	<0.01
Acridine	µg/L		0.05	<0.05	<0.05
Fluoranthene	µg/L		0.02	<0.02	<0.02
Pyrene	µg/L		0.02	<0.02	<0.02
Benzo(a)anthracene	µg/L		0.01	<0.01	<0.01
Chrysene	µg/L		0.01	<0.01	<0.01
Benzo(b)fluoranthene	µg/L		0.01	<0.01	<0.01
Benzo(j)fluoranthene	µg/L		0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L		0.01	<0.01	<0.01
Benzo(a)pyrene	µg/L		0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/L		0.01	<0.01	<0.01
Dibenzo(a,h)anthracene	µg/L		0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L		0.01	<0.01	<0.01
1-Methylnaphthalene	µg/L		0.05	7.32	<0.05
2-Methylnaphthalene	µg/L		0.05	2.15	<0.05
EPH C10-C19	µg/L		100	1520	<100
EPH C19-C32	µg/L		100	110	<100
LEPH C10-C19	µg/L		100	1510	<100
HEPH C19-C32	µg/L		100	110	<100
Benzo(b+j)fluoranthene	µg/L		0.01	<0.01	<0.01
Surrogate	Unit	Acceptable Limits		8598959	8599005
Naphthalene - d8	%	50-130		96	77
2-Fluorobiphenyl	%	50-130		66	79
P-Terphenyl - d14	%	60-130		76	83

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SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Water Low Level

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8598915-8599005 LEPH & HEPH results have been corrected for PAH contributions.

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PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03836-05	03836-08	03837-06	03837-08	03838-03	03838-07	03838-08	03845-03
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-22	2017-07-22	2017-07-23	2017-07-23	2017-07-23	2017-07-24	2017-07-24	2017-07-23
Parameter	Unit	G / S	RDL	8598924	8598927	8598937	8598939	8598946	8598950	8598951	8598962
Chloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vinyl Chloride	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromomethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acetone	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Butanone (MEK)	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroform	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	0.08	<0.02
1,2-Dichloropropane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethene	µg/g		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromodichloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4-Methyl-2-pentanone (MIBK)	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Toluene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylene Dibromide	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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Certificate of Analysis

AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03836-05	03836-08	03837-06	03837-08	03838-03	03838-07	03838-08	03845-03
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-22	2017-07-22	2017-07-23	2017-07-23	2017-07-23	2017-07-24	2017-07-24	2017-07-23
Parameter	Unit	G / S	RDL	8598924	8598927	8598937	8598939	8598946	8598950	8598951	8598962
Chlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	µg/g		0.05	<0.05	<0.05	0.13	0.25	<0.05	0.08	0.14	<0.05
m&p-Xylene	µg/g		0.05	<0.05	<0.05	0.36	0.79	<0.05	0.15	0.26	<0.05
Bromoform	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
o-Xylene	µg/g		0.05	<0.05	<0.05	0.17	0.35	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
VH	µg/g		10	26	20	15	53	<10	31	47	<10
VPH	µg/g		10	26	20	15	52	<10	30	46	<10
Total Xylenes	µg/g		0.2	<0.2	<0.2	0.5	1.1	<0.2	<0.2	0.3	<0.2
Surrogate	Unit	Acceptable Limits									
Bromofluorobenzene	%	60-140		117	103	93	117	88	120	114	112
Dibromofluoromethane	%	60-140		122	110	97	121	89	119	114	115
Toluene - d8	%	60-140		133	121	107	133	99	132	120	127

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8598924-8598962 Results are based on dry weight of sample.

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AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Water

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

SAMPLE DESCRIPTION:				03765-01	03765-02	03765-03	03765-04	03765-05	03844-01	03844-02	03844-03
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2017-07-25	2017-07-25	2017-07-25	2017-07-25	2017-07-25	2017-07-23	2017-07-23	2017-07-23
Parameter	Unit	G / S	RDL	8598915	8598916	8598917	8598918	8598919	8598956	8598957	8598958
Chloromethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl Chloride	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Bromomethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Acetone	µg/L		10	<10	<10	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Dichloromethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Methyl tert-butyl ether (MTBE)	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
2-Butanone (MEK)	µg/L		10	<10	<10	<10	<10	<10	<10	<10	<10
trans-1,2-Dichloroethylene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethylene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Tetrachloride	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
4-Methyl-2-pentanone (MIBK)	µg/L		10	<10	<10	<10	<10	<10	<10	<10	<10
cis-1,3-Dichloropropene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Ethylene Dibromide	µg/L		0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Tetrachloroethene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1

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Certificate of Analysis

AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Water

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03765-01	03765-02	03765-03	03765-04	03765-05	03844-01	03844-02	03844-03
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-25	2017-07-25	2017-07-25	2017-07-25	2017-07-25	2017-07-23	2017-07-23	2017-07-23
Parameter	Unit	G / S	RDL	8598915	8598916	8598917	8598918	8598919	8598956	8598957	8598958
Chlorobenzene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
m&p-Xylene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
o-Xylene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
VH	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
VPH	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
Total Trihalomethanes	µg/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Total Xylenes	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Surrogate	Unit	Acceptable Limits									
Bromofluorobenzene	%	70-130		94	105	93	92	98	100	97	99
Dibromofluoromethane	%	70-130		86	92	82	85	89	94	92	90
Toluene - d8	%	70-130		99	107	93	95	104	108	106	104

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CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Water

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03844-04	03765-06
		SAMPLE TYPE:		Water	Water
		DATE SAMPLED:		2017-07-23	2017-07-25
Parameter	Unit	G / S	RDL	8598959	8599005
Chloromethane	µg/L		1	<1	<1
Vinyl Chloride	µg/L		1	<1	<1
Bromomethane	µg/L		1	<1	<1
Chloroethane	µg/L		1	<1	<1
Trichlorofluoromethane	µg/L		1	<1	<1
Acetone	µg/L		10	328	<10
1,1-Dichloroethene	µg/L		1	<1	<1
Dichloromethane	µg/L		1	<1	<1
Methyl tert-butyl ether (MTBE)	µg/L		1	<1	<1
2-Butanone (MEK)	µg/L		10	<10	<10
trans-1,2-Dichloroethylene	µg/L		1	<1	<1
1,1-Dichloroethane	µg/L		1	<1	<1
cis-1,2-Dichloroethylene	µg/L		1	<1	<1
Chloroform	µg/L		1	<1	<1
1,2-Dichloroethane	µg/L		1	274	<1
1,1,1-Trichloroethane	µg/L		1	<1	<1
Carbon Tetrachloride	µg/L		0.5	<0.5	<0.5
Benzene	µg/L		0.5	1900	<0.5
1,2-Dichloropropane	µg/L		1	45	<1
Trichloroethene	µg/L		1	<1	<1
Bromodichloromethane	µg/L		1	<1	<1
trans-1,3-Dichloropropene	µg/L		1	<1	<1
4-Methyl-2-pentanone (MIBK)	µg/L		10	18	<10
cis-1,3-Dichloropropene	µg/L		1	<1	<1
1,1,2-Trichloroethane	µg/L		1	<1	<1
Toluene	µg/L		0.5	138	<0.5
Dibromochloromethane	µg/L		1	<1	<1
Ethylene Dibromide	µg/L		0.3	<0.3	<0.3
Tetrachloroethene	µg/L		1	<1	<1
1,1,1,2-Tetrachloroethane	µg/L		1	<1	<1

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AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Water

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03844-04	03765-06
		SAMPLE TYPE:		Water	Water
		DATE SAMPLED:		2017-07-23	2017-07-25
Parameter	Unit	G / S	RDL	8598959	8599005
Chlorobenzene	µg/L		1	<1	<1
Ethylbenzene	µg/L		0.5	134	<0.5
m&p-Xylene	µg/L		0.5	130	<0.5
Bromoform	µg/L		1	<1	<1
Styrene	µg/L		0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	µg/L		1	<1	<1
o-Xylene	µg/L		0.5	16.0	<0.5
1,3-Dichlorobenzene	µg/L		0.5	<0.5	<0.5
1,4-Dichlorobenzene	µg/L		0.5	<0.5	<0.5
1,2-Dichlorobenzene	µg/L		0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	µg/L		1	<1	<1
VH	µg/L		100	5040	<100
VPH	µg/L		100	2720	<100
Total Trihalomethanes	µg/L		2	<2	<2
Total Xylenes	µg/L		1	146	<1
Surrogate	Unit	Acceptable Limits			
Bromofluorobenzene	%	70-130		106	93
Dibromofluoromethane	%	70-130		98	85
Toluene - d8	%	70-130		115	96

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

British Columbia CSR - Schedule 6 Total Metals

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03844-01		03844-02	03844-03
		SAMPLE TYPE:		Water		Water	Water
		DATE SAMPLED:		2017-07-23		2017-07-23	2017-07-23
Parameter	Unit	G / S	RDL	8598956	RDL	8598957	8598958
Aluminum Total	µg/L		5	829	50	4020	4290
Antimony Total	µg/L		0.5	<0.5	0.5	<0.5	<0.5
Arsenic Total	µg/L		0.1	0.4	0.1	1.9	2.2
Barium Total	µg/L		0.5	88.1	0.5	228	663
Beryllium Total	µg/L		0.05	0.07	0.05	0.27	0.30
Boron Total	µg/L		5	9	5	17	23
Cadmium Total	µg/L		0.01	0.06	0.01	0.14	0.14
Calcium Total	µg/L		50	6490	50	13700	16600
Chromium Total	µg/L		0.5	0.9	0.5	6.1	6.9
Cobalt Total	µg/L		0.05	0.45	0.05	2.31	2.69
Copper Total	µg/L		0.5	2.4	0.5	8.3	9.0
Iron Total	µg/L		10	670	10	5800	6960
Lead Total	µg/L		0.05	0.15	0.05	5.14	5.20
Lithium Total	µg/L		0.5	5.0	0.5	7.4	11.6
Magnesium Total	µg/L		50	1610	50	2910	4500
Manganese Total	µg/L		1	22	1	68	92
Mercury Total	µg/L		0.01	0.04	0.01	0.05	0.05
Molybdenum Total	µg/L		0.1	0.1	0.1	0.5	0.6
Nickel Total	µg/L		0.5	4.5	0.5	10.1	10.5
Potassium Total	µg/L		100	411	100	1690	1920
Selenium Total	µg/L		0.5	<0.5	0.5	<0.5	<0.5
Silver Total	µg/L		0.02	<0.02	0.02	0.03	0.04
Sodium Total	µg/L		100	875	100	1630	4650
Thallium Total	µg/L		0.02	<0.02	0.02	0.08	0.09
Titanium Total	µg/L		1	8	1	31	31
Uranium Total	µg/L		0.01	0.09	0.01	0.30	0.33
Vanadium Total	µg/L		1	1	1	14	16
Zinc Total	µg/L		5	10	5	36	40
Total Hardness (calc)	ug CaCO3/L		100	22800	100	46200	60000

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AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

British Columbia CSR - Schedule 6 Total Metals

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8598956 Some total metal results are less than the dissolved metal results; results are within the precision of the method.

8598958 Some total metal results are less than the dissolved metal results; results are within the precision of the method.

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AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Chloride in Water

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

SAMPLE DESCRIPTION:				03765-01		03765-03	03765-04	03765-05	03844-01	03844-02	03844-03
SAMPLE TYPE:				Water		Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2017-07-25		2017-07-25	2017-07-25	2017-07-25	2017-07-23	2017-07-23	2017-07-23
Parameter	Unit	G / S	RDL	8598915	RDL	8598917	8598918	8598919	8598956	8598957	8598958
Chloride	mg/L		5	1050	0.05	46.7	1.98	1.95	0.05	1.24	6.27

SAMPLE DESCRIPTION:			03765-06	
SAMPLE TYPE:			Water	
DATE SAMPLED:			2017-07-25	
Parameter	Unit	G / S	RDL	8599005
Chloride	mg/L		5	<5

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:

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AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03765-01		03765-02		03765-03		03765-04	03765-05
		SAMPLE TYPE:		Water		Water		Water		Water	Water
		DATE SAMPLED:		2017-07-25		2017-07-25		2017-07-25		2017-07-25	2017-07-25
Parameter	Unit	G / S	RDL	8598915	RDL	8598916	RDL	8598917	RDL	8598918	8598919
Aluminum Dissolved	µg/L		2	35	2	11	2	<2	2	<2	<2
Antimony Dissolved	µg/L		0.2	<0.2	0.2	0.5	0.2	0.3	0.2	<0.2	<0.2
Arsenic Dissolved	µg/L		0.1	0.4	0.1	0.5	0.1	0.2	0.1	0.2	0.2
Barium Dissolved	µg/L		2	3630	0.2	51.8	0.2	129	0.2	141	135
Beryllium Dissolved	µg/L		0.01	0.13	0.01	0.06	0.01	<0.01	0.01	<0.01	<0.01
Bismuth Dissolved	µg/L		0.05	<0.05	0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05
Boron Dissolved	µg/L		2	133	2	253	2	95	2	273	243
Cadmium Dissolved	µg/L		0.01	0.19	0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01
Calcium Dissolved	µg/L		100	366000	50	65500	50	76400	50	38600	38600
Chromium Dissolved	µg/L		0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5	<0.5
Cobalt Dissolved	µg/L		0.05	10.2	0.05	3.18	0.05	0.79	0.05	0.24	0.24
Copper Dissolved	µg/L		0.2	0.7	0.2	1.0	0.2	0.2	0.2	<0.2	<0.2
Iron Dissolved	µg/L		10	16400	10	24	10	735	10	707	709
Lead Dissolved	µg/L		0.05	0.07	0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05
Lithium Dissolved	µg/L		2.5	216	2.5	173	0.5	58.1	2.5	112	117
Magnesium Dissolved	µg/L		50	102000	50	28200	50	22600	50	19300	19100
Manganese Dissolved	µg/L		1	14700	1	576	1	157	1	606	606
Mercury Dissolved	µg/L		0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01
Molybdenum Dissolved	µg/L		0.05	1.16	0.05	3.17	0.05	0.68	0.05	0.23	0.19
Nickel Dissolved	µg/L		0.2	18.5	0.2	10.3	0.2	3.0	0.2	0.4	0.4
Potassium Dissolved	µg/L		50	6760	50	4980	50	2590	50	2350	2320
Selenium Dissolved	µg/L		0.5	<0.5	0.5	11.6	0.5	<0.5	0.5	<0.5	<0.5
Silicon Dissolved	µg/L		50	8100	50	5080	50	5000	50	5630	5610
Silver Dissolved	µg/L		0.02	<0.02	0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.02
Sodium Dissolved	µg/L		50	41000	50	17900	50	17300	50	10600	10400
Strontium Dissolved	µg/L		1	2000	0.1	686	0.1	370	0.1	756	748
Sulphur Dissolved	µg/L		500	5100	500	33900	500	10100	500	3920	3920
Thallium Dissolved	µg/L		0.01	0.01	0.01	0.02	0.01	<0.01	0.01	<0.01	<0.01
Tin Dissolved	µg/L		0.05	0.12	0.05	0.45	0.05	0.11	0.05	0.15	0.14
Titanium Dissolved	µg/L		0.5	1.9	0.5	1.2	0.5	1.1	0.5	1.1	1.2

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Certificate of Analysis

AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03765-01		03765-02		03765-03		03765-04	03765-05
		SAMPLE TYPE:		Water		Water		Water		Water	Water
		DATE SAMPLED:		2017-07-25		2017-07-25		2017-07-25		2017-07-25	2017-07-25
Parameter	Unit	G / S	RDL	8598915	RDL	8598916	RDL	8598917	RDL	8598918	8598919
Uranium Dissolved	µg/L		0.01	0.67	0.01	4.29	0.01	1.17	0.01	0.43	0.39
Vanadium Dissolved	µg/L		0.5	<0.5	0.5	0.9	0.5	<0.5	0.5	<0.5	<0.5
Zinc Dissolved	µg/L		2	24	2	3	2	<2	2	<2	<2
Zirconium Dissolved	µg/L		0.1	<0.1	0.1	0.1	0.1	<0.1	0.1	<0.1	<0.1
Hardness (calc)	ug CaCO3/L		100	1330000	100	280000	100	284000	100	176000	175000

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Certificate of Analysis

AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03844-01	03844-02		03844-03		03844-04		03765-06
		SAMPLE TYPE:		Water	Water		Water		Water		Water
		DATE SAMPLED:		2017-07-23	2017-07-23		2017-07-23		2017-07-23		2017-07-25
Parameter	Unit	G / S	RDL	8598956	8598957	RDL	8598958	RDL	8598959	RDL	8599005
Aluminum Dissolved	µg/L		2	676	551	20	1170	2	13	2	4
Antimony Dissolved	µg/L		0.2	<0.2	<0.2	0.2	<0.2	0.2	0.4	0.2	<0.2
Arsenic Dissolved	µg/L		0.1	0.3	0.4	0.1	0.7	0.1	12.0	0.1	0.1
Barium Dissolved	µg/L		0.2	72.8	87.6	2	467	2	960	0.2	92.5
Beryllium Dissolved	µg/L		0.01	0.05	0.04	0.01	0.09	0.01	0.01	0.01	0.02
Bismuth Dissolved	µg/L		0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.05	0.05	<0.05
Boron Dissolved	µg/L		2	8	10	2	15	2	27	2	95
Cadmium Dissolved	µg/L		0.01	0.07	0.04	0.01	0.10	0.01	<0.01	0.01	0.06
Calcium Dissolved	µg/L		50	6230	11500	50	15900	50	120000	50	69400
Chromium Dissolved	µg/L		0.5	0.6	0.6	0.5	1.1	0.5	0.7	0.5	<0.5
Cobalt Dissolved	µg/L		0.05	0.33	0.29	0.05	0.77	0.05	1.14	0.05	0.31
Copper Dissolved	µg/L		0.2	1.7	1.8	0.2	3.8	0.2	0.4	0.2	0.4
Iron Dissolved	µg/L		10	568	484	10	1660	10	146000	10	<10
Lead Dissolved	µg/L		0.05	0.09	0.15	0.05	2.09	0.05	0.05	0.05	<0.05
Lithium Dissolved	µg/L		0.5	4.3	4.0	0.5	7.1	0.5	12.5	0.5	64.1
Magnesium Dissolved	µg/L		50	1550	2040	50	3870	50	49600	50	21900
Manganese Dissolved	µg/L		1	19	16	1	47	1	1930	1	42
Mercury Dissolved	µg/L		0.01	0.05	0.03	0.01	0.03	0.01	0.04	0.01	<0.01
Molybdenum Dissolved	µg/L		0.05	0.07	0.21	0.05	0.19	0.05	1.35	0.05	0.07
Nickel Dissolved	µg/L		0.2	4.2	3.8	0.2	4.5	0.2	2.2	0.2	3.3
Potassium Dissolved	µg/L		50	390	677	50	1030	50	1590	50	1610
Selenium Dissolved	µg/L		0.5	<0.5	<0.5	0.5	<0.5	0.5	2.3	0.5	<0.5
Silicon Dissolved	µg/L		50	2250	2220	50	3360	50	4440	50	5630
Silver Dissolved	µg/L		0.02	<0.02	<0.02	0.02	<0.02	0.02	<0.02	0.02	<0.02
Sodium Dissolved	µg/L		50	875	1570	50	4670	50	23400	50	9390
Strontium Dissolved	µg/L		0.1	22.8	28.7	0.1	66.5	0.1	838	0.1	288
Sulphur Dissolved	µg/L		500	<500	633	500	853	500	10900	500	8110
Thallium Dissolved	µg/L		0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	0.01
Tin Dissolved	µg/L		0.05	<0.05	<0.05	0.05	<0.05	0.05	0.09	0.05	<0.05
Titanium Dissolved	µg/L		0.5	3.0	2.6	0.5	7.0	0.5	2.8	0.5	1.8

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Certificate of Analysis

AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-07-28

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03844-01	03844-02		03844-03		03844-04		03765-06
		SAMPLE TYPE:		Water	Water		Water		Water		Water
		DATE SAMPLED:		2017-07-23	2017-07-23		2017-07-23		2017-07-23		2017-07-25
Parameter	Unit	G / S	RDL	8598956	8598957	RDL	8598958	RDL	8598959	RDL	8599005
Uranium Dissolved	µg/L		0.01	0.08	0.13	0.01	0.20	0.01	1.55	0.01	0.49
Vanadium Dissolved	µg/L		0.5	0.7	0.7	0.5	1.9	0.5	2.8	0.5	<0.5
Zinc Dissolved	µg/L		2	8	6	2	12	2	2	2	<2
Zirconium Dissolved	µg/L		0.1	1.1	0.9	0.1	1.3	0.1	2.5	0.1	<0.1
Hardness (calc)	ug CaCO3/L		100	21900	37100	100	55600	100	504000	100	263000

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Soil Analysis

RPT Date: Aug 04, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Public Works Metals in Soil															
Aluminum	8602904		16900	14600	14.4%	< 10	106%	70%	130%	101%	90%	110%			
Antimony	8602904		0.4	<0.1	NA	< 0.1	110%	70%	130%	106%	90%	110%			
Arsenic	8602904		1.4	1.6	12.5%	< 0.1	116%	70%	130%	103%	90%	110%			
Barium	8602904		254	191	28.2%	< 0.5	114%	70%	130%	102%	90%	110%			
Beryllium	8602904		0.4	0.3	NA	< 0.1	110%	70%	130%	99%	90%	110%			
Bismuth	8602904		<0.5	<0.5	NA	< 0.5				97%	85%	115%			
Cadmium	8602904		0.31	0.29	6.5%	< 0.01	94%	70%	130%	97%	90%	110%			
Calcium	8602904		6880	6130	11.6%	< 10	114%	70%	130%	103%	90%	110%			
Chromium	8602904		16	14	12.4%	< 1	102%	70%	130%	100%	90%	110%			
Cobalt	8602904		4.8	3.9	19.5%	< 0.1	104%	70%	130%	102%	90%	110%			
Copper	8602904		8.6	7.7	11.1%	< 0.2	99%	70%	130%	107%	90%	110%			
Iron	8602904		19000	15700	19.0%	< 10	113%	70%	130%	106%	90%	110%			
Lead	8602904		1.9	1.8	6.3%	< 0.1	81%	70%	130%	90%	90%	110%			
Lithium	8602904		13.3	10.3	25.6%	< 0.5				96%	85%	115%			
Magnesium	8602904		7320	5830	22.6%	< 10	116%	70%	130%	107%	90%	110%			
Manganese	8602904		164	151	8.5%	< 1	117%	70%	130%	99%	90%	110%			
Mercury	8602904		<0.01	<0.01	NA	< 0.01	87%	70%	130%	95%	90%	110%			
Molybdenum	8602904		0.9	0.5	NA	< 0.2	106%	70%	130%	96%	90%	110%			
Nickel	8602904		14.2	11.0	24.9%	< 0.5	104%	70%	130%	104%	90%	110%			
Phosphorus	8602904		973	887	9.3%	< 5	110%	70%	130%	96%	90%	110%			
Potassium	8602904		4320	3490	21.2%	< 5	122%	70%	130%	101%	90%	110%			
Selenium	8602904		0.7	0.9	28.8%	< 0.1				97%	90%	110%			
Silver	8602904		<0.5	<0.5	NA	< 0.5	99%	70%	130%	106%	90%	110%			
Sodium	8602904		640	567	12.1%	< 5	108%	70%	130%	104%	90%	110%			
Strontium	8602904		35	30	15.8%	< 1	95%	70%	130%	91%	90%	110%			
Thallium	8602904		0.2	0.1	NA	< 0.1	105%	70%	130%	91%	90%	110%			
Tin	8602904		0.3	<0.2	NA	< 0.2	99%	70%	130%	107%	90%	110%			
Titanium	8602904		881	750	16.0%	< 1				104%	90%	110%			
Uranium	8602904		1.0	0.9	NA	< 0.2	102%	70%	130%	96%	90%	110%			
Vanadium	8602904		59	50	16.8%	< 1	103%	70%	130%	106%	90%	110%			
Zinc	8602904		70	54	25.8%	< 1	102%	70%	130%	99%	90%	110%			
Zirconium	8602904		0.3	0.2	NA	< 0.1				102%	90%	110%			
pH 1:2	8602904		7.51	7.42	1.2%		96%	90%	110%	100%	95%	105%			

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Soil Salinity - Na & Cl															
Chloride, Soluble	8519746	IH20171	293	291	0.7%	< 2	106%	80%	120%	109%	85%	115%			
Sodium, Soluble	8519746	IH20171	273	274	0.4%	< 2	116%	80%	120%	103%	85%	115%			
Saturation Percentage	8519746	IH20171	38.0	37.0	2.7%		103%	80%	120%						

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Soil Analysis (Continued)

RPT Date: Aug 04, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

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Quality Assurance

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AGAT WORK ORDER: 17N243343
PROJECT: 1657709/5000
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SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis

RPT Date: Aug 04, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Public Works LEPH/HEPH in Water Low Level															
EPH C10-C19	67611	W-MS	8910	9430	5.7%	< 100	103%	70%	130%				85%	70%	130%
EPH C19-C32	67611	W-MS	15500	16000	3.2%	< 100	98%	70%	130%				92%	70%	130%
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
BTEX / VPH (C6-C10) Soil															
Methyl tert-butyl ether (MTBE)	67609	8598922	<0.1	<0.1	NA	< 0.1	100%	80%	120%				98%	70%	130%
Benzene	67609	8598922	<0.02	<0.02	NA	< 0.02	98%	80%	120%				98%	70%	130%
Toluene	67609	8598922	<0.05	<0.05	NA	< 0.05	99%	80%	120%				96%	70%	130%
Ethylbenzene	67609	8598922	<0.05	<0.05	NA	< 0.05	99%	80%	120%				95%	70%	130%
m&p-Xylene	67609	8598922	<0.05	<0.05	NA	< 0.05	99%	80%	120%				95%	70%	130%
o-Xylene	67609	8598922	<0.05	<0.05	NA	< 0.05	99%	80%	120%				96%	70%	130%
Styrene	67609	8598922	<0.05	<0.05	NA	< 0.05	99%	80%	120%				96%	70%	130%
VPH	67609	8598922	<10	<10	NA	< 10									
VH	67609	8598922	<10	<10	NA	< 10									
Bromofluorobenzene	67609	8598922	101	100	1.0%		100%	60%	140%				94%	60%	140%
Dibromofluoromethane	67609	8598922	118	116	1.7%		100%	60%	140%				103%	60%	140%
Toluene - d8	67609	8598922	106	106	0.0%		100%	60%	140%				95%	60%	140%
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
Public Works LEPH/HEPH in Soil Low Level															
Naphthalene	67602	8598929	0.71	0.66	7.3%	< 0.005	102%	80%	120%				99%	50%	130%
2-Methylnaphthalene	67602	8598929	1.26	1.13	10.9%	< 0.005	102%	80%	120%				91%	50%	130%
1-Methylnaphthalene	67602	8598929	0.90	0.80	11.8%	< 0.005	102%	80%	120%				98%	50%	130%
Acenaphthylene	67602	8598929	<0.05	<0.05	NA	< 0.005	102%	80%	120%				91%	50%	130%
Acenaphthene	67602	8598929	<0.05	<0.05	NA	< 0.005	102%	80%	120%				102%	50%	130%
Fluorene	67602	8598929	0.16	0.15	6.5%	< 0.02	102%	80%	120%				84%	50%	130%
Phenanthrene	67602	8598929	0.44	0.42	4.7%	< 0.02	100%	80%	120%				79%	60%	130%
Anthracene	67602	8598929	<0.004	<0.004	NA	< 0.004	103%	80%	120%				107%	60%	130%
Fluoranthene	67602	8598929	0.04	0.04	NA	< 0.01	102%	80%	120%				97%	60%	130%
Pyrene	67602	8598929	0.07	0.07	0.0%	< 0.01	103%	80%	120%				107%	60%	130%
Benzo(a)anthracene	67602	8598929	<0.03	<0.03	NA	< 0.03	102%	80%	120%				89%	60%	130%
Chrysene	67602	8598929	0.10	0.10	NA	< 0.05	101%	80%	120%				104%	60%	130%
Benzo(b)fluoranthene	67602	8598929	0.05	0.05	NA	< 0.05	96%	80%	120%				84%	60%	130%
Benzo(j)fluoranthene	67602	8598929	<0.05	<0.05	NA	< 0.05	104%	80%	120%				126%	60%	130%
Benzo(k)fluoranthene	67602	8598929	<0.05	<0.05	NA	< 0.05	105%	80%	120%				79%	60%	130%
Benzo(a)pyrene	67602	8598929	0.03	0.03	NA	< 0.03	104%	80%	120%				84%	60%	130%
Indeno(1,2,3-c,d)pyrene	67602	8598929	<0.02	<0.02	NA	< 0.02	101%	80%	120%				84%	60%	130%
Dibenzo(a,h)anthracene	67602	8598929	0.009	0.009	NA	< 0.005	101%	80%	120%				74%	60%	130%
Benzo(g,h,i)perylene	67602	8598929	0.21	0.21	NA	< 0.05	101%	80%	120%				101%	60%	130%

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
AGAT WORK ORDER: 17N243343
PROJECT: 1657709/5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Aug 04, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Quinoline	67602	8598929	<0.05	<0.05	NA	< 0.05	102%	80%	120%				114%	50%	130%
IACR CCME (Soil)	67602	8598929	0.8	0.8	NA	< 0.6									
B[a]P TPE (Soil)	67602	8598929	0.05	0.05	NA	< 0.05									
EPH C10-C19	67602	8598929	69	68	NA	< 20	102%	70%	130%				90%	65%	120%
EPH C19-C32	67602	8598929	70	68	NA	< 20	102%	70%	130%				86%	80%	120%
Naphthalene - d8	67602	8598929	77	76	1.3%		100%	80%	120%				93%	50%	130%
2-Fluorobiphenyl	67602	8598929	78	78	0.0%		100%	80%	120%				96%	50%	130%
P-Terphenyl - d14	67602	8598929	101	102	1.0%		100%	80%	120%				94%	60%	130%
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
Volatile Organic Compounds in Soil															
Chloromethane	67609	8598924	<0.05	<0.05	NA	< 0.05	99%	80%	120%				122%	60%	140%
Vinyl Chloride	67609	8598924	<0.05	<0.05	NA	< 0.05	100%	80%	120%				108%	60%	140%
Bromomethane	67609	8598924	<0.05	<0.05	NA	< 0.05	106%	80%	120%				124%	60%	140%
Chloroethane	67609	8598924	<0.05	<0.05	NA	< 0.05	101%	80%	120%				103%	60%	140%
Trichlorofluoromethane	67609	8598924	<0.05	<0.05	NA	< 0.05	101%	80%	120%				101%	70%	130%
Acetone	67609	8598924	<0.5	<0.5	NA	< 0.5	101%	80%	120%				93%	70%	130%
1,1-Dichloroethene	67609	8598924	<0.05	<0.05	NA	< 0.05	101%	80%	120%				97%	70%	130%
Dichloromethane	67609	8598924	<0.05	<0.05	NA	< 0.05	101%	80%	120%				94%	70%	130%
Methyl tert-butyl ether (MTBE)	67609	8598924	<0.1	<0.1	NA	< 0.1	101%	80%	120%				89%	70%	130%
2-Butanone (MEK)	67609	8598924	<0.5	<0.5	NA	< 0.5	101%	80%	120%				91%	70%	130%
trans-1,2-Dichloroethene	67609	8598924	<0.05	<0.05	NA	< 0.05	101%	80%	120%				94%	70%	130%
1,1-Dichloroethane	67609	8598924	<0.05	<0.05	NA	< 0.05	105%	80%	120%				98%	70%	130%
cis-1,2-Dichloroethene	67609	8598924	<0.05	<0.05	NA	< 0.05	101%	80%	120%				89%	70%	130%
Chloroform	67609	8598924	<0.05	<0.05	NA	< 0.05	101%	80%	120%				89%	70%	130%
1,2-Dichloroethane	67609	8598924	<0.05	<0.05	NA	< 0.05	101%	80%	120%				87%	70%	130%
1,1,1-Trichloroethane	67609	8598924	<0.05	<0.05	NA	< 0.05	101%	80%	120%				88%	70%	130%
Carbon Tetrachloride	67609	8598924	<0.02	<0.02	NA	< 0.02	102%	80%	120%				87%	70%	130%
Benzene	67609	8598924	<0.02	<0.02	NA	< 0.02	101%	80%	120%				90%	70%	130%
1,2-Dichloropropane	67609	8598924	<0.05	<0.05	NA	< 0.05	101%	80%	120%				89%	70%	130%
Trichloroethene	67609	8598924	<0.01	<0.01	NA	< 0.01	101%	80%	120%				89%	70%	130%
Bromodichloromethane	67609	8598924	<0.05	<0.05	NA	< 0.05	102%	80%	120%				86%	70%	130%
trans-1,3-Dichloropropene	67609	8598924	<0.05	<0.05	NA	< 0.05	102%	80%	120%				84%	60%	140%
4-Methyl-2-pentanone (MIBK)	67609	8598924	<0.5	<0.5	NA	< 0.5	103%	80%	120%				80%	70%	130%
cis-1,3-Dichloropropene	67609	8598924	<0.05	<0.05	NA	< 0.05	102%	80%	120%				86%	60%	140%
1,1,2-Trichloroethane	67609	8598924	<0.05	<0.05	NA	< 0.05	102%	80%	120%				84%	70%	130%
Toluene	67609	8598924	<0.05	<0.05	NA	< 0.05	102%	80%	120%				89%	70%	130%
Dibromochloromethane	67609	8598924	<0.05	<0.05	NA	< 0.05	103%	80%	120%				80%	70%	130%
Ethylene Dibromide	67609	8598924	<0.05	<0.05	NA	< 0.05	102%	80%	120%				83%	70%	130%
Tetrachloroethene	67609	8598924	<0.05	<0.05	NA	< 0.05	101%	80%	120%				72%	70%	130%

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Trace Organics Analysis (Continued)

RPT Date: Aug 04, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
1,1,1,2-Tetrachloroethane	67609	8598924	<0.05	<0.05	NA	< 0.05	103%	80%	120%				84%	70%	130%
Chlorobenzene	67609	8598924	<0.05	<0.05	NA	< 0.05	101%	80%	120%				89%	70%	130%
Ethylbenzene	67609	8598924	<0.05	<0.05	NA	< 0.05	101%	80%	120%				89%	70%	130%
m&p-Xylene	67609	8598924	<0.05	<0.05	NA	< 0.05	102%	80%	120%				87%	70%	130%
Bromoform	67609	8598924	<0.05	<0.05	NA	< 0.05	103%	80%	120%				77%	70%	130%
Styrene	67609	8598924	<0.05	<0.05	NA	< 0.05	102%	80%	120%				85%	70%	130%
1,1,2,2-Tetrachloroethane	67609	8598924	<0.05	<0.05	NA	< 0.05	102%	80%	120%				86%	70%	130%
o-Xylene	67609	8598924	<0.05	<0.05	NA	< 0.05	102%	80%	120%				87%	70%	130%
1,3-Dichlorobenzene	67609	8598924	<0.05	<0.05	NA	< 0.05	101%	80%	120%				89%	70%	130%
1,4-Dichlorobenzene	67609	8598924	<0.05	<0.05	NA	< 0.05	101%	80%	120%				92%	70%	130%
1,2-Dichlorobenzene	67609	8598924	<0.05	<0.05	NA	< 0.05	101%	80%	120%				89%	70%	130%
1,2,4-Trichlorobenzene	67609	8598924	<0.05	<0.05	NA	< 0.05	101%	80%	120%				87%	70%	130%
Bromofluorobenzene	67609	8598924	117	120	2.5%		107%	60%	140%				105%	60%	140%
Dibromofluoromethane	67609	8598924	122	129	5.6%		109%	60%	140%				104%	60%	140%
Toluene - d8	67609	8598924	133	132	0.8%		104%	60%	140%				110%	60%	140%
VH	67609	8598924	26	27	NA	< 10									
VPH	67609	8598924	26	27	NA	< 10									

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

BTEX Analysis - Leachate

Benzene - Leachable	67617	8598949	<0.005	<0.005	NA	< 0.005	98%	80%	120%				89%	70%	130%
Toluene - Leachable	67617	8598949	<0.005	<0.005	NA	< 0.005	99%	80%	120%				91%	70%	130%
Ethylbenzene - Leachable	67617	8598949	<0.005	<0.005	NA	< 0.005	99%	80%	120%				91%	70%	130%
Bromofluorobenzene	67617	8598949	93	96	3.2%		100%	60%	140%				101%	60%	140%
Dibromofluoromethane	67617	8598949	120	123	2.5%		100%	60%	140%				101%	60%	140%
Toluene - d8	67617	8598949	98	102	4.0%		100%	60%	140%				101%	60%	140%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Public Works LEPH/HEPH in Water Low Level

Naphthalene	67611	W-MS1	0.44	0.50	12.8%	< 0.05	102%	80%	120%				89%	50%	130%
Quinoline	67611	W-MS1	0.5	0.5	0.0%	< 0.1	102%	80%	120%				108%	50%	130%
Acenaphthylene	67611	W-MS1	0.44	0.49	10.8%	< 0.02	102%	80%	120%				89%	50%	130%
Acenaphthene	67611	W-MS1	0.45	0.49	8.5%	< 0.02	103%	80%	120%				92%	50%	130%
Fluorene	67611	W-MS1	0.46	0.51	10.3%	< 0.02	102%	80%	120%				94%	50%	130%
Phenanthrene	67611	W-MS1	0.41	0.46	11.5%	< 0.04	99%	80%	120%				84%	60%	130%
Anthracene	67611	W-MS1	0.50	0.54	7.7%	< 0.01	103%	80%	120%				100%	60%	130%
Acridine	67611	W-MS1	0.57	0.58	1.7%	< 0.05	102%	80%	120%				114%	50%	130%
Fluoranthene	67611	W-MS1	0.47	0.51	8.2%	< 0.02	101%	80%	120%				95%	60%	130%
Pyrene	67611	W-MS1	0.49	0.53	7.8%	< 0.02	102%	80%	120%				100%	60%	130%

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Trace Organics Analysis (Continued)

RPT Date: Aug 04, 2017

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Benzo(a)anthracene	67611	W-MS1	0.46	0.50	8.3%	< 0.01	102%	80%	120%				94%	60%	130%
Chrysene	67611	W-MS1	0.51	0.55	7.5%	< 0.01	104%	80%	120%				103%	60%	130%
Benzo(b)fluoranthene	67611	W-MS1	0.46	0.49	6.3%	< 0.01	101%	80%	120%				92%	60%	130%
Benzo(j)fluoranthene	67611	W-MS1	0.48	0.53	9.9%	< 0.01	103%	80%	120%				96%	60%	130%
Benzo(k)fluoranthene	67611	W-MS1	0.44	0.42	4.7%	< 0.01	102%	80%	120%				89%	60%	130%
Benzo(a)pyrene	67611	W-MS1	0.45	0.49	8.5%	< 0.01	103%	80%	120%				90%	60%	130%
Indeno(1,2,3-c,d)pyrene	67611	W-MS1	0.47	0.50	6.2%	< 0.01	102%	80%	120%				94%	60%	130%
Dibenzo(a,h)anthracene	67611	W-MS1	0.44	0.47	6.6%	< 0.01	102%	80%	120%				89%	60%	130%
Benzo(g,h,i)perylene	67611	W-MS1	0.47	0.49	4.2%	< 0.01	102%	80%	120%				95%	60%	130%
1-Methylnaphthalene	67611	W-MS1	0.41	0.47	13.6%	< 0.05	102%	80%	120%				83%	50%	130%
2-Methylnaphthalene	67611	W-MS1	0.40	0.46	14.0%	< 0.05	101%	80%	120%				80%	50%	130%
EPH C10-C19	67611	W-MS1	8910	9430	5.7%	< 100	103%	70%	130%				85%	70%	130%
EPH C19-C32	67611	W-MS1	15500	16000	3.2%	< 100	98%	70%	130%				92%	70%	130%
LEPH C10-C19	67611	W-MS1	8910	9430	5.7%	< 100									
HEPH C19-C32	67611	W-MS1	15500	16000	3.2%	< 100									
Naphthalene - d8	67611	W-MS1	79	85	7.3%		100%	80%	120%				80%	50%	130%
2-Fluorobiphenyl	67611	W-MS1	82	88	7.1%		101%	80%	120%				82%	50%	130%
P-Terphenyl - d14	67611	W-MS1	81	87	7.1%		101%	80%	120%				81%	60%	130%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

CCME F2-F4 (Water)

F2 (C10-C16)	67611	W-MS1	6090	6470	6.1%	< 100	99%	80%	120%				84%	70%	130%
F3 (C16-C34)	67611	W-MS1	21200	21900	3.2%	< 100	107%	80%	120%				93%	70%	130%
F4 (C34-C50)	67611	W-MS1	4720	4960	5.0%	< 100	98%	80%	120%				89%	70%	130%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Glycols Analysis in Water

Propylene Glycol	111	8598959	<10	<10	NA	< 10	105%	70%	130%	112%	70%	130%	122%	60%	140%
Monoethylene Glycol	111	8598959	<10	<10	NA	< 10	101%	70%	130%	107%	70%	130%	116%	60%	140%
Diethylene Glycol	111	8598959	<5	<5	NA	< 5	103%	70%	130%	110%	70%	130%	120%	60%	140%
Triethylene Glycol	111	8598959	<10	<10	NA	< 10	100%	70%	130%	108%	70%	130%	118%	60%	140%
Tetraethylene Glycol	111	8598959	<10	<10	NA	< 10	96%	70%	130%	102%	70%	130%	111%	60%	140%

Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

Glycols Analysis in Soil

Propylene Glycol	112	8607030	<10	<10	NA	< 10	112%	70%	130%	86%	70%	130%	115%	60%	140%
Monoethylene Glycol	112	8607030	22	31	NA	< 10	110%	70%	130%	86%	70%	130%	112%	60%	140%
Diethylene Glycol	112	8607030	<10	<10	NA	< 10	110%	70%	130%	86%	70%	130%	112%	60%	140%
Triethylene Glycol	112	8607030	<10	<10	NA	< 10	107%	70%	130%	84%	70%	130%	108%	60%	140%
Tetraethylene Glycol	112	8607030	<10	<10	NA	< 10	104%	70%	130%	76%	70%	130%	91%	60%	140%

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Trace Organics Analysis (Continued)

RPT Date: Aug 04, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.															
Volatile Organic Compounds in Water															
Chloromethane	67619	8598915	<1	<1	NA	< 1	99%	80%	120%				99%	70%	130%
Vinyl Chloride	67619	8598915	<1	<1	NA	< 1	99%	80%	120%				102%	70%	130%
Bromomethane	67619	8598915	<1	<1	NA	< 1	95%	80%	120%				93%	70%	130%
Chloroethane	67619	8598915	<1	<1	NA	< 1	100%	80%	120%				104%	70%	130%
Trichlorofluoromethane	67619	8598915	<1	<1	NA	< 1	100%	80%	120%				101%	70%	130%
Acetone	67619	8598915	<10	<10	NA	< 10	100%	80%	120%						
1,1-Dichloroethene	67619	8598915	<1	<1	NA	< 1	100%	80%	120%				107%	70%	130%
Dichloromethane	67619	8598915	<1	<1	NA	< 1	100%	80%	120%				92%	70%	130%
Methyl tert-butyl ether (MTBE)	67619	8598915	<1	<1	NA	< 1	101%	80%	120%				93%	70%	130%
2-Butanone (MEK)	67619	8598915	<10	<10	NA	< 10	100%	80%	120%						
trans-1,2-Dichloroethylene	67619	8598915	<1	<1	NA	< 1	101%	80%	120%				103%	70%	130%
1,1-Dichloroethane	67619	8598915	<1	<1	NA	< 1	102%	80%	120%				103%	70%	130%
cis-1,2-Dichloroethylene	67619	8598915	<1	<1	NA	< 1	101%	80%	120%				99%	70%	130%
Chloroform	67619	8598915	<1	<1	NA	< 1	100%	80%	120%				101%	70%	130%
1,2-Dichloroethane	67619	8598915	<1	<1	NA	< 1	101%	80%	120%				97%	70%	130%
1,1,1-Trichloroethane	67619	8598915	<1	<1	NA	< 1	101%	80%	120%				100%	70%	130%
Carbon Tetrachloride	67619	8598915	<0.5	<0.5	NA	< 0.5	101%	80%	120%				100%	70%	130%
Benzene	67619	8598915	<0.5	<0.5	NA	< 0.5	100%	80%	120%				101%	70%	130%
1,2-Dichloropropane	67619	8598915	<1	<1	NA	< 1	101%	80%	120%				97%	70%	130%
Trichloroethene	67619	8598915	<1	<1	NA	< 1	101%	80%	120%				99%	70%	130%
Bromodichloromethane	67619	8598915	<1	<1	NA	< 1	101%	80%	120%				100%	70%	130%
trans-1,3-Dichloropropene	67619	8598915	<1	<1	NA	< 1	101%	80%	120%				97%	70%	130%
4-Methyl-2-pentanone (MIBK)	67619	8598915	<10	<10	NA	< 10	101%	80%	120%						
cis-1,3-Dichloropropene	67619	8598915	<1	<1	NA	< 1	101%	80%	120%				96%	70%	130%
1,1,2-Trichloroethane	67619	8598915	<1	<1	NA	< 1	101%	80%	120%				97%	70%	130%
Toluene	67619	8598915	<0.5	<0.5	NA	< 0.5	100%	80%	120%				103%	70%	130%
Dibromochloromethane	67619	8598915	<1	<1	NA	< 1	101%	80%	120%				96%	70%	130%
Ethylene Dibromide	67619	8598915	<0.3	<0.3	NA	< 0.3	101%	80%	120%				97%	70%	130%
Tetrachloroethene	67619	8598915	<1	<1	NA	< 1	100%	80%	120%				81%	70%	130%
1,1,1,2-Tetrachloroethane	67619	8598915	<1	<1	NA	< 1	100%	80%	120%				102%	70%	130%
Chlorobenzene	67619	8598915	<1	<1	NA	< 1	100%	80%	120%				95%	70%	130%
Ethylbenzene	67619	8598915	<0.5	<0.5	NA	< 0.5	100%	80%	120%				96%	70%	130%
m&p-Xylene	67619	8598915	<0.5	<0.5	NA	< 0.5	100%	80%	120%				97%	70%	130%
Bromoform	67619	8598915	<1	<1	NA	< 1	101%	80%	120%				89%	70%	130%
Styrene	67619	8598915	<0.5	<0.5	NA	< 0.5	101%	80%	120%				96%	70%	130%
1,1,2,2-Tetrachloroethane	67619	8598915	<1	<1	NA	< 1	101%	80%	120%				94%	70%	130%
o-Xylene	67619	8598915	<0.5	<0.5	NA	< 0.5	100%	80%	120%				98%	70%	130%

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Trace Organics Analysis (Continued)

RPT Date: Aug 04, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
1,3-Dichlorobenzene	67619	8598915	<0.5	<0.5	NA	< 0.5	100%	80%	120%				96%	70%	130%
1,4-Dichlorobenzene	67619	8598915	<0.5	<0.5	NA	< 0.5	100%	80%	120%				95%	70%	130%
1,2-Dichlorobenzene	67619	8598915	<0.5	<0.5	NA	< 0.5	100%	80%	120%				96%	70%	130%
1,2,4-Trichlorobenzene	67619	8598915	<1	<1	NA	< 1	101%	80%	120%				98%	70%	130%
Bromofluorobenzene	67619	8598915	94	108	13.9%		102%	70%	130%				97%	70%	130%
Dibromofluoromethane	67619	8598915	86	94	8.9%		105%	70%	130%				94%	70%	130%
Toluene - d8	67619	8598915	99	110	10.5%		103%	70%	130%				102%	70%	130%
VH	67619	8598915	<100	<100	NA	< 100									
VPH	67619	8598915	<100	<100	NA	< 100									

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Volatile Organic Compounds in Water

Chloromethane	67620	8599005	<1	<1	NA	< 1	99%	80%	120%				100%	70%	130%
Vinyl Chloride	67620	8599005	<1	<1	NA	< 1	100%	80%	120%				106%	70%	130%
Bromomethane	67620	8599005	<1	<1	NA	< 1	106%	80%	120%				100%	70%	130%
Chloroethane	67620	8599005	<1	<1	NA	< 1	101%	80%	120%				109%	70%	130%
Trichlorofluoromethane	67620	8599005	<1	<1	NA	< 1	101%	80%	120%				110%	70%	130%
Acetone	67620	8599005	<10	<10	NA	< 10	101%	80%	120%						
1,1-Dichloroethene	67620	8599005	<1	<1	NA	< 1	101%	80%	120%				118%	70%	130%
Dichloromethane	67620	8599005	<1	<1	NA	< 1	101%	80%	120%				101%	70%	130%
Methyl tert-butyl ether (MTBE)	67620	8599005	<1	<1	NA	< 1	101%	80%	120%				109%	70%	130%
2-Butanone (MEK)	67620	8599005	<10	<10	NA	< 10	101%	80%	120%						
trans-1,2-Dichloroethylene	67620	8599005	<1	<1	NA	< 1	101%	80%	120%				112%	70%	130%
1,1-Dichloroethane	67620	8599005	<1	<1	NA	< 1	105%	80%	120%				115%	70%	130%
cis-1,2-Dichloroethylene	67620	8599005	<1	<1	NA	< 1	101%	80%	120%				103%	70%	130%
Chloroform	67620	8599005	<1	<1	NA	< 1	101%	80%	120%				104%	70%	130%
1,2-Dichloroethane	67620	8599005	<1	<1	NA	< 1	101%	80%	120%				105%	70%	130%
1,1,1-Trichloroethane	67620	8599005	<1	<1	NA	< 1	101%	80%	120%				103%	70%	130%
Carbon Tetrachloride	67620	8599005	<0.5	<0.5	NA	< 0.5	102%	80%	120%				104%	70%	130%
Benzene	67620	8599005	<0.5	<0.5	NA	< 0.5	101%	80%	120%				104%	70%	130%
1,2-Dichloropropane	67620	8599005	<1	<1	NA	< 1	101%	80%	120%				103%	70%	130%
Trichloroethene	67620	8599005	<1	<1	NA	< 1	101%	80%	120%				103%	70%	130%
Bromodichloromethane	67620	8599005	<1	<1	NA	< 1	102%	80%	120%				103%	70%	130%
trans-1,3-Dichloropropene	67620	8599005	<1	<1	NA	< 1	102%	80%	120%				104%	70%	130%
4-Methyl-2-pentanone (MIBK)	67620	8599005	<10	<10	NA	< 10	103%	80%	120%						
cis-1,3-Dichloropropene	67620	8599005	<1	<1	NA	< 1	102%	80%	120%				102%	70%	130%
1,1,2-Trichloroethane	67620	8599005	<1	<1	NA	< 1	102%	80%	120%				105%	70%	130%
Toluene	67620	8599005	<0.5	<0.5	NA	< 0.5	102%	80%	120%				106%	70%	130%
Dibromochloromethane	67620	8599005	<1	<1	NA	< 1	103%	80%	120%				100%	70%	130%
Ethylene Dibromide	67620	8599005	<0.3	<0.3	NA	< 0.3	102%	80%	120%				106%	70%	130%

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
AGAT WORK ORDER: 17N243343
PROJECT: 1657709/5000
ATTENTION TO: Erin O'Brien
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Trace Organics Analysis (Continued)

RPT Date: Aug 04, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Tetrachloroethene	67620	8599005	<1	<1	NA	< 1	101%	80%	120%				81%	70%	130%
1,1,1,2-Tetrachloroethane	67620	8599005	<1	<1	NA	< 1	103%	80%	120%				104%	70%	130%
Chlorobenzene	67620	8599005	<1	<1	NA	< 1	101%	80%	120%				90%	70%	130%
Ethylbenzene	67620	8599005	<0.5	<0.5	NA	< 0.5	101%	80%	120%				92%	70%	130%
m&p-Xylene	67620	8599005	<0.5	<0.5	NA	< 0.5	102%	80%	120%				93%	70%	130%
Bromoform	67620	8599005	<1	<1	NA	< 1	103%	80%	120%				90%	70%	130%
Styrene	67620	8599005	<0.5	<0.5	NA	< 0.5	102%	80%	120%				92%	70%	130%
1,1,2,2-Tetrachloroethane	67620	8599005	<1	<1	NA	< 1	102%	80%	120%				95%	70%	130%
o-Xylene	67620	8599005	<0.5	<0.5	NA	< 0.5	102%	80%	120%				95%	70%	130%
1,3-Dichlorobenzene	67620	8599005	<0.5	<0.5	NA	< 0.5	101%	80%	120%				91%	70%	130%
1,4-Dichlorobenzene	67620	8599005	<0.5	<0.5	NA	< 0.5	101%	80%	120%				93%	70%	130%
1,2-Dichlorobenzene	67620	8599005	<0.5	<0.5	NA	< 0.5	101%	80%	120%				92%	70%	130%
1,2,4-Trichlorobenzene	67620	8599005	<1	<1	NA	< 1	101%	80%	120%				92%	70%	130%
Bromofluorobenzene	67620	8599005	93	98	5.2%		107%	70%	130%				106%	70%	130%
Dibromofluoromethane	67620	8599005	85	90	5.7%		109%	70%	130%				107%	70%	130%
Toluene - d8	67620	8599005	96	105	9.0%		104%	70%	130%				121%	70%	130%
VH	67620	8599005	<100	<100	NA	< 100									
VPH	67620	8599005	<100	<100	NA	< 100									

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

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Water Analysis

RPT Date: Aug 04, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Public Works Dissolved Metals															
Aluminum Dissolved	8600572		<2	<2	NA	< 2	107%	90%	110%	104%	90%	110%			
Antimony Dissolved	8596507		<0.2	<0.2	NA	< 0.2	105%	90%	110%	95%	90%	110%			
Arsenic Dissolved	8596507		<0.1	<0.1	NA	< 0.1	97%	90%	110%	96%	90%	110%			
Barium Dissolved	8596507		11.9	13.0	8.7%	< 0.2	102%	90%	110%	100%	90%	110%			
Beryllium Dissolved	8596507		<0.01	<0.01	NA	< 0.01	100%	90%	110%	94%	90%	110%			
Bismuth Dissolved	8596507		<0.05	<0.05	NA	< 0.05				100%	90%	110%			
Boron Dissolved	8596507		90	97	8.3%	< 2	96%	90%	110%	96%	90%	110%			
Cadmium Dissolved	8596507		<0.01	<0.01	NA	< 0.01	106%	90%	110%	100%	90%	110%			
Calcium Dissolved	8596507		8660	8620	0.5%	< 50	102%	90%	110%	101%	90%	110%			
Chromium Dissolved	8596507		<0.5	<0.5	NA	< 0.5	99%	90%	110%	99%	90%	110%			
Cobalt Dissolved	8596507		0.07	0.10	NA	< 0.05	91%	90%	110%	93%	90%	110%			
Copper Dissolved	8596507		0.7	0.8	NA	< 0.2	91%	90%	110%	92%	90%	110%			
Iron Dissolved	8596507		228	226	0.9%	< 10	101%	90%	110%	103%	90%	110%			
Lead Dissolved	8596507		<0.05	0.05	NA	< 0.05	99%	90%	110%	93%	90%	110%			
Lithium Dissolved	8596507		2.4	2.7	12.3%	< 0.5				98%	90%	110%			
Magnesium Dissolved	8596507		14200	14300	0.6%	< 50	101%	90%	110%	99%	90%	110%			
Manganese Dissolved	8596507		35	35	0.7%	< 1	104%	90%	110%	103%	90%	110%			
Mercury Dissolved	8600572		<0.01	<0.01	NA	< 0.01	91%	90%	110%	101%	90%	110%			
Molybdenum Dissolved	8596507		0.53	0.63	17.8%	< 0.05	108%	90%	110%	109%	90%	110%			
Nickel Dissolved	8596507		<0.2	<0.2	NA	< 0.2	99%	90%	110%	92%	90%	110%			
Potassium Dissolved	8596507		5860	5670	3.3%	< 50	97%	90%	110%	109%	90%	110%			
Selenium Dissolved	8596507		<0.5	<0.5	NA	< 0.5	99%	90%	110%	100%	90%	110%			
Silicon Dissolved	8596507		1510	1500	0.8%	< 50				105%	90%	110%			
Silver Dissolved	8596507		<0.02	<0.02	NA	< 0.02				100%	90%	110%			
Sodium Dissolved	8596507		141000	140000	0.6%	< 50	98%	90%	110%	101%	90%	110%			
Strontium Dissolved	8596507		132	115	13.7%	< 0.1	91%	90%	110%	105%	90%	110%			
Sulphur Dissolved	8596507		11500	11200	2.1%	< 500				101%	90%	110%			
Thallium Dissolved	8596507		0.01	<0.01	NA	< 0.01	103%	90%	110%	101%	90%	110%			
Tin Dissolved	8596507		<0.05	<0.05	NA	< 0.05				97%	90%	110%			
Titanium Dissolved	8596507		1.3	2.3	NA	< 0.5				94%	90%	110%			
Uranium Dissolved	8596507		0.08	0.09	2.1%	< 0.01	95%	90%	110%	99%	90%	110%			
Vanadium Dissolved	8596507		0.9	1.1	NA	< 0.5	104%	90%	110%	101%	90%	110%			
Zinc Dissolved	8596507		2	5	NA	< 2	95%	90%	110%	94%	90%	110%			
Zirconium Dissolved	8596507		<0.1	<0.1	NA	< 0.1				117%	70%	130%			

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Chloride in Water															
Chloride	8598956		0.05	0.06	NA	< 0.05	104%	90%	110%	94%	90%	110%			

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Water Analysis (Continued)

RPT Date: Aug 04, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
British Columbia CSR - Schedule 6 Total Metals															
Aluminum Total	8596479		177	183	3.6%	< 5	110%	85%	115%	97%	90%	110%			
Antimony Total	8596479		<0.5	<0.5	NA	< 0.5	101%	85%	115%	99%	90%	110%			
Arsenic Total	8596479		0.3	0.3	NA	< 0.1	97%	85%	115%	97%	90%	110%			
Barium Total	8596479		49.1	49.2	0.2%	< 0.5	103%	85%	115%	106%	90%	110%			
Beryllium Total	8596479		<0.05	<0.05	NA	< 0.05	104%	85%	115%	99%	90%	110%			
Boron Total	8596479		<5	<5	NA	< 5	113%	85%	115%	105%	90%	110%			
Cadmium Total	8596479		<0.01	<0.01	NA	< 0.01	94%	85%	115%	99%	90%	110%			
Calcium Total	8596479		10900	11800	7.2%	< 50	102%	85%	115%	102%	90%	110%			
Chromium Total	8596479		0.8	0.9	NA	< 0.5	101%	85%	115%	103%	90%	110%			
Cobalt Total	8596479		1.26	1.45	14.5%	< 0.05	112%	85%	115%	104%	90%	110%			
Copper Total	8596479		1.4	1.5	NA	< 0.5	106%	85%	115%	104%	90%	110%			
Iron Total	8596479		15100	15900	5.0%	< 10	102%	85%	115%	103%	90%	110%			
Lead Total	8596479		0.12	0.13	NA	< 0.05	111%	85%	115%	103%	90%	110%			
Lithium Total	8596479		<0.5	<0.5	NA	< 0.5				98%	90%	110%			
Magnesium Total	8596479		735	788	6.9%	< 50	103%	85%	115%	103%	90%	110%			
Manganese Total	8596479		560	600	6.9%	< 1	104%	85%	115%	103%	90%	110%			
Mercury Total	8598956		0.04	0.04	NA	< 0.01	97%	85%	115%	104%	90%	110%			
Molybdenum Total	8596479		0.3	0.3	NA	< 0.1	100%	85%	115%	99%	90%	110%			
Nickel Total	8596479		2.1	2.3	NA	< 0.5	107%	85%	115%	104%	90%	110%			
Potassium Total	8596479		1480	1600	7.4%	< 100	94%	85%	115%	102%	90%	110%			
Selenium Total	8596479		<0.5	<0.5	NA	< 0.5	96%	85%	115%	103%	90%	110%			
Silver Total	8596479		<0.02	<0.02	NA	< 0.02				101%	90%	110%			
Sodium Total	8596479		24700	26100	5.6%	< 100	97%	85%	115%	101%	90%	110%			
Thallium Total	8596479		<0.02	<0.02	NA	< 0.02	103%	85%	115%	104%	90%	110%			
Titanium Total	8596479		2	2	NA	< 1				103%	90%	110%			
Uranium Total	8596479		0.04	0.04	NA	< 0.01	107%	85%	115%	97%	90%	110%			
Vanadium Total	8596479		2	2	NA	< 1	101%	85%	115%	104%	90%	110%			
Zinc Total	8596479		<5	<5	NA	< 5	102%	85%	115%	103%	90%	110%			

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

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Method Summary

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PROJECT: 1657709/5000

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Aluminum	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Antimony	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Arsenic	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Barium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Beryllium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Bismuth	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Cadmium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Calcium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Chromium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Cobalt	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Copper	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Iron	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Lead	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Lithium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Magnesium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Manganese	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP-MS
Mercury	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Molybdenum	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Nickel	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Phosphorus	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Potassium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Selenium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Silver	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Sodium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Strontium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP-MS
Thallium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Tin	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Titanium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Uranium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Vanadium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Zinc	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Zirconium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
pH 1:2	INOR-181-6031	BC MOE Lab Manual B (pH, Electrometric, Soil)	PH METER
Chloride, Soluble	LAB-181-4022, INOR-181-6023	BC MOE Lab Manual Section B	COLORIMETER
Sodium, Soluble	LAB-181-4022, MET-181-6106	BC MOE Lab Manual Section B	ICP/OES
Saturation Percentage	LAB-181-4022	BC MOE Lab Manual Section B	GRAVIMETRIC

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AGAT WORK ORDER: 17N243343
PROJECT: 1657709/5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Naphthalene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
2-Methylnaphthalene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
1-Methylnaphthalene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthylene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluorene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Phenanthrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Chrysene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(b)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(j)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(k)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Indeno(1,2,3-c,d)pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Dibenzo(a,h)anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(g,h,i)perylene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Quinoline	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
IACR CCME (Soil)	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
B[a]P TPE (Soil)	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
EPH C10-C19	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
EPH C19-C32	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
LEPH C10-C19	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
HEPH C19-C32	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
Naphthalene - d8	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS

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Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
2-Fluorobiphenyl	ORG-180-5102	Modified form BCMOE Lab Manual Section D (PAH)	GC/MS
P-Terphenyl - d14	ORG-180-5102	Modified form BCMOE Lab Manual Section D (PAH)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Benzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Toluene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Ethylbenzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
m&p-Xylene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
o-Xylene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Styrene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
VPH	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
VH	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Bromofluorobenzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Dibromofluoromethane	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Toluene - d8	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Benzene - Leachable	ORG-180-5130, ORG-180-5135	BC Lab Manual section D, and EPA 1311	GC/MS/FID
Toluene - Leachable	ORG-180-5130, ORG-180-5135	BC Lab Manual section D, and EPA 1311	GC/MS/FID
Ethylbenzene - Leachable	ORG-180-5130, ORG-180-5135	BC Lab Manual section D, and EPA 1311	GC/MS/FID
F2 (C10-C16)	ORG-180-5134	CCME Tier 1 Method	GC/FID
F3 (C16-C34)	ORG-180-5134	CCME Tier 1 Method	GC/FID
F4 (C34-C50)	ORG-180-5134	CCME Tier 1 Method	GC/FID
Propylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Monoethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Diethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Triethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Tetraethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Heptanol	TO-1410	EPA SW-846 8015	GC/FID
Diethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Quinoline	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthylene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluorene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Phenanthrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Anthracene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acridine	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Pyrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)anthracene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Chrysene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(b)fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(j)fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(k)fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)pyrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Indeno(1,2,3-c,d)pyrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Dibenzo(a,h)anthracene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(g,h,i)perylene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
1-Methylnaphthalene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
2-Methylnaphthalene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
EPH C10-C19	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
EPH C19-C32	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
LEPH C10-C19	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
HEPH C19-C32	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
Naphthalene - d8			GC/MS
2-Fluorobiphenyl	ORG-180-5133	Modified form BCMOE Lab Manual Section D (PAH)	GC/MS
P-Terphenyl - d14	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Chloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Vinyl Chloride	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromomethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichlorofluoromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Acetone	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
1,1-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dichloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
2-Butanone (MEK)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,2-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,2-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroform	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1-Trichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Carbon Tetrachloride	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Benzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloropropane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromodichloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,3-Dichloropropene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
4-Methyl-2-pentanone (MIBK)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,3-Dichloropropene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2-Trichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromochloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylene Dibromide	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Tetrachloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1,2-Tetrachloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylbenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
m&p-Xylene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromoform	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Styrene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2,2-Tetrachloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
o-Xylene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,3-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,4-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2,4-Trichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromofluorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromofluoromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene - d8	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
VH	ORG-180-5103	Modified from BC MOE Lab Manual Sec D (VOC)	GC/MS/FID
VPH	ORG-180-5103	Modified from BC MOE Lab Manual Sec D (VOC)	GC/MS/FID
Chloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Vinyl Chloride	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromomethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichlorofluoromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Acetone	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dichloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
2-Butanone (MEK)	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,2-Dichloroethylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,2-Dichloroethylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroform	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1-Trichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Carbon Tetrachloride	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Benzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloropropane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichloroethene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromodichloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,3-Dichloropropene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
4-Methyl-2-pentanone (MIBK)	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,3-Dichloropropene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2-Trichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromochloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylene Dibromide	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Tetrachloroethene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1,2-Tetrachloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
Chlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylbenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
m&p-Xylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromoform	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Styrene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2,2-Tetrachloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
o-Xylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,3-Dichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,4-Dichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2,4-Trichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromofluorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromofluoromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene - d8	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
VH	ORG-180-5133	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS/FID
VPH	ORG-180-5131	Modified from BC MOE Lab Manual Sec D (VOC)	GC/MS/FID

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Aluminum Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Antimony Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Arsenic Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Barium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Beryllium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Boron Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Cadmium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Calcium Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Chromium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Cobalt Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Copper Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Iron Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Lead Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Lithium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Magnesium Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Manganese Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Mercury Total	MET-181-6103	Modified from EPA 245.7	CV/AA
Molybdenum Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Nickel Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Potassium Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Selenium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Silver Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Sodium Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Thallium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Titanium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Uranium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Vanadium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Zinc Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS

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http://www.agatlabs.com

Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Chloride	INOR-181-6002	Modified from SM 4110 B	ION CHROMATOGRAPH
Aluminum Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Antimony Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Arsenic Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Barium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Beryllium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Bismuth Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Boron Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Cadmium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Calcium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Chromium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Cobalt Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Copper Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Iron Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Lead Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Lithium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Magnesium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Manganese Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Mercury Dissolved	MET-181-6103, LAB-181-4015	Modified from EPA 245.7	CV/AA
Molybdenum Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Nickel Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Potassium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Selenium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Silicon Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Silver Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Sodium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Strontium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Sulphur Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N243343

PROJECT: 1657709/5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Thallium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Tin Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Titanium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Uranium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Vanadium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Zinc Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Zirconium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03765 page 1 of 1

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number:			Laboratory Name: AGAT
Short Title:	Golder Contact:		Address:
Golder E-mail Address 1: @golder.com	Golder E-mail Address 2: @golder.com		Telephone/Fax: 778-	Contact:

Office Name:

EQuIS Facility Code:
EQuIS upload: ☐

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Regular (5 Days)
Criteria: ☐ CSR ☐ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	BTEX/VPH									RUSH (Select TAT above)	Remarks (over)
03765 - 01			-	WG				-	-	10	X	X	X	X	X						8598915
- 02			-					-	-	9	X	X	X		X						916
- 03			-					-	-	9	X	X	X	X	X						917
- 04			-							5	X	X	X	X	X						918
03765 - 05			-					FD	03765-04	9	X	X	✓	X	X						919
- 06																					
- 07																					
- 08																					
- 09																					
- 10																					
- 11																					
- 12																					

Sampler's Signature	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments:	Method of Shipment:	Waybill No.:	Received for Lab by: S.Naper	Date	Time	
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C) 5	Cooler opened by: S.Naper	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy

ESED

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03836 page 2 of 6

Golder Associates
200 - 2920 Virtual Way
Vancouver British Columbia Canada V5M 0C4
Telephone (604) 296 4200 Fax (604) 298-5253

Project Number: 1657769/5000
Short Title: K2 Fuels Inc
Golder Contact: Eric Obern
Golder E-mail Address 1: @golder.com
Golder E-mail Address 2: @golder.com
Laboratory Name: ALS-Kam
Address:
Telephone/Fax:
Contact:

Office Name: Vancouver
EQuIS Facility Code: 28733859
EQuIS upload: ☐
Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Regular (5 Days)
Criteria: ☒ CSR ☐ CCME ☐ BC Water Quality ☐ Other
Note: Final Reports to be issued by e-mail
Quote No.:

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Analyses Required: Metals	LEPH/HEPH/PAH	BTEX/VPH	VOC	Silt Marcl Paste	RUSH (Select TAT above)	Remarks (over)
03836 - 01		1	0.0-0.5	Soil	27/07/17	13:05	Discrete			6	X			X			8598920
- 02		2	1.5-1.8			13:10				3							921
- 03		3	3.0-3.5			13:20				5		X					922
- 04		4	4.5-5.0			13:40				3		X					923
- 05		5	6.0-6.5			14:00				5		X	X				924
- 06		1	0.0-0.5			15:00				6	X			X			925
- 07		2	1.5-2.1			15:10				3							926
- 08		3	3.5-4.0			15:20	FD	FOR 03836-01		5		X	X	X			927
- 09		3A	3.5-4.0			15:20	FD	FD 03836-08		5		X	X				928
- 10		4	5.0-5.5			15:30				3		X					929
- 11		5	6.5-7.0			15:40				3							930
- 12		6	10.5-11.0			16:00				5		X	X				931

Sampler's Signature:
Relinquished by: Signature: Kelly
Company: Golder
Date: July 27/17
Time: 17:30
Received by: Signature:
Company: ALS

Comments: Invoice to Accounts Payable
Method of Shipment:
Shipped by:
Waybill No.:
Shipment Condition: Seal Intact
Received for Lab: S.Napier
Temp (°C): 5
Cooler opened by: S.Napier
Date: 2017/07/26
Time:
Date:
Time:

WHITE: Golder Copy YELLOW: Lab Copy

ESED

Added July 28 SB

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. U38371 page 3 of 6

Golder Associates

200 - 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 167 R/SCC
Short Title: RM Fuel Line
Golder Contact: E. Cobb
Golder E-mail Address 1: @golder.com
Golder E-mail Address 2: @golder.com

Laboratory Name: AGAT
Address:
Telephone/Fax:
Contact:

Office Name:

EQuIS Facility Code: 283355
EQuIS upload:

Turnaround Time Criteria: [ ] 24 hr [ ] 48 hr [ ] 72 hr [X] Regular (5 Days)
[X] CSR [ ] CCME [ ] BC Water Quality [ ] Other

Note: Final Reports to be issued by e-mail

Quote No:

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Analyses Required: Metals	LEPH/HEPH/PAH	BTEX/VPH VOC	Cond + Na+Cl	RUSH (Select TAT above)	Remarks (over)
- 01	KM-MW126	7	11.0-11.3	So.	24/07/17	16:30	Discrete			5		X	X			8598932
- 02	KM-MW127	1	0.3-0.5		24/07/17	09:50				6	X			X		933
- 03		2	1.7-2.0			10:00				3						934
- 04		3	3.0-3.5			10:10				4						935
- 05		4	4.5-5.0			10:30				3		X				936
- 06		5	6.0-6.5			11:00				3			XX			937
- 07		6	7.5-8.0			11:30				3						938
- 08		7	8.0-8.5			11:50				5		X	XX			939
- 09	KM-MW128	1	0.3-0.5			13:50		FDA 038340		5	X			X		940
- 10		1	0.3-0.5			13:50		FD 038309		5	X			X		941
- 11		2	1.5-1.8			14:10				3						942
- 12		3	3.0-3.5			14:20				3						943

Sampler's Signature:	Relinquished by: Signature	Company: GOLDER	Date: July 26/17	Time: 9:30	Received by: Signature	Company: AGAT		
Comments:	Method of Shipment:	Waybill No:	Received for Lab by: S.Naper	Date: 2017/07/26	Time:			
	Shipped by:	Shipment Condition: Seal Intact	Temp. (C): 5	Cooler opened by: S.Naper	Date:	Time:		

WHITE: Golder Copy YELLOW: Lab Copy

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CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03638 page 4 of 6

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709
Short Title: KM Field In
Golder Contact: Erin O'Brien
Golder E-mail Address 1: @golder.com
Golder E-mail Address 2: @golder.com
Laboratory Name: AGAT
Address:
Telephone/Fax:
Contact: Maggie

Office Name: Vancouver
EQuIS Facility Code: 28433059
EQuIS upload: X
Turnaround Time Criteria: X SR ☐ CCME ☐ 48 hr ☐ BC Water Quality ☐ 72 hr ☐ Other ☐ Regular (5 Days)
Note: Final Reports to be issued by e-mail
Quote No.:

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers
03638 - 01	KM-MW23-17	4	5.0-5.5	S	23/07/17	14:30	Dissolved			3
- 02		5	6.5-7.0			14:40				3
- 03		6	8.0-8.5			15:05				3
- 04	KM-MW24-17	1	0.3-0.5			14:30				3
- 05		2	2.0-2.5			14:40				3
- 06		3	2.5-2.8		24/07/17	14:50				5
- 07		4	3.4-3.7			15:10	FD	FD 03638-08		5
- 08		4	3.4-3.7			15:10	FD	FD 03638-07		5
- 09		5	4.8-5.1			15:30				3
- 10		6	5.3-5.5			15:50				3
- 11	KM-MW25-17	1	0.3-0.5		25/07/17	14:30				5
- 12		2	1.5-2.0			14:40				3

Analyses Required: Metals, Leach/Hg, BTEX/VPH, VOC, Salt pack, Glycols, BTEX - leachate

RUSH (Select TAT above)

Remarks (over): 8598944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955

added July 28 EOD

Sampler's Signature:	Relinquished by: Signature	Company: GOLDER	Date: July 26/17	Time: 9:36	Received by: Signature	Company: AGAT
Comments: Invoice Dave Osgathorpe	Method of Shipment:	Waybill No:	Received for Lab by: S.Naper		Date: 2017/07/26	Time:
	Shipped by:	Shipment Condition: Seal intact	Temp. (°C): 5	Cooler opened by: S.Naper	Date:	Time:

WHITE: Golder Copy YELLOW: Lab Copy

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CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03844 page 5 of 6

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number:		Laboratory Name:	
Short Title:	Golder Contact:	Address:	
Golder E-mail Address 1: @golder.com	Golder E-mail Address 2: @golder.com	Telephone/Fax:	Contact:

Office Name:

EQuIS Facility Code:
EQuIS upload: ☑

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☑ Regular (5 Days)
Criteria: ☑ CSR ☑ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Analyses Required								RUSH (Select TAT above)	Remarks (over)
03844 - 01										13	✓	✓	✓	✓	✓	✓	✓			8598956
- 02										13	✓	✓	✓	✓	✓	✓	✓			957
- 03										12	✓	✓	✓	✓	✓		✓			958
- 04			5.0	WG		16:30				12	✓	✓		✓	✓	✓				959
- 05																				
- 06																				
- 07																				
- 08																				
- 09																				
- 10																				
- 11																				
- 12																				

Sampler's Signature:	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
Comments:	Method of Shipment:	Waybill No.:	Received for Lab by: S.Naper	Date		Time
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C) 5	Cooler opened by: S.Naper	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy

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CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03845 page 6 of 6

Golder Associates
200 - 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709 / 5000
Short Title: K19 Field Inv.
Golder Contact: Erin O'Brien
Golder E-mail Address 1: erin_o'brien @golder.com
Golder E-mail Address 2: linda_kemp @golder.com

Laboratory Name: AGAT
Address: 120-8600 Glenlyon Pkwy, Burnaby BC
Telephone/Fax: (778) 452-4000
Contact: Maggie Chan

Office Name: Vancouver - Virtual Way
EQuIS Facility Code: 28433859
EQuIS upload: ✓

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ✓ Regular (5 Days)
Criteria: ✓ CSR ✓ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail
Quote No:

Sample Control Number (SCN)	Sample Location	Sa #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Analyses Required: Metals	LEPH/HEPH/PAH	BTEX / VPH	VOC	RUSH (Select TAT above)	Remarks (over)
03845-01	K19-HA17-06	1	0.5	So	23/07/17		Discrete			5	X	X				8598960
-02	↓	2	1.0		↓					5						961
-03		3	1.5							5			X	X		↓ 962
-04																
-05																
-06																
-07																
-08																
-09																
-10																
-11																
-12																

Sampler's Signature	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company	
	Rob Hall	Golder	July 27/17	9:30		AGAT	
Comments: Invoice Dave Osguthorpe	Method of Shipment:	Waybill No:	Received for Lab by: S. Nagar	Date: 2017/01/26	Time:		
	Shipped by:	Shipment Condition: Seal Intact	Temp. (C): 5	Condition (if no): S. Nagar	Date:	Time:	

WHITE: Golder Copy YELLOW: Lab Copy

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AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM - BURNABY

Work Order # 17N243343

RECEIVING BASICS:
Received From: Postnau Waybill #: _____

SAMPLE QUANTITIES:
Coolers: 5 Containers: 283

TIME SENSITIVE ISSUES:
Earliest Date Sampled: 22-Jul-17 ALREADY EXCEEDED? Yes No

NON-CONFORMANCES:
3 temperatures of samples* and average of each cooler: (record differing temperatures on the CoC next to sample ID's) *use jars when available

(1) 9 + 8 + 8 = 8 °C (2) 6 + 5 + 8 = 7 °C (3) 4 + 5 + 5 = 5 °C (4) 4 + 5 + 4 = 4 °C

Was ice or ice pack present: (Yes) No 5) 6+5+5 = 5 °C

Integrity Issues:

Account Project Manager: _____ have they been notified of the above issues: Yes No

Whom spoken to: _____ Date and Time: _____

ADDITIONAL NOTES:

Sample 03765-06 received but not listed on CoC

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM

RECEIVING BASICS - Shipping

Company/Consultant: GOLDER

Courier: _____ (Prepaid) Collect

Waybill#_____

Branch: EDM GP (FN) FM RD VAN LYD FSJ EST Other:_____

Custody Seal Intact: Yes (No) NA

TAT: <24hr 24-48hr 48-72hr Reg Other_____

Cooler Quantity:_____

TIME SENSITIVE ISSUES - Shipping

ALREADY EXCEEDED HOLD TIME? Yes No

Inorganic Tests (Please Circle): Mibi , BOD , Nitrate/Nitrite , Turbidity , Microtox , Ortho PO4 , Tedlar Bag , Residual Chlorine , Chlorophyll* , Chloroamines*

Earliest Expiry:_____

Hydrocarbons: Earliest Expiry _____

SAMPLE INTEGRITY - Shipping

Hazardous Samples: YES NO Precaution Taken:_____

Legal Samples: Yes No

International Samples: Yes No

Tape Sealed: Yes No

Coolant Used: Icepack Bagged Ice Free Ice Free Water None

Temperature (Bottles/Jars only) N/A if only Soil Bags Received

FROZEN (Please Circle if samples received Frozen)

1 (Bottle/Jar) 4+2+9=5 °C 2(Bottle/Jar) 0+3+5=4 °C

3 (Bottle/Jar) 9+10+7=5 °C 4 (Bottle/Jar) 7+3+5=15 °C

5 (Bottle/Jar) 4+5+5=5 °C 6 (Bottle/Jar)___+___+___=___ °C

7 (Bottle/Jar)___+___+___=___ °C 8 (Bottle/Jar)___+___+___=___ °C

9 (Bottle/Jar)___+___+___=___ °C 10 (Bottle/Jar)___+___+___=___ °C

(If more than 10 coolers are received use another sheet of paper and attach)

LOGISTICS USE ONLY

Workorder No: _____

Samples Damaged: Yes No If YES why?

No Bubble Wrap Frozen Courier

Other: _____

Account Project Manager:_____have they been notified of the above issues: Yes No

Whom spoken to: _____ Date/Time: _____

CPM Initial_____

General Comments: _____

_____

_____

_____

_____

* Subcontracted Analysis (See CPM)

Date issued: May 22, 2015

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM

RECEIVING BASICS - Shipping

Company/Consultant: Public Works and Government Services

Courier: Purolator Prepaid Collect

Waybill# 331122789729

Branch: EDM GP FN FM RD (VAN) LYD FSJ EST Other:____

If multiple sites were submitted at once: Yes (No)

Custody Seal Intact: Yes No (NA)

TAT: <24hr 24-48hr 48-72hr (Reg) Other_____

Cooler Quantity: 1

TIME SENSITIVE ISSUES - Shipping

ALREADY EXCEEDED HOLD TIME? Yes No

Inorganic Tests (Please Circle): Mibi , BOD , Nitrate/Nitrite , Turbidity , Microtox , Ortho PO4 , Tedlar Bag , Residual Chlorine , Chlorophyll* , Chloroamines*

Earliest Expiry:_____

Hydrocarbons: Earliest Expiry _____

SAMPLE INTEGRITY - Shipping

Hazardous Samples: YES (NO) Precaution Taken:_____

Legal Samples: Yes (No)

International Samples: Yes (No)

Tape Sealed: Yes (No)

Coolant Used: (Icepack) Bagged Ice Free Ice Free Water None

Temperature (Bottles/Jars only) N/A if only Soil Bags Received

FROZEN (Please Circle if samples received Frozen)

1 (Bottle/Jar) 8.8 + 8.8 + 8.8 = 8.8 °C

2(Bottle/Jar)___+___+___=____ °C

3 (Bottle/Jar)___+___+___=____ °C

4 (Bottle/Jar)___+___+___=____ °C

5 (Bottle/Jar)___+___+___=____ °C

6 (Bottle/Jar)___+___+___=____ °C

7 (Bottle/Jar)___+___+___=____ °C

8 (Bottle/Jar)___+___+___=____ °C

9 (Bottle/Jar)___+___+___=____ °C

10 (Bottle/Jar)___+___+___=____ °C

(If more than 10 coolers are received use another sheet of paper and attach)

LOGISTICS USE ONLY

Workorder No: _____

Samples Damaged: Yes No If YES why?

No Bubble Wrap Frozen Courier

Other: _____

Account Project Manager: _____ have they been notified of the above issues: Yes No

Whom spoken to: _____ Date/Time: _____

CPM Initial_____

General Comments: _____

* Subcontracted Analysis (See CPM)

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
219-800 BURRARD ST
VANCOUVER, BC V6Z 0B9
604-671-1831

ATTENTION TO: Erin O'Brien

PROJECT: 1657709/5000

AGAT WORK ORDER: 17N243826

SOIL ANALYSIS REVIEWED BY: Jennifer Liu, Analyst, Qualified Person

TRACE ORGANICS REVIEWED BY: Andrew Garrard, B.Sc., General Manager

WATER ANALYSIS REVIEWED BY: Andrew Garrard, B.Sc., General Manager

DATE REPORTED: Aug 31, 2017

PAGES (INCLUDING COVER): 68

VERSION*: 4

Should you require any information regarding this analysis please contact your client services representative at (778) 452-4000

*NOTES

VERSION 4: Sample receipt temperature 3°C.

Version 4 issued on September 22, 2017 to report additional SWEP metals as requested by Erin O'Brien of Golder. Version 4 is an amendment to all previous versions.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Metals in Soil

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: 03839-05	03839-11	03846-03	03846-07	03847-02	03847-03
				SAMPLE TYPE: Soil	Soil	Soil	Soil	Soil	Soil
				DATE SAMPLED: 2017-07-26	2017-07-26	2017-07-26	2017-07-27	2017-07-27	2017-07-27
				8601386	8601404	8601418	8601423	8601469	8601470
Aluminum	µg/g		10	14700	8860	9580	10100	7890	13000
Antimony	µg/g		0.1	0.7	0.6	0.6	0.5	0.4	0.5
Arsenic	µg/g		0.1	13.9	10.5	12.0	11.0	7.5	13.7
Barium	µg/g		0.5	476	371	164	466	152	193
Beryllium	µg/g		0.1	0.9	0.6	0.5	0.6	0.4	0.5
Bismuth	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	µg/g		0.01	0.41	0.26	0.19	0.16	0.22	0.27
Calcium	µg/g		10	3480	9720	2490	3590	9000	18500
Chromium	µg/g		1	26	16	16	16	13	16
Cobalt	µg/g		0.1	17.7	7.7	8.5	7.2	5.7	7.7
Copper	µg/g		0.2	31.7	22.2	14.8	19.0	14.0	24.9
Iron	µg/g		10	24800	19800	20700	29100	17300	32300
Lead	µg/g		0.1	13.9	14.9	13.0	11.5	13.3	13.9
Lithium	µg/g		0.5	15.9	9.9	10.1	10.3	6.6	8.3
Magnesium	µg/g		10	3990	3450	2380	2730	2220	7070
Manganese	µg/g		1	746	280	304	278	219	342
Mercury	µg/g		0.01	0.06	0.03	0.03	0.03	0.03	0.04
Molybdenum	µg/g		0.2	1.8	1.8	1.2	1.0	1.3	1.4
Nickel	µg/g		0.5	43.1	26.2	17.9	22.8	12.3	18.4
Phosphorus	µg/g		5	635	640	556	711	539	937
Potassium	µg/g		5	1830	1170	1280	1350	1030	1710
Selenium	µg/g		0.1	0.9	0.9	0.6	0.6	0.5	0.6
Silver	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sodium	µg/g		5	71	64	42	52	47	82
Strontium	µg/g		1	43	31	19	20	23	22
Thallium	µg/g		0.1	0.2	0.1	0.1	0.1	0.1	0.1
Tin	µg/g		0.2	0.7	0.4	0.4	0.4	0.4	0.5
Titanium	µg/g		1	42	18	21	22	30	54
Uranium	µg/g		0.2	1.2	1.1	0.7	0.8	0.7	0.8
Vanadium	µg/g		1	49	32	32	31	31	38

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Certificate of Analysis

AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Metals in Soil

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

SAMPLE DESCRIPTION:				03839-05	03839-11	03846-03	03846-07	03847-02	03847-03
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2017-07-26	2017-07-26	2017-07-26	2017-07-27	2017-07-27	2017-07-27
Parameter	Unit	G / S	RDL	8601386	8601404	8601418	8601423	8601469	8601470
Zinc	µg/g		1	119	105	83	81	57	91
Zirconium	µg/g		0.1	3.4	2.0	0.6	0.8	0.4	0.3
pH 1:2	pH units		0.05	6.39	7.99	6.34	7.12	6.99	7.23

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8601386-8601470 Results are based on the dry weight of the sample

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AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Soil Analysis - (SWEP) NO2,NO3, Cyanide, Fluoride

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

				SAMPLE DESCRIPTION:	03847-02	03847-08
				SAMPLE TYPE:	Soil	Soil
				DATE SAMPLED:	2017-07-27	2017-07-27
Parameter	Unit	G / S	RDL		8601469	8601475
Fluoride - Leachate (SWEP)	mg/L	150	0.5		<0.5	<0.5
Nitrate - Leachate (SWEP)	mg/L	1000	0.5		<0.5	<0.5
Nitrite - Leachate (SWEP)	mg/L	1000	0.5		<0.5	<0.5
Cyanide - Leachate (SWEP)	mg/L	20	0.002		<0.002	<0.002

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to NORTHERN ROCKIES
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8601469-8601475 Analysis based on 'as received'.
Analysis performed at AGAT Calgary.

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AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Soil Analysis - SWEP Metals

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:		03847-02	03847-03
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2017-07-27	2017-07-27
Parameter	Unit	G / S	RDL	8601469	8601470
Arsenic - Leachate (SWEP)	mg/L	2.5	0.5	<0.5	<0.5
Barium - Leachate (SWEP)	mg/L	100	0.5	<0.5	<0.5
Boron - Leachate (SWEP)	mg/L	500	0.5	<0.5	<0.5
Cadmium - Leachate (SWEP)	mg/L	0.5	0.5	<0.5	<0.5
Chromium - Leachate (SWEP)	mg/L	5	0.5	<0.5	<0.5
Copper - Leachate (SWEP)	mg/L	100	0.5	<0.5	<0.5
Lead - Leachate (SWEP)	mg/L	5	0.5	<0.5	<0.5
Mercury - Leachate (SWEP)	mg/L	0.1	0.1	<0.1	<0.1
Selenium - Leachate (SWEP)	mg/L	1	0.5	<0.5	<0.5
Silver - Leachate (SWEP)	mg/L	5	0.5	<0.5	<0.5
Uranium - Leachate (SWEP)	mg/L	10	0.5	<0.5	<0.5
Zinc - Leachate (SWEP)	mg/L	500	0.5	<0.5	<0.5

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to SILVERBERRY LANDFILL
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8601469 Analysis based on 'as received'.
Analysis performed at AGAT Calgary.

8601470 Analysis based on 'as received'.

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PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Soil Salinity - Na & Cl

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:		03839-05	03839-11	03846-03	03846-07	03847-02	03847-03
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-26	2017-07-26	2017-07-26	2017-07-27	2017-07-27	2017-07-27
Parameter	Unit	G / S	RDL	8601386	8601404	8601418	8601423	8601469	8601470
Chloride, Soluble	mg/L		2	<2	7	3	5	25	26
Sodium, Soluble	mg/L		2	4	9	<2	3	10	10
Saturation Percentage	%		0.1	57	49	48	46	47	44
Chloride, Soluble (mg/kg)	mg/kg		2	<2	3	<2	2	12	11
Sodium, Soluble (mg/kg)	mg/kg		2	2	4	<2	<2	5	4

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

SAMPLE DESCRIPTION:				03839-01		03839-04		03839-05	03839-07		03839-09
SAMPLE TYPE:				Soil		Soil		Soil	Soil		Soil
DATE SAMPLED:				2017-07-25		2017-07-25		2017-07-26	2017-07-26		2017-07-26
Parameter	Unit	G / S	RDL	8601360	RDL	8601377	RDL	8601386	8601394	RDL	8601397
Naphthalene	µg/g		0.005	0.304	0.05	1.77	0.005	0.008	0.228	0.05	1.22
2-Methylnaphthalene	µg/g		0.05	1.30	0.05	2.64	0.005	0.010	0.764	0.05	2.17
1-Methylnaphthalene	µg/g		0.05	0.93	0.05	1.93	0.005	0.009	0.528	0.05	1.53
Acenaphthylene	µg/g		0.005	<0.005	0.005	<0.005	0.005	<0.005	<0.005	0.005	<0.005
Acenaphthene	µg/g		0.005	<0.005	0.005	<0.005	0.005	<0.005	<0.005	0.005	<0.005
Fluorene	µg/g		0.02	0.17	0.02	0.23	0.02	<0.02	0.13	0.02	0.21
Phenanthrene	µg/g		0.02	0.52	0.02	0.61	0.02	0.02	0.36	0.02	0.55
Anthracene	µg/g		0.004	<0.004	0.004	<0.004	0.004	<0.004	<0.004	0.004	<0.004
Fluoranthene	µg/g		0.01	0.05	0.01	0.06	0.01	<0.01	0.04	0.01	0.05
Pyrene	µg/g		0.01	0.09	0.01	0.10	0.01	0.01	0.06	0.01	0.10
Benzo(a)anthracene	µg/g		0.03	<0.03	0.03	<0.03	0.03	<0.03	<0.03	0.03	<0.03
Chrysene	µg/g		0.05	0.14	0.05	0.12	0.05	<0.05	0.09	0.05	0.11
Benzo(b)fluoranthene	µg/g		0.05	0.07	0.05	0.07	0.05	<0.05	0.05	0.05	0.06
Benzo(j)fluoranthene	µg/g		0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05	0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05	0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	0.04	0.03	0.04	0.03	<0.03	0.03	0.03	0.03
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	0.02	0.02	0.02	0.02	<0.02	<0.02	0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.005	<0.005	0.005	0.007	0.005	0.011	0.006	0.005	0.006
Benzo(g,h,i)perylene	µg/g		0.05	0.27	0.05	0.26	0.05	<0.05	0.18	0.05	0.23
Quinoline	µg/g		0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05	0.05	<0.05
IACR CCME (Soil)	µg/g		0.6	1.0	0.6	1.0	0.6	0.6	0.8	0.6	0.9
B[a]P TPE (Soil)	µg/g		0.05	0.06	0.05	0.06	0.05	<0.05	0.05	0.05	0.05
EPH C10-C19	µg/g		20	98	20	80	20	<20	66	20	80
EPH C19-C32	µg/g		20	122	20	78	20	25	80	20	81
LEPH C10-C19	µg/g		20	97	20	77	20	<20	65	20	79
HEPH C19-C32	µg/g		20	121	20	77	20	25	80	20	81
Benzo(b+j)fluoranthene	µg/g		0.05	0.07	0.05	0.07	0.05	<0.05	0.05	0.05	0.06

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Certificate of Analysis

AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:	03839-01	03839-04	03839-05	03839-07	03839-09
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	2017-07-25	2017-07-25	2017-07-26	2017-07-26	2017-07-26
Surrogate	Unit	Acceptable Limits	8601360	8601377	8601386	8601394	8601397
Naphthalene - d8	%	50-130	95	93	92	92	92
2-Fluorobiphenyl	%	50-130	94	95	94	91	88
P-Terphenyl - d14	%	60-130	103	107	116	103	91

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Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:		03839-10		03839-11	03846-01		03846-02	03846-06
		SAMPLE TYPE:		Soil		Soil	Soil		Soil	Soil
		DATE SAMPLED:		2017-07-26		2017-07-26	2017-07-26		2017-07-26	2017-07-26
Parameter	Unit	G / S	RDL	8601399	RDL	8601404	8601416	RDL	8601417	8601422
Naphthalene	µg/g		0.05	1.53	0.005	0.011	0.029	0.005	0.428	0.123
2-Methylnaphthalene	µg/g		0.05	2.47	0.005	0.028	0.086	0.05	1.47	1.00
1-Methylnaphthalene	µg/g		0.05	1.78	0.005	0.031	0.074	0.05	0.95	0.57
Acenaphthylene	µg/g		0.005	<0.005	0.005	<0.005	<0.005	0.005	<0.005	<0.005
Acenaphthene	µg/g		0.005	<0.005	0.005	<0.005	<0.005	0.005	<0.005	<0.005
Fluorene	µg/g		0.02	0.23	0.02	<0.02	0.03	0.02	0.20	0.08
Phenanthrene	µg/g		0.02	0.60	0.02	0.07	0.19	0.02	0.51	0.67
Anthracene	µg/g		0.004	<0.004	0.004	<0.004	<0.004	0.004	<0.004	<0.004
Fluoranthene	µg/g		0.01	0.06	0.01	<0.01	0.03	0.01	0.03	0.06
Pyrene	µg/g		0.01	0.10	0.01	0.02	0.07	0.01	0.07	0.11
Benzo(a)anthracene	µg/g		0.03	<0.03	0.03	<0.03	<0.03	0.03	<0.03	<0.03
Chrysene	µg/g		0.05	0.12	0.05	0.08	0.14	0.05	0.11	0.16
Benzo(b)fluoranthene	µg/g		0.05	0.06	0.05	0.06	0.07	0.05	0.06	0.08
Benzo(j)fluoranthene	µg/g		0.05	<0.05	0.05	<0.05	<0.05	0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	0.05	<0.05	<0.05	0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	0.04	0.03	<0.03	<0.03	0.03	0.03	0.04
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	0.02	<0.02	<0.02	0.02	<0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.005	0.006	0.005	0.017	0.005	0.005	0.006	0.011
Benzo(g,h,i)perylene	µg/g		0.05	0.25	0.05	0.08	0.15	0.05	0.15	0.23
Quinoline	µg/g		0.05	<0.05	0.05	<0.05	<0.05	0.05	<0.05	<0.05
IACR CCME (Soil)	µg/g		0.6	0.9	0.6	0.9	0.9	0.6	0.9	1.1
B[a]P TPE (Soil)	µg/g		0.05	0.06	0.05	<0.05	<0.05	0.05	0.05	0.07
EPH C10-C19	µg/g		20	84	20	<20	221	20	82	120
EPH C19-C32	µg/g		20	85	20	98	347	20	97	130
LEPH C10-C19	µg/g		20	82	20	<20	221	20	81	119
HEPH C19-C32	µg/g		20	85	20	98	347	20	97	130
Benzo(b+j)fluoranthene	µg/g		0.05	0.06	0.05	0.06	0.07	0.05	0.06	0.08

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Certificate of Analysis

AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:	03839-10	03839-11	03846-01	03846-02	03846-06
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	2017-07-26	2017-07-26	2017-07-26	2017-07-26	2017-07-26
Surrogate	Unit	Acceptable Limits	8601399	8601404	8601416	8601417	8601422
Naphthalene - d8	%	50-130	95	103	96	89	91
2-Fluorobiphenyl	%	50-130	93	108	88	82	90
P-Terphenyl - d14	%	60-130	102	118	94	82	104

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CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

SAMPLE DESCRIPTION:				03846-09	03846-10		03846-12	03847-02	03847-03		03847-05
SAMPLE TYPE:				Soil	Soil		Soil	Soil	Soil		Soil
DATE SAMPLED:				2017-07-27	2017-07-27		2017-07-27	2017-07-27	2017-07-27		2017-07-27
Parameter	Unit	G / S	RDL	8601425	8601427	RDL	8601431	8601469	8601470	RDL	8601472
Naphthalene	µg/g		0.005	0.121	0.151	0.05	0.94	1.17	1.01	0.005	0.022
2-Methylnaphthalene	µg/g		0.005	0.544	0.657	0.05	1.73	3.76	3.29	0.005	0.045
1-Methylnaphthalene	µg/g		0.005	0.401	0.468	0.05	1.21	1.71	1.44	0.005	0.028
Acenaphthylene	µg/g		0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	0.005	<0.005
Acenaphthene	µg/g		0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	0.005	<0.005
Fluorene	µg/g		0.02	0.03	0.03	0.02	0.20	0.13	0.10	0.02	<0.02
Phenanthrene	µg/g		0.02	0.47	0.50	0.02	0.62	0.19	0.13	0.02	0.06
Anthracene	µg/g		0.004	<0.004	<0.004	0.004	<0.004	<0.004	<0.004	0.004	<0.004
Fluoranthene	µg/g		0.01	0.05	0.05	0.01	0.05	0.01	0.01	0.01	<0.01
Pyrene	µg/g		0.01	0.09	0.08	0.01	0.11	0.01	0.01	0.01	<0.01
Benzo(a)anthracene	µg/g		0.03	<0.03	<0.03	0.03	<0.03	<0.03	<0.03	0.03	<0.03
Chrysene	µg/g		0.05	0.12	0.12	0.05	0.15	<0.05	<0.05	0.05	<0.05
Benzo(b)fluoranthene	µg/g		0.05	0.07	0.09	0.05	0.07	<0.05	<0.05	0.05	<0.05
Benzo(j)fluoranthene	µg/g		0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	0.03	0.03	0.03	0.04	<0.03	<0.03	0.03	<0.03
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.005	0.010	0.011	0.005	0.007	<0.005	<0.005	0.005	0.005
Benzo(g,h,i)perylene	µg/g		0.05	0.18	0.18	0.05	0.21	<0.05	<0.05	0.05	<0.05
Quinoline	µg/g		0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	0.05	<0.05
IACR CCME (Soil)	µg/g		0.6	1.0	1.1	0.6	1.0	<0.6	<0.6	0.6	<0.6
B[a]P TPE (Soil)	µg/g		0.05	0.05	0.06	0.05	0.06	<0.05	<0.05	0.05	<0.05
EPH C10-C19	µg/g		20	61	64	20	120	374	308	20	39
EPH C19-C32	µg/g		20	82	81	20	120	400	318	20	72
LEPH C10-C19	µg/g		20	60	63	20	118	372	307	20	39
HEPH C19-C32	µg/g		20	82	80	20	120	400	318	20	72
Benzo(b+j)fluoranthene	µg/g		0.05	0.07	0.09	0.05	0.07	<0.05	<0.05	0.05	<0.05

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Certificate of Analysis

AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:	03846-09	03846-10	03846-12	03847-02	03847-03	03847-05
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	2017-07-27	2017-07-27	2017-07-27	2017-07-27	2017-07-27	2017-07-27
Surrogate	Unit	Acceptable Limits	8601425	8601427	8601431	8601469	8601470	8601472
Naphthalene - d8	%	50-130	85	78	54	86	106	70
2-Fluorobiphenyl	%	50-130	84	78	59	89	111	70
P-Terphenyl - d14	%	60-130	103	99	90	100	107	98

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PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:		03847-07	03847-08	03847-10
		SAMPLE TYPE:		Soil	Soil	Soil
		DATE SAMPLED:		2017-07-27	2017-07-27	2017-07-27
Parameter	Unit	G / S	RDL	8601474	8601475	8601477
Naphthalene	µg/g		0.005	0.387	0.471	0.016
2-Methylnaphthalene	µg/g		0.005	0.119	0.190	0.064
1-Methylnaphthalene	µg/g		0.005	0.108	0.144	0.067
Acenaphthylene	µg/g		0.005	<0.005	<0.005	<0.005
Acenaphthene	µg/g		0.005	0.012	<0.005	<0.005
Fluorene	µg/g		0.02	<0.02	<0.02	0.05
Phenanthrene	µg/g		0.02	0.07	0.07	0.28
Anthracene	µg/g		0.004	<0.004	<0.004	<0.004
Fluoranthene	µg/g		0.01	<0.01	<0.01	0.04
Pyrene	µg/g		0.01	0.01	0.01	0.08
Benzo(a)anthracene	µg/g		0.03	<0.03	<0.03	<0.03
Chrysene	µg/g		0.05	<0.05	<0.05	0.14
Benzo(b)fluoranthene	µg/g		0.05	<0.05	<0.05	0.07
Benzo(j)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	<0.03	<0.03	0.03
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	<0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.005	0.005	0.005	0.007
Benzo(g,h,i)perylene	µg/g		0.05	<0.05	<0.05	0.15
Quinoline	µg/g		0.05	<0.05	<0.05	<0.05
IACR CCME (Soil)	µg/g		0.6	<0.6	<0.6	1.0
B[a]P TPE (Soil)	µg/g		0.05	<0.05	<0.05	0.05
EPH C10-C19	µg/g		20	61	77	79
EPH C19-C32	µg/g		20	66	82	100
LEPH C10-C19	µg/g		20	60	76	79
HEPH C19-C32	µg/g		20	66	82	100
Benzo(b+j)fluoranthene	µg/g		0.05	<0.05	<0.05	0.07

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Certificate of Analysis

AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:	03847-07	03847-08	03847-10
		SAMPLE TYPE:	Soil	Soil	Soil
		DATE SAMPLED:	2017-07-27	2017-07-27	2017-07-27
Surrogate	Unit	Acceptable Limits	8601474	8601475	8601477
Naphthalene - d8	%	50-130	73	92	98
2-Fluorobiphenyl	%	50-130	74	94	101
P-Terphenyl - d14	%	60-130	101	103	106

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8601360-8601377 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
PAH detection limits increased due to sample dilution.

8601386 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.

8601394-8601399 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
PAH detection limits increased due to sample dilution.

8601404-8601416 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.

8601417 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
PAH detection limits increased due to sample dilution.

8601422 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
PAH detection limits increased due to sample dilution.

8601425-8601427 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.

8601431-8601470 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
PAH detection limits increased due to sample dilution.

8601472-8601477 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.

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AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

BTEX / VPH (C6-C10) Soil

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:		03839-04	03839-09	03839-10	03846-02	03846-10	03846-12	03847-03	03847-05
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-25	2017-07-26	2017-07-26	2017-07-26	2017-07-27	2017-07-27	2017-07-27	2017-07-27
Parameter	Unit	G / S	RDL	8601377	8601397	8601399	8601417	8601427	8601431	8601470	8601472
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g		0.05	0.34	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	µg/g		0.05	0.44	0.24	0.11	<0.05	<0.05	0.07	0.11	<0.05
m&p-Xylene	µg/g		0.05	1.21	0.71	0.34	<0.05	<0.05	0.22	0.22	<0.05
o-Xylene	µg/g		0.05	0.60	0.34	0.16	<0.05	<0.05	0.10	0.06	<0.05
Styrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
VPH	µg/g		10	35	31	27	20	11	21	17	<10
VH	µg/g		10	38	32	28	20	11	22	17	<10
Total Xylenes	ug/g		0.1	1.8	1.1	0.5	<0.1	<0.1	0.3	0.3	<0.1
Surrogate	Unit	Acceptable Limits									
Bromofluorobenzene	%	60-140		105	112	114	113	109	117	121	108
Dibromofluoromethane	%	60-140		100	104	110	110	109	110	120	106
Toluene - d8	%	60-140		122	128	125	125	126	136	124	117

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AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

BTEX / VPH (C6-C10) Soil

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:		03847-10
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2017-07-27
Parameter	Unit	G / S	RDL	8601477
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1
Benzene	µg/g		0.02	0.08
Toluene	µg/g		0.05	<0.05
Ethylbenzene	µg/g		0.05	<0.05
m&p-Xylene	µg/g		0.05	<0.05
o-Xylene	µg/g		0.05	<0.05
Styrene	µg/g		0.05	<0.05
VPH	µg/g		10	<10
VH	µg/g		10	<10
Total Xylenes	ug/g		0.1	<0.1
Surrogate	Unit	Acceptable Limits		
Bromofluorobenzene	%	60-140		115
Dibromofluoromethane	%	60-140		113
Toluene - d8	%	60-140		121

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8601377-8601477 Results are based on dry weight of sample.
VPH results have been corrected for BTEX contributions.

Certified By:

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AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

BTEX / VPH (C6-C10) Water

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:		03797-07
		SAMPLE TYPE:		Water
		DATE SAMPLED:		2017-07-26
Parameter	Unit	G / S	RDL	8601486
Methyl tert-butyl ether (MTBE)	µg/L		1	<1
Benzene	µg/L		0.5	<0.5
Toluene	µg/L		0.5	<0.5
Ethylbenzene	µg/L		0.5	<0.5
m&p-Xylene	µg/L		0.5	<0.5
o-Xylene	µg/L		0.5	<0.5
Styrene	µg/L		0.5	<0.5
VPH	µg/L		100	<100
VH	µg/L		100	<100
Total Xylenes	ug/L		1	<1
Surrogate	Unit	Acceptable Limits		
Bromofluorobenzene	%	70-130		93
Dibromofluoromethane	%	70-130		99
Toluene - d8	%	70-130		115

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8601486 VPH results have been corrected for BTEX contributions.

Certified By:

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AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

BTEX Analysis - Leachate

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:		03847-07
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2017-07-27
Parameter	Unit	G / S	RDL	8601474
Benzene - Leachable	mg/L		0.005	<0.005
Toluene - Leachable	mg/L		0.005	<0.005
Ethylbenzene - Leachable	mg/L		0.005	0.013
Xylenes - Leachable	mg/L		0.005	0.014
Surrogate	Unit	Acceptable Limits		
Bromofluorobenzene	%	70-130		89
Dibromofluoromethane	%	70-130		128
Toluene - d8	%	70-130		89

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8601474 Analysis based on "as received"

Certified By:

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AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Glycols Analysis in Soil

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:		03839-05	03839-11
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2017-07-26	2017-07-26
Parameter	Unit	G / S	RDL	8601386	8601404
Propylene Glycol	mg/kg		10	<10	<10
Monoethylene Glycol	mg/kg		10	<10	<10
Diethylene Glycol	mg/kg		10	<10	<10
Triethylene Glycol	mg/kg		10	<10	<10
Tetraethylene Glycol	mg/kg		10	<10	<10
Surrogate	Unit	Acceptable Limits			
Heptanol	%	50-150		97.8	100

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8601386-8601404 Analysis by GC/FID.
Results are based on the dry weight of the sample.
Analysis performed at AGAT Calgary.

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ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Glycols Analysis in Water

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:		03797-06
		SAMPLE TYPE:		Water
		DATE SAMPLED:		2017-07-26
Parameter	Unit	G / S	RDL	8601485
Propylene Glycol	mg/L		10	<10
Monoethylene Glycol	mg/L		10	<10
Diethylene Glycol	mg/L		5	<5
Triethylene Glycol	mg/L		10	<10
Tetraethylene Glycol	mg/L		10	<10
Surrogate	Unit	Acceptable Limits		
Heptanol	%	50-150		88

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8601485 Identification based on retention time relative to standards.
Analysis performed at AGAT Calgary.

Certified By:

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PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Water Low Level

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:		03797-01	03797-02	03797-03	03797-04	03797-05	03797-06	03797-07	03798-01
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-26	2017-07-26	2017-07-26	2017-07-26	2017-07-26	2017-07-26	2017-07-26	2017-07-27
Parameter	Unit	G / S	RDL	8601479	8601480	8601482	8601483	8601484	8601485	8601486	8601487
Naphthalene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Quinoline	µg/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Acenaphthene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Fluorene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Phenanthrene	µg/L		0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acridine	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Pyrene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(a)anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(j)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenzo(a,h)anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1-Methylnaphthalene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EPH C10-C19	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
EPH C19-C32	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
LEPH C10-C19	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
HEPH C19-C32	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
Benzo(b+j)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Surrogate	Unit	Acceptable Limits									
Naphthalene - d8	%	50-130		72	79	77	78	78	63	66	76
2-Fluorobiphenyl	%	50-130		70	73	73	76	77	71	76	75
P-Terphenyl - d14	%	60-130		66	61	62	69	66	66	66	62

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Certificate of Analysis

AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Water Low Level

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

Certified By:

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SAMPLING SITE:

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Public Works LEPH/HEPH in Water Low Level

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:		03798-02	03798-03	03798-04
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2017-07-27	2017-07-27	2017-07-27
Parameter	Unit	G / S	RDL	8601488	8601489	8601490
Naphthalene	µg/L		0.05	<0.05	<0.05	<0.05
Quinoline	µg/L		0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L		0.02	<0.02	<0.02	<0.02
Acenaphthene	µg/L		0.02	<0.02	<0.02	<0.02
Fluorene	µg/L		0.02	<0.02	<0.02	<0.02
Phenanthrene	µg/L		0.04	<0.04	<0.04	<0.04
Anthracene	µg/L		0.01	<0.01	<0.01	<0.01
Acridine	µg/L		0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/L		0.02	<0.02	<0.02	<0.02
Pyrene	µg/L		0.02	<0.02	<0.02	<0.02
Benzo(a)anthracene	µg/L		0.01	<0.01	<0.01	<0.01
Chrysene	µg/L		0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01
Benzo(j)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/L		0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/L		0.01	<0.01	<0.01	<0.01
Dibenzo(a,h)anthracene	µg/L		0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L		0.01	<0.01	<0.01	<0.01
1-Methylnaphthalene	µg/L		0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	µg/L		0.05	<0.05	<0.05	<0.05
EPH C10-C19	µg/L		100	<100	<100	<100
EPH C19-C32	µg/L		100	<100	<100	<100
LEPH C10-C19	µg/L		100	<100	<100	<100
HEPH C19-C32	µg/L		100	<100	<100	<100
Benzo(b+j)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01
Surrogate	Unit	Acceptable Limits		8601488	8601489	8601490
Naphthalene - d8	%	50-130		79	63	78
2-Fluorobiphenyl	%	50-130		75	61	75
P-Terphenyl - d14	%	60-130		61	60	69

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PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

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Public Works LEPH/HEPH in Water Low Level

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Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8601479-8601490 LEPH & HEPH results have been corrected for PAH contributions.

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CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:		03839-01	03839-07	03846-01	03846-06	03846-09	03847-02	03847-07	03847-08
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-25	2017-07-26	2017-07-26	2017-07-26	2017-07-27	2017-07-27	2017-07-27	2017-07-27
Parameter	Unit	G / S	RDL	8601360	8601394	8601416	8601422	8601425	8601469	8601474	8601475
Chloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vinyl Chloride	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromomethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acetone	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Butanone (MEK)	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroform	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzene	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.30	0.39
1,2-Dichloropropane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethene	µg/g		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromodichloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4-Methyl-2-pentanone (MIBK)	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Toluene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	0.08
Dibromochloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylene Dibromide	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:		03839-01	03839-07	03846-01	03846-06	03846-09	03847-02	03847-07	03847-08
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-25	2017-07-26	2017-07-26	2017-07-26	2017-07-27	2017-07-27	2017-07-27	2017-07-27
Parameter	Unit	G / S	RDL	8601360	8601394	8601416	8601422	8601425	8601469	8601474	8601475
Chlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.12	1.13	1.63
m&p-Xylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.24	0.20	0.22
Bromoform	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
o-Xylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	0.06	0.06
1,3-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
VH	µg/g		10	28	17	<10	24	12	20	36	44
VPH	µg/g		10	27	17	<10	24	12	19	34	42
Total Xylenes	µg/g		0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.3	0.3	0.3
Surrogate	Unit	Acceptable Limits									
Bromofluorobenzene	%	60-140		107	113	107	107	109	118	110	118
Dibromofluoromethane	%	60-140		116	118	109	111	112	118	103	109
Toluene - d8	%	60-140		137	122	122	133	132	130	127	132

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8601360-8601475 Results are based on dry weight of sample.

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CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Water

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:		03797-01	03797-02	03797-03	03797-04	03797-05	03797-06	03798-01	03798-02
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-26	2017-07-26	2017-07-26	2017-07-26	2017-07-26	2017-07-26	2017-07-27	2017-07-27
Parameter	Unit	G / S	RDL	8601479	8601480	8601482	8601483	8601484	8601485	8601487	8601488
Chloromethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl Chloride	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Bromomethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Acetone	µg/L		10	<10	<10	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Dichloromethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Methyl tert-butyl ether (MTBE)	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
2-Butanone (MEK)	µg/L		10	<10	<10	<10	<10	<10	<10	<10	<10
trans-1,2-Dichloroethylene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethylene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Tetrachloride	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
4-Methyl-2-pentanone (MIBK)	µg/L		10	<10	<10	<10	<10	<10	<10	<10	<10
cis-1,3-Dichloropropene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Ethylene Dibromide	µg/L		0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Tetrachloroethene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1

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PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Water

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:		03797-01	03797-02	03797-03	03797-04	03797-05	03797-06	03798-01	03798-02
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-26	2017-07-26	2017-07-26	2017-07-26	2017-07-26	2017-07-26	2017-07-27	2017-07-27
Parameter	Unit	G / S	RDL	8601479	8601480	8601482	8601483	8601484	8601485	8601487	8601488
Chlorobenzene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
m&p-Xylene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
o-Xylene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
VH	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
VPH	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
Total Trihalomethanes	µg/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Total Xylenes	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Surrogate	Unit	Acceptable Limits									
Bromofluorobenzene	%	70-130		94	97	95	94	94	92	92	91
Dibromofluoromethane	%	70-130		91	95	96	97	99	98	102	101
Toluene - d8	%	70-130		112	117	116	115	117	114	116	115

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AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Water

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:		03798-03	03798-04
		SAMPLE TYPE:		Water	Water
		DATE SAMPLED:		2017-07-27	2017-07-27
Parameter	Unit	G / S	RDL	8601489	8601490
Chloromethane	µg/L		1	<1	<1
Vinyl Chloride	µg/L		1	<1	<1
Bromomethane	µg/L		1	<1	<1
Chloroethane	µg/L		1	<1	<1
Trichlorofluoromethane	µg/L		1	<1	<1
Acetone	µg/L		10	<10	<10
1,1-Dichloroethene	µg/L		1	<1	<1
Dichloromethane	µg/L		1	<1	<1
Methyl tert-butyl ether (MTBE)	µg/L		1	<1	<1
2-Butanone (MEK)	µg/L		10	<10	<10
trans-1,2-Dichloroethylene	µg/L		1	<1	<1
1,1-Dichloroethane	µg/L		1	<1	<1
cis-1,2-Dichloroethylene	µg/L		1	<1	<1
Chloroform	µg/L		1	<1	<1
1,2-Dichloroethane	µg/L		1	<1	<1
1,1,1-Trichloroethane	µg/L		1	<1	<1
Carbon Tetrachloride	µg/L		0.5	<0.5	<0.5
Benzene	µg/L		0.5	<0.5	<0.5
1,2-Dichloropropane	µg/L		1	<1	<1
Trichloroethene	µg/L		1	<1	<1
Bromodichloromethane	µg/L		1	<1	<1
trans-1,3-Dichloropropene	µg/L		1	<1	<1
4-Methyl-2-pentanone (MIBK)	µg/L		10	<10	<10
cis-1,3-Dichloropropene	µg/L		1	<1	<1
1,1,2-Trichloroethane	µg/L		1	<1	<1
Toluene	µg/L		0.5	<0.5	<0.5
Dibromochloromethane	µg/L		1	<1	<1
Ethylene Dibromide	µg/L		0.3	<0.3	<0.3
Tetrachloroethene	µg/L		1	<1	<1
1,1,1,2-Tetrachloroethane	µg/L		1	<1	<1

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Certificate of Analysis

AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Water

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:		03798-03	03798-04
		SAMPLE TYPE:		Water	Water
		DATE SAMPLED:		2017-07-27	2017-07-27
Parameter	Unit	G / S	RDL	8601489	8601490
Chlorobenzene	µg/L		1	<1	<1
Ethylbenzene	µg/L		0.5	<0.5	<0.5
m&p-Xylene	µg/L		0.5	<0.5	<0.5
Bromoform	µg/L		1	<1	<1
Styrene	µg/L		0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	µg/L		1	<1	<1
o-Xylene	µg/L		0.5	<0.5	<0.5
1,3-Dichlorobenzene	µg/L		0.5	<0.5	<0.5
1,4-Dichlorobenzene	µg/L		0.5	<0.5	<0.5
1,2-Dichlorobenzene	µg/L		0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	µg/L		1	<1	<1
VH	µg/L		100	<100	<100
VPH	µg/L		100	<100	<100
Total Trihalomethanes	µg/L		2	<2	<2
Total Xylenes	µg/L		1	<1	<1
Surrogate	Unit	Acceptable Limits			
Bromofluorobenzene	%	70-130		91	89
Dibromofluoromethane	%	70-130		103	99
Toluene - d8	%	70-130		116	113

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Chloride in Water

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

SAMPLE DESCRIPTION:				03797-01	03797-02	03797-03	03797-04	03797-05	03797-06	03797-07
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2017-07-26	2017-07-26	2017-07-26	2017-07-26	2017-07-26	2017-07-26	2017-07-26
Parameter	Unit	G / S	RDL	8601479	8601480	8601482	8601483	8601484	8601485	8601486
Chloride	mg/L		0.05	1.97	0.89	0.47	0.45	0.47	0.48	2.18

SAMPLE DESCRIPTION:			03798-01		03798-02	03798-03	03798-04	
SAMPLE TYPE:			Water		Water	Water	Water	
DATE SAMPLED:			2017-07-27		2017-07-27	2017-07-27	2017-07-27	
Parameter	Unit	G / S	RDL	8601487	RDL	8601488	8601489	8601490
Chloride	mg/L		5	1190	0.05	18.0	43.8	1.35

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8601487 Due to matrix interferences sample was diluted for Chloride analysis, detection limits have been adjusted accordingly.

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PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

SAMPLE DESCRIPTION:				03797-01		03797-02		03797-03	03797-04	03797-05	03797-06
SAMPLE TYPE:				Water		Water		Water	Water	Water	Water
DATE SAMPLED:				2017-07-26		2017-07-26		2017-07-26	2017-07-26	2017-07-26	2017-07-26
Parameter	Unit	G / S	RDL	8601479	RDL	8601480	RDL	8601482	8601483	8601484	8601485
Aluminum Dissolved	µg/L		2	<2	2	<2	2	<2	<2	<2	4
Antimony Dissolved	µg/L		0.2	<0.2	0.2	1.8	0.2	<0.2	<0.2	<0.2	<0.2
Arsenic Dissolved	µg/L		0.1	2.5	0.1	1.1	0.1	0.2	0.4	0.4	2.0
Barium Dissolved	µg/L		0.2	111	2	3100	2	187	2040	1930	218
Beryllium Dissolved	µg/L		0.01	<0.01	0.01	<0.01	0.01	0.04	0.01	0.01	0.04
Bismuth Dissolved	µg/L		0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05
Boron Dissolved	µg/L		2	216	2	208	2	116	128	121	165
Cadmium Dissolved	µg/L		0.01	<0.01	0.01	0.01	0.01	0.01	<0.01	<0.01	<0.01
Calcium Dissolved	µg/L		50	37600	50	73600	50	61700	34400	33500	38100
Chromium Dissolved	µg/L		0.5	<0.5	0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5
Cobalt Dissolved	µg/L		0.05	<0.05	0.05	1.98	0.05	0.75	0.41	0.35	0.81
Copper Dissolved	µg/L		0.2	<0.2	0.2	0.3	0.2	1.2	<0.2	<0.2	<0.2
Iron Dissolved	µg/L		10	3360	10	10	10	772	720	738	1870
Lead Dissolved	µg/L		0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05
Lithium Dissolved	µg/L		2.5	135	2.5	115	0.5	70.9	84.7	81.3	94.4
Magnesium Dissolved	µg/L		50	15900	50	22600	50	18500	13100	13100	12100
Manganese Dissolved	µg/L		1	678	1	354	1	689	301	296	456
Mercury Dissolved	µg/L		0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Molybdenum Dissolved	µg/L		0.05	0.44	0.05	8.29	0.05	2.64	0.64	0.50	0.67
Nickel Dissolved	µg/L		0.2	<0.2	0.2	5.5	0.2	1.0	1.7	1.4	0.7
Potassium Dissolved	µg/L		50	1260	50	5000	50	2010	2320	2380	1780
Selenium Dissolved	µg/L		0.5	<0.5	0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5
Silicon Dissolved	µg/L		50	3610	50	4080	50	5430	3690	3530	3890
Silver Dissolved	µg/L		0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02
Sodium Dissolved	µg/L		50	43300	50	15000	50	22000	62000	64100	37500
Strontium Dissolved	µg/L		0.1	509	0.1	588	0.1	349	550	492	391
Sulphur Dissolved	µg/L		500	4130	500	1660	500	3440	612	566	1960
Thallium Dissolved	µg/L		0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Tin Dissolved	µg/L		0.05	<0.05	0.05	0.15	0.05	0.05	0.13	0.12	0.08
Titanium Dissolved	µg/L		0.5	1.2	0.5	1.0	0.5	1.1	0.8	0.8	1.1

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Certificate of Analysis

AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:		03797-01		03797-02		03797-03	03797-04	03797-05	03797-06
		SAMPLE TYPE:		Water		Water		Water	Water	Water	Water
		DATE SAMPLED:		2017-07-26		2017-07-26		2017-07-26	2017-07-26	2017-07-26	2017-07-26
Parameter	Unit	G / S	RDL	8601479	RDL	8601480	RDL	8601482	8601483	8601484	8601485
Uranium Dissolved	µg/L		0.01	0.01	0.01	2.85	0.01	1.17	0.40	0.38	0.44
Vanadium Dissolved	µg/L		0.5	<0.5	0.5	0.8	0.5	<0.5	<0.5	<0.5	<0.5
Zinc Dissolved	µg/L		2	7	2	<2	2	<2	<2	<2	<2
Zirconium Dissolved	µg/L		0.1	<0.1	0.1	0.2	0.1	<0.1	<0.1	<0.1	<0.1
Hardness (calc)	ug CaCO3/L		100	159000	100	277000	100	230000	140000	138000	145000

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SAMPLING SITE:

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DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:		03797-07		03798-01		03798-02		03798-03
		SAMPLE TYPE:		Water		Water		Water		Water
		DATE SAMPLED:		2017-07-26		2017-07-27		2017-07-27		2017-07-27
Parameter	Unit	G / S	RDL	8601486	RDL	8601487	RDL	8601488	RDL	8601489
Aluminum Dissolved	µg/L		2	8	2	46	2	<2	2	4
Antimony Dissolved	µg/L		0.2	0.2	0.2	<0.2	0.2	<0.2	0.2	<0.2
Arsenic Dissolved	µg/L		0.1	0.4	0.1	0.4	0.1	0.2	0.1	0.4
Barium Dissolved	µg/L		0.2	46.1	1.0	805	0.2	61.2	2	517
Beryllium Dissolved	µg/L		0.01	<0.01	0.01	0.12	0.01	0.02	0.01	0.03
Bismuth Dissolved	µg/L		0.05	<0.05	0.05	<0.05	0.05	<0.05	0.05	<0.05
Boron Dissolved	µg/L		2	119	2	113	2	126	2	71
Cadmium Dissolved	µg/L		0.01	0.13	0.01	<0.01	0.01	<0.01	0.01	<0.01
Calcium Dissolved	µg/L		50	97400	250	378000	50	67400	50	43500
Chromium Dissolved	µg/L		0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5
Cobalt Dissolved	µg/L		0.05	5.35	0.05	0.28	0.05	0.35	0.05	0.98
Copper Dissolved	µg/L		0.2	0.3	0.2	<0.2	0.2	<0.2	0.2	<0.2
Iron Dissolved	µg/L		10	64	10	55200	10	1860	10	18600
Lead Dissolved	µg/L		0.05	<0.05	0.05	<0.05	0.05	<0.05	0.05	<0.05
Lithium Dissolved	µg/L		0.5	73.8	2.5	193	0.5	73.7	0.5	62.8
Magnesium Dissolved	µg/L		50	33100	50	115000	50	18300	50	17000
Manganese Dissolved	µg/L		1	667	1	17200	1	792	1	658
Mercury Dissolved	µg/L		0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01
Molybdenum Dissolved	µg/L		0.05	0.92	0.05	<0.05	0.05	0.22	0.05	0.29
Nickel Dissolved	µg/L		0.2	10.9	0.2	0.4	0.2	<0.2	0.2	0.3
Potassium Dissolved	µg/L		50	2590	50	4070	50	2100	50	1520
Selenium Dissolved	µg/L		0.5	1.4	0.5	<0.5	0.5	<0.5	0.5	<0.5
Silicon Dissolved	µg/L		50	3870	50	7830	50	5260	50	5860
Silver Dissolved	µg/L		0.02	<0.02	0.02	<0.02	0.02	<0.02	0.02	<0.02
Sodium Dissolved	µg/L		50	16300	50	25800	50	20100	50	8970
Strontium Dissolved	µg/L		0.1	389	0.5	2250	0.1	602	0.1	214
Sulphur Dissolved	µg/L		500	47500	500	6030	500	12200	500	1370
Thallium Dissolved	µg/L		0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01
Tin Dissolved	µg/L		0.05	<0.05	0.05	0.06	0.05	0.16	0.05	0.09
Titanium Dissolved	µg/L		0.5	0.9	0.5	2.0	0.5	1.0	0.5	1.9

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PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:		03797-07		03798-01		03798-02		03798-03
		SAMPLE TYPE:		Water		Water		Water		Water
		DATE SAMPLED:		2017-07-26		2017-07-27		2017-07-27		2017-07-27
Parameter	Unit	G / S	RDL	8601486	RDL	8601487	RDL	8601488	RDL	8601489
Uranium Dissolved	µg/L		0.01	1.83	0.01	0.10	0.01	0.37	0.01	0.15
Vanadium Dissolved	µg/L		0.5	0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5
Zinc Dissolved	µg/L		2	2	2	<2	2	<2	2	<2
Zirconium Dissolved	µg/L		0.1	0.2	0.1	<0.1	0.1	<0.1	0.1	<0.1
Hardness (calc)	ug CaCO3/L		100	380000	100	1420000	100	244000	100	179000

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Public Works Dissolved Metals

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

		SAMPLE DESCRIPTION:		03798-04
		SAMPLE TYPE:		Water
		DATE SAMPLED:		2017-07-27
Parameter	Unit	G / S	RDL	8601490
Aluminum Dissolved	µg/L		2	<2
Antimony Dissolved	µg/L		0.2	0.3
Arsenic Dissolved	µg/L		0.1	0.2
Barium Dissolved	µg/L		0.2	98.9
Beryllium Dissolved	µg/L		0.01	0.01
Bismuth Dissolved	µg/L		0.05	<0.05
Boron Dissolved	µg/L		2	105
Cadmium Dissolved	µg/L		0.01	<0.01
Calcium Dissolved	µg/L		50	91100
Chromium Dissolved	µg/L		0.5	<0.5
Cobalt Dissolved	µg/L		0.05	0.59
Copper Dissolved	µg/L		0.2	<0.2
Iron Dissolved	µg/L		10	1280
Lead Dissolved	µg/L		0.05	<0.05
Lithium Dissolved	µg/L		0.5	63.3
Magnesium Dissolved	µg/L		50	31700
Manganese Dissolved	µg/L		1	151
Mercury Dissolved	µg/L		0.01	<0.01
Molybdenum Dissolved	µg/L		0.05	5.09
Nickel Dissolved	µg/L		0.2	0.6
Potassium Dissolved	µg/L		50	3290
Selenium Dissolved	µg/L		0.5	<0.5
Silicon Dissolved	µg/L		50	4470
Silver Dissolved	µg/L		0.02	<0.02
Sodium Dissolved	µg/L		50	13900
Strontium Dissolved	µg/L		0.1	440
Sulphur Dissolved	µg/L		500	12300
Thallium Dissolved	µg/L		0.01	<0.01
Tin Dissolved	µg/L		0.05	0.15
Titanium Dissolved	µg/L		0.5	1.1

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SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-07-29

DATE REPORTED: 2017-08-31

			SAMPLE DESCRIPTION:	03798-04
			SAMPLE TYPE:	Water
			DATE SAMPLED:	2017-07-27
Parameter	Unit	G / S	RDL	8601490
Uranium Dissolved	µg/L		0.01	3.57
Vanadium Dissolved	µg/L		0.5	<0.5
Zinc Dissolved	µg/L		2	<2
Zirconium Dissolved	µg/L		0.1	0.1
Hardness (calc)	ug CaCO3/L		100	358000

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8601479-8601480 Due to matrix interferences sample was diluted for metals analysis, detection limits have been adjusted accordingly.

8601487 Due to matrix interferences sample was diluted for metals analysis, detection limits have been adjusted accordingly.

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
AGAT WORK ORDER: 17N243826
PROJECT: 1657709/5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

Soil Analysis

RPT Date: Aug 31, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Public Works Metals in Soil															
Aluminum	8488100		5760	5220	9.9%	< 10	96%	70%	130%	103%	90%	110%			
Antimony	8488100		0.4	0.4	NA	< 0.1	100%	70%	130%	93%	90%	110%			
Arsenic	8488100		5.0	6.3	23.3%	< 0.1	110%	70%	130%	106%	90%	110%			
Barium	8488100		129	169	26.6%	< 0.5	80%	70%	130%	97%	90%	110%			
Beryllium	8488100		0.2	0.2	NA	< 0.1	103%	70%	130%	91%	90%	110%			
Bismuth	8488100		<0.5	<0.5	NA	< 0.5				91%	85%	115%			
Cadmium	8488100		0.15	0.21	35.0%	< 0.01	110%	70%	130%	91%	90%	110%			
Calcium	8488100		25100	27300	8.4%	< 10	98%	70%	130%	101%	90%	110%			
Chromium	8488100		13	14	7.8%	< 1	97%	70%	130%	98%	90%	110%			
Cobalt	8488100		4.0	4.5	10.5%	< 0.1	102%	70%	130%	101%	90%	110%			
Copper	8488100		9.1	9.9	8.3%	< 0.2	99%	70%	130%	102%	90%	110%			
Iron	8488100		12300	12300	0.4%	< 10	95%	70%	130%	98%	90%	110%			
Lead	8488100		3.0	3.5	15.1%	< 0.1	78%	70%	130%	92%	90%	110%			
Lithium	8488100		3.6	4.0	12.8%	< 0.5				93%	85%	115%			
Magnesium	8488100		6520	6630	1.7%	< 10	104%	70%	130%	100%	90%	110%			
Manganese	8488100		216	230	6.3%	< 1	96%	70%	130%	94%	90%	110%			
Mercury	8488100		0.02	0.03	NA	< 0.01	82%	70%	130%	104%	90%	110%			
Molybdenum	8488100		0.9	1.0	NA	< 0.2	85%	70%	130%	96%	90%	110%			
Nickel	8488100		13.3	15.2	12.8%	< 0.5	104%	70%	130%	101%	90%	110%			
Phosphorus	8488100		557	527	5.4%	< 5	112%	70%	130%	109%	90%	110%			
Potassium	8488100		389	427	9.2%	< 5	94%	70%	130%	101%	90%	110%			
Selenium	8488100		0.3	0.2	NA	< 0.1				101%	90%	110%			
Silver	8488100		<0.5	<0.5	NA	< 0.5	122%	70%	130%	94%	90%	110%			
Sodium	8488100		169	163	3.2%	< 5	101%	70%	130%	100%	90%	110%			
Strontium	8488100		69	73	6.1%	< 1	84%	70%	130%	92%	90%	110%			
Thallium	8488100		<0.1	<0.1	NA	< 0.1	84%	70%	130%	90%	90%	110%			
Tin	8488100		<0.2	<0.2	NA	< 0.2	79%	70%	130%	97%	90%	110%			
Titanium	8488100		397	359	9.9%	< 1	117%	70%	130%	101%	90%	110%			
Uranium	8488100		0.4	0.8	NA	< 0.2	108%	70%	130%	96%	90%	110%			
Vanadium	8488100		17	17	4.4%	< 1	97%	70%	130%	97%	90%	110%			
Zinc	8488100		24	27	11.3%	< 1	104%	70%	130%	108%	90%	110%			
Zirconium	8488100		1.7	1.6	8.1%	< 0.1		70%	130%	90%	90%	110%			
pH 1:2	8600344		7.18	7.19	0.1%		96%	90%	110%	101%	95%	105%			
Soil Salinity - Na & Cl															
Chloride, Soluble	8558293		284	252	11.9%	< 2	104%	80%	120%	106%	85%	115%			
Sodium, Soluble	8558293		252	267	5.8%	< 2	85%	80%	120%	96%	85%	115%			
Saturation Percentage			36.9	36.3	1.6%	<	100%	80%	120%						

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
AGAT WORK ORDER: 17N243826
PROJECT: 1657709/5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

Soil Analysis (Continued)

RPT Date: Aug 31, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Soil Analysis - (SWEP) NO2,NO3, Cyanide, Fluoride															
Fluoride - Leachate (SWEP)	8601475	8601475	<0.5	<0.5	NA	< 0.5	104%	80%	120%				110%	80%	120%
Nitrate - Leachate (SWEP)	8601475	8601475	<0.5	<0.5	NA	< 0.5	103%	80%	120%				106%	80%	120%
Nitrite - Leachate (SWEP)	8601475	8601475	<0.5	<0.5	NA	< 0.5	100%	80%	120%				100%	80%	120%
Cyanide - Leachate (SWEP)	8654164		<0.002	<0.002	NA	< 0.002	114%	80%	120%	100%	80%	120%	105%	80%	120%
Soil Analysis - SWEP Metals															
Arsenic - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	86%	80%	120%	115%	80%	120%	108%	80%	120%
Barium - Leachate (SWEP)	8738785		1.0	1.1	NA	< 0.5	92%	80%	120%	111%	80%	120%	NA	80%	120%
Boron - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	77%	80%	120%	101%	80%	120%	NA	80%	120%
Cadmium - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	91%	80%	120%	104%	80%	120%	103%	80%	120%
Chromium - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	92%	80%	120%	106%	80%	120%	104%	80%	120%
Copper - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	92%	80%	120%	108%	80%	120%	108%	80%	120%
Lead - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	91%	80%	120%	101%	80%	120%	100%	80%	120%
Mercury - Leachate (SWEP)	8738785		<0.1	<0.1	NA	< 0.1	96%	80%	120%	97%	80%	120%	108%	80%	120%
Selenium - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	84%	80%	120%	118%	80%	120%	109%	80%	120%
Silver - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	89%	80%	120%	93%	80%	120%	93%	80%	120%
Uranium - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	92%	80%	120%	97%	80%	120%	98%	80%	120%
Zinc - Leachate (SWEP)	8738785		<0.5	<0.5	NA	< 0.5	92%	80%	120%	109%	80%	120%	106%	80%	120%
Soil Analysis - SWEP Metals															
Arsenic - Leachate (SWEP)	8740252		<0.5	<0.5	NA	< 0.5	86%	80%	120%	115%	80%	120%	108%	80%	120%
Barium - Leachate (SWEP)	8740252		<0.5	<0.5	NA	< 0.5	92%	80%	120%	111%	80%	120%	NA	80%	120%
Boron - Leachate (SWEP)	8740252		<0.5	<0.5	NA	< 0.5	94%	80%	120%	101%	80%	120%	NA	80%	120%
Cadmium - Leachate (SWEP)	8740252		<0.5	<0.5	NA	< 0.5	91%	80%	120%	104%	80%	120%	103%	80%	120%
Chromium - Leachate (SWEP)	8740252		<0.5	<0.5	NA	< 0.5	92%	80%	120%	106%	80%	120%	104%	80%	120%
Copper - Leachate (SWEP)	8740252		<0.5	<0.5	NA	< 0.5	92%	80%	120%	108%	80%	120%	108%	80%	120%
Lead - Leachate (SWEP)	8740252		<0.5	<0.5	NA	< 0.5	91%	80%	120%	101%	80%	120%	100%	80%	120%
Mercury - Leachate (SWEP)	8740252		<0.1	<0.1	NA	< 0.1	97%	80%	120%	98%	80%	120%	109%	80%	120%
Selenium - Leachate (SWEP)	8740252		<0.5	<0.5	NA	< 0.5	84%	80%	120%	118%	80%	120%	109%	80%	120%
Silver - Leachate (SWEP)	8740252		<0.5	<0.5	NA	< 0.5	89%	80%	120%	93%	80%	120%	93%	80%	120%
Uranium - Leachate (SWEP)	8740252		<0.5	<0.5	NA	< 0.5	92%	80%	120%	97%	80%	120%	98%	80%	120%
Zinc - Leachate (SWEP)	8740252		<0.5	<0.5	NA	< 0.5	92%	80%	120%	109%	80%	120%	106%	80%	120%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.
With multi element scans it is acceptable for a maximum of 10% (including non-reported elements) of each QC criteria to fail to an absolute maximum of 10%.

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Soil Analysis (Continued)

RPT Date: Aug 31, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

Certified By:

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Trace Organics Analysis

RPT Date: Aug 31, 2017

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Public Works LEPH/HEPH in Soil Low Level															
Naphthalene	67614	8601425	0.121	0.145	18.0%	< 0.005	96%	80%	120%				106%	50%	130%
2-Methylnaphthalene	67614	8601425	0.544	0.630	14.7%	< 0.005	101%	80%	120%				104%	50%	130%
1-Methylnaphthalene	67614	8601425	0.401	0.473	16.5%	< 0.005	99%	80%	120%				107%	50%	130%
Acenaphthylene	67614	8601425	<0.005	<0.005	NA	< 0.005	106%	80%	120%				107%	50%	130%
Acenaphthene	67614	8601425	<0.005	<0.005	NA	< 0.005	103%	80%	120%				112%	50%	130%
Fluorene	67614	8601425	0.03	0.03	NA	< 0.02	104%	80%	120%				103%	50%	130%
Phenanthrene	67614	8601425	0.47	0.49	4.2%	< 0.02	107%	80%	120%				87%	60%	130%
Anthracene	67614	8601425	<0.004	<0.004	NA	< 0.004	98%	80%	120%				120%	60%	130%
Fluoranthene	67614	8601425	0.05	0.05	0.0%	< 0.01	106%	80%	120%				108%	60%	130%
Pyrene	67614	8601425	0.09	0.10	10.5%	< 0.01	104%	80%	120%				119%	60%	130%
Benzo(a)anthracene	67614	8601425	<0.03	<0.03	NA	< 0.03	105%	80%	120%				105%	60%	130%
Chrysene	67614	8601425	0.12	0.13	NA	< 0.05	95%	80%	120%				109%	60%	130%
Benzo(b)fluoranthene	67614	8601425	0.07	0.07	NA	< 0.05	102%	80%	120%				102%	60%	130%
Benzo(j)fluoranthene	67614	8601425	<0.05	<0.05	NA	< 0.05	89%	80%	120%				112%	60%	130%
Benzo(k)fluoranthene	67614	8601425	<0.05	<0.05	NA	< 0.05	89%	80%	120%				104%	60%	130%
Benzo(a)pyrene	67614	8601425	0.03	0.03	NA	< 0.03	94%	80%	120%				101%	60%	130%
Indeno(1,2,3-c,d)pyrene	67614	8601425	<0.02	<0.02	NA	< 0.02	104%	80%	120%				107%	60%	130%
Dibenzo(a,h)anthracene	67614	8601425	0.010	0.011	NA	< 0.005	108%	80%	120%				107%	60%	130%
Benzo(g,h,i)perylene	67614	8601425	0.18	0.18	NA	< 0.05	99%	80%	120%				109%	60%	130%
Quinoline	67614	8601425	<0.05	<0.05	NA	< 0.05	101%	80%	120%				117%	50%	130%
IACR CCME (Soil)	67614	8601425	1.0	1.0	NA	< 0.6									
B[a]P TPE (Soil)	67614	8601425	0.05	0.05	NA	< 0.05									
EPH C10-C19	67614	8601425	61	58	NA	< 20	103%	70%	130%				97%	65%	120%
EPH C19-C32	67614	8601425	82	74	NA	< 20	104%	70%	130%				96%	80%	120%
Naphthalene - d8	67614	8601425	85	96	12.2%		108%	80%	120%				93%	50%	130%
2-Fluorobiphenyl	67614	8601425	84	93	10.2%		96%	80%	120%				97%	50%	130%
P-Terphenyl - d14	67614	8601425	103	102	1.0%		105%	80%	120%				100%	60%	130%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Volatile Organic Compounds in Soil															
Chloromethane	67642	8603776	<0.05	<0.05	NA	< 0.05	98%	80%	120%				110%	60%	140%
Vinyl Chloride	67642	8603776	<0.05	<0.05	NA	< 0.05	98%	80%	120%				109%	60%	140%
Bromomethane	67642	8603776	<0.05	<0.05	NA	< 0.05	86%	80%	120%				107%	60%	140%
Chloroethane	67642	8603776	<0.05	<0.05	NA	< 0.05	99%	80%	120%				109%	60%	140%
Trichlorofluoromethane	67642	8603776	<0.05	<0.05	NA	< 0.05	99%	80%	120%				96%	70%	130%
Acetone	67642	8603776	<0.5	<0.5	NA	< 0.5	101%	80%	120%				103%	70%	130%
1,1-Dichloroethene	67642	8603776	<0.05	<0.05	NA	< 0.05	99%	80%	120%				98%	70%	130%
Dichloromethane	67642	8603776	<0.05	<0.05	NA	< 0.05	100%	80%	120%				106%	70%	130%
Methyl tert-butyl ether (MTBE)	67642	8603776	<0.1	<0.1	NA	< 0.1	101%	80%	120%				96%	70%	130%

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Trace Organics Analysis (Continued)

RPT Date: Aug 31, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
2-Butanone (MEK)	67642	8603776	<0.5	<0.5	NA	< 0.5	101%	80%	120%				101%	70%	130%
trans-1,2-Dichloroethene	67642	8603776	<0.05	<0.05	NA	< 0.05	100%	80%	120%				101%	70%	130%
1,1-Dichloroethane	67642	8603776	<0.05	<0.05	NA	< 0.05	100%	80%	120%				103%	70%	130%
cis-1,2-Dichloroethene	67642	8603776	<0.05	<0.05	NA	< 0.05	100%	80%	120%				101%	70%	130%
Chloroform	67642	8603776	<0.05	<0.05	NA	< 0.05	100%	80%	120%				103%	70%	130%
1,2-Dichloroethane	67642	8603776	<0.05	<0.05	NA	< 0.05	100%	80%	120%				100%	70%	130%
1,1,1-Trichloroethane	67642	8603776	<0.05	<0.05	NA	< 0.05	100%	80%	120%				95%	70%	130%
Carbon Tetrachloride	67642	8603776	<0.02	<0.02	NA	< 0.02	100%	80%	120%				91%	70%	130%
Benzene	67642	8603776	<0.02	<0.02	NA	< 0.02	100%	80%	120%				103%	70%	130%
1,2-Dichloropropane	67642	8603776	<0.05	<0.05	NA	< 0.05	100%	80%	120%				101%	70%	130%
Trichloroethene	67642	8603776	<0.01	<0.01	NA	< 0.01	100%	80%	120%				96%	70%	130%
Bromodichloromethane	67642	8603776	<0.05	<0.05	NA	< 0.05	101%	80%	120%				100%	70%	130%
trans-1,3-Dichloropropene	67642	8603776	<0.05	<0.05	NA	< 0.05	101%	80%	120%				92%	60%	140%
4-Methyl-2-pentanone (MIBK)	67642	8603776	<0.5	<0.5	NA	< 0.5	102%	80%	120%				86%	70%	130%
cis-1,3-Dichloropropene	67642	8603776	<0.05	<0.05	NA	< 0.05	101%	80%	120%				92%	60%	140%
1,1,2-Trichloroethane	67642	8603776	<0.05	<0.05	NA	< 0.05	101%	80%	120%				97%	70%	130%
Toluene	67642	8603776	<0.05	<0.05	NA	< 0.05	100%	80%	120%				99%	70%	130%
Dibromochloromethane	67642	8603776	<0.05	<0.05	NA	< 0.05	101%	80%	120%				96%	70%	130%
Ethylene Dibromide	67642	8603776	<0.05	<0.05	NA	< 0.05	101%	80%	120%				95%	70%	130%
Tetrachloroethene	67642	8603776	<0.05	<0.05	NA	< 0.05	100%	80%	120%				80%	70%	130%
1,1,1,2-Tetrachloroethane	67642	8603776	<0.05	<0.05	NA	< 0.05	101%	80%	120%				101%	70%	130%
Chlorobenzene	67642	8603776	<0.05	<0.05	NA	< 0.05	100%	80%	120%				96%	70%	130%
Ethylbenzene	67642	8603776	<0.05	<0.05	NA	< 0.05	101%	80%	120%				92%	70%	130%
m&p-Xylene	67642	8603776	<0.05	<0.05	NA	< 0.05	100%	80%	120%				93%	70%	130%
Bromoform	67642	8603776	<0.05	<0.05	NA	< 0.05	101%	80%	120%				86%	70%	130%
Styrene	67642	8603776	<0.05	<0.05	NA	< 0.05	101%	80%	120%				92%	70%	130%
1,1,2,2-Tetrachloroethane	67642	8603776	<0.05	<0.05	NA	< 0.05	101%	80%	120%				87%	70%	130%
o-Xylene	67642	8603776	<0.05	<0.05	NA	< 0.05	100%	80%	120%				96%	70%	130%
1,3-Dichlorobenzene	67642	8603776	<0.05	<0.05	NA	< 0.05	100%	80%	120%				96%	70%	130%
1,4-Dichlorobenzene	67642	8603776	<0.05	<0.05	NA	< 0.05	100%	80%	120%				95%	70%	130%
1,2-Dichlorobenzene	67642	8603776	<0.05	<0.05	NA	< 0.05	100%	80%	120%				93%	70%	130%
1,2,4-Trichlorobenzene	67642	8603776	<0.05	<0.05	NA	< 0.05	101%	80%	120%				88%	70%	130%
Bromofluorobenzene	67642	8603776	108	110	1.8%		107%	60%	140%				107%	60%	140%
Dibromofluoromethane	67642	8603776	108	110	1.8%		99%	60%	140%				104%	60%	140%
Toluene - d8	67642	8603776	132	128	3.1%		101%	60%	140%				106%	60%	140%
VH	67642	8603776	<10	<10	NA	< 10									
VPH	67642	8603776	<10	<10	NA	< 10									

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SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Aug 31, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
BTEX / VPH (C6-C10) Soil															
Methyl tert-butyl ether (MTBE)	67642	8601377	<0.1	<0.1	NA	< 0.1	101%	80%	120%				96%	70%	130%
Benzene	67642	8601377	<0.02	<0.02	NA	< 0.02	100%	80%	120%				103%	70%	130%
Toluene	67642	8601377	0.34	0.35	2.9%	< 0.05	100%	80%	120%				99%	70%	130%
Ethylbenzene	67642	8601377	0.44	0.45	2.2%	< 0.05	101%	80%	120%				92%	70%	130%
m&p-Xylene	67642	8601377	1.21	1.26	4.0%	< 0.05	100%	80%	120%				93%	70%	130%
o-Xylene	67642	8601377	0.60	0.63	4.9%	< 0.05	100%	80%	120%				96%	70%	130%
Styrene	67642	8601377	<0.05	<0.05	NA	< 0.05	101%	80%	120%				92%	70%	130%
VPH	67642	8601377	35	35	NA	< 10									
VH	67642	8601377	38	38	NA	< 10									
Bromofluorobenzene	67642	8601377	105	109	3.7%		107%	60%	140%				107%	60%	140%
Dibromofluoromethane	67642	8601377	100	104	3.9%		99%	60%	140%				104%	60%	140%
Toluene - d8	67642	8601377	122	127	4.0%		101%	60%	140%				106%	60%	140%
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
BTEX Analysis - Leachate															
Benzene - Leachable	67617	8598949	<0.005	<0.005	NA	< 0.005	98%	80%	120%				89%	70%	130%
Toluene - Leachable	67617	8598949	<0.005	<0.005	NA	< 0.005	99%	80%	120%				91%	70%	130%
Ethylbenzene - Leachable	67617	8598949	<0.005	<0.005	NA	< 0.005	99%	80%	120%				91%	70%	130%
Bromofluorobenzene	67617	8598949	93	96	3.2%		100%	60%	140%				101%	60%	140%
Dibromofluoromethane	67617	8598949	120	123	2.5%		100%	60%	140%				101%	60%	140%
Toluene - d8	67617	8598949	98	102	4.0%		100%	60%	140%				101%	60%	140%
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
Public Works LEPH/HEPH in Water Low Level															
Naphthalene	67618	W-MS1	0.43	0.43	0.0%	< 0.05	103%	80%	120%				90%	50%	130%
Quinoline	67618	W-MS1	0.5	0.6	18.2%	< 0.1	102%	80%	120%				119%	50%	130%
Acenaphthylene	67618	W-MS1	0.45	0.41	9.3%	< 0.02	102%	80%	120%				90%	50%	130%
Acenaphthene	67618	W-MS1	0.50	0.50	0.0%	< 0.02	102%	80%	120%				100%	50%	130%
Fluorene	67618	W-MS1	0.44	0.44	0.0%	< 0.02	101%	80%	120%				90%	50%	130%
Phenanthrene	67618	W-MS1	0.34	0.34	0.0%	< 0.04	102%	80%	120%				70%	60%	130%
Anthracene	67618	W-MS1	0.43	0.43	0.0%	< 0.01	101%	80%	120%				89%	60%	130%
Acridine	67618	W-MS1	0.56	0.61	8.5%	< 0.05	102%	80%	120%				113%	50%	130%
Fluoranthene	67618	W-MS1	0.43	0.46	6.7%	< 0.02	100%	80%	120%				86%	60%	130%
Pyrene	67618	W-MS1	0.44	0.45	2.2%	< 0.02	100%	80%	120%				90%	60%	130%
Benzo(a)anthracene	67618	W-MS1	0.39	0.38	2.6%	< 0.01	102%	80%	120%				78%	60%	130%
Chrysene	67618	W-MS1	0.46	0.46	0.0%	< 0.01	102%	80%	120%				93%	60%	130%
Benzo(b)fluoranthene	67618	W-MS1	0.34	0.31	9.2%	< 0.01	96%	80%	120%				68%	60%	130%
Benzo(j)fluoranthene	67618	W-MS1	0.56	0.56	0.0%	< 0.01	100%	80%	120%				113%	60%	130%
Benzo(k)fluoranthene	67618	W-MS1	0.37	0.36	2.7%	< 0.01	110%	80%	120%				76%	60%	130%

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
AGAT WORK ORDER: 17N243826
PROJECT: 1657709/5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Aug 31, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Benzo(a)pyrene	67618	W-MS1	0.46	0.45	2.2%	< 0.01	103%	80%	120%				93%	60%	130%
Indeno(1,2,3-c,d)pyrene	67618	W-MS1	0.38	0.36	5.4%	< 0.01	102%	80%	120%				77%	60%	130%
Dibenzo(a,h)anthracene	67618	W-MS1	0.35	0.34	2.9%	< 0.01	102%	80%	120%				71%	60%	130%
Benzo(g,h,i)perylene	67618	W-MS1	0.43	0.42	2.4%	< 0.01	102%	80%	120%				87%	60%	130%
1-Methylnaphthalene	67618	W-MS1	0.43	0.43	0.0%	< 0.05	102%	80%	120%				87%	50%	130%
2-Methylnaphthalene	67618	W-MS1	0.38	0.38	0.0%	< 0.05	101%	80%	120%				78%	50%	130%
EPH C10-C19	67618	W-MS1	8620	9710	11.9%	< 100	103%	70%	130%				82%	70%	130%
EPH C19-C32	67618	W-MS1	14600	16600	12.8%	< 100	98%	70%	130%				86%	70%	130%
Naphthalene - d8	67618	W-MS1	90	87	3.4%		102%	80%	120%				90%	50%	130%
2-Fluorobiphenyl	67618	W-MS1	89	82	8.2%		99%	80%	120%				90%	50%	130%
P-Terphenyl - d14	67618	W-MS1	75	75	0.0%		98%	80%	120%				75%	60%	130%
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
BTEX / VPH (C6-C10) Water															
Methyl tert-butyl ether (MTBE)	67651	8601479	< 1	< 1	NA	< 1	101%	80%	120%				102%	70%	130%
Benzene	67651	8601479	< 0.5	< 0.5	NA	< 0.5	100%	80%	120%				104%	70%	130%
Toluene	67651	8601479	< 0.5	< 0.5	NA	< 0.5	100%	80%	120%				104%	70%	130%
Ethylbenzene	67651	8601479	< 0.5	< 0.5	NA	< 0.5	101%	80%	120%				96%	70%	130%
m&p-Xylene	67651	8601479	< 0.5	< 0.5	NA	< 0.5	101%	80%	120%				96%	70%	130%
o-Xylene	67651	8601479	< 0.5	< 0.5	NA	< 0.5	101%	80%	120%				97%	70%	130%
Styrene	67651	8601479	< 0.5	< 0.5	NA	< 0.5	101%	80%	120%				96%	70%	130%
VPH	67651	8601479	< 100	< 100	NA	< 100									
VH	67651	8601479	< 100	< 100	NA	< 100									
Bromofluorobenzene	67651	8601479	94	96	2.1%		107%	70%	130%				111%	70%	130%
Dibromofluoromethane	67651	8601479	91	94	3.2%		99%	70%	130%				104%	70%	130%
Toluene - d8	67651	8601479	112	115	2.6%		101%	70%	130%				113%	70%	130%
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
Glycols Analysis in Soil															
Propylene Glycol	112	8607030	<10	<10	NA	< 10	116%	70%	130%	86%	70%	130%	115%	60%	140%
Monoethylene Glycol	112	8607030	30	40	NA	< 10	111%	70%	130%	86%	70%	130%	112%	60%	140%
Diethylene Glycol	112	8607030	<10	<10	NA	< 10	113%	70%	130%	86%	70%	130%	112%	60%	140%
Triethylene Glycol	112	8607030	<10	<10	NA	< 10	110%	70%	130%	84%	70%	130%	108%	60%	140%
Tetraethylene Glycol	112	8607030	<10	<10	NA	< 10	107%	70%	130%	76%	70%	130%	91%	60%	140%
Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.															
Glycols Analysis in Water															
Propylene Glycol	112	8601485	<10	<10	NA	< 10	112%	70%	130%	106%	70%	130%	123%	60%	140%
Monoethylene Glycol	112	8601485	<10	<10	NA	< 10	110%	70%	130%	98%	70%	130%	111%	60%	140%
Diethylene Glycol	112	8601485	<5	<5	NA	< 5	110%	70%	130%	106%	70%	130%	116%	60%	140%
Triethylene Glycol	112	8601485	<10	<10	NA	< 10	107%	70%	130%	103%	70%	130%	113%	60%	140%

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Quality Assurance

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AGAT WORK ORDER: 17N243826
PROJECT: 1657709/5000
ATTENTION TO: Erin O'Brien
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Trace Organics Analysis (Continued)

RPT Date: Aug 31, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Tetraethylene Glycol	112	8601485	<10	<10	NA	< 10	104%	70%	130%	97%	70%	130%	107%	60%	140%
Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.															
Volatile Organic Compounds in Water															
Chloromethane	67651	8601479	<1	<1	NA	< 1	98%	80%	120%				94%	70%	130%
Vinyl Chloride	67651	8601479	<1	<1	NA	< 1	98%	80%	120%				99%	70%	130%
Bromomethane	67651	8601479	<1	<1	NA	< 1	86%	80%	120%				87%	70%	130%
Chloroethane	67651	8601479	<1	<1	NA	< 1	99%	80%	120%				103%	70%	130%
Trichlorofluoromethane	67651	8601479	<1	<1	NA	< 1	99%	80%	120%				100%	70%	130%
Acetone	67651	8601479	<10	<10	NA	< 10	101%	80%	120%						
1,1-Dichloroethene	67651	8601479	<1	<1	NA	< 1	99%	80%	120%				102%	70%	130%
Dichloromethane	67651	8601479	<1	<1	NA	< 1	100%	80%	120%				101%	70%	130%
Methyl tert-butyl ether (MTBE)	67651	8601479	<1	<1	NA	< 1	101%	80%	120%				102%	70%	130%
2-Butanone (MEK)	67651	8601479	<10	<10	NA	< 10	101%	80%	120%						
trans-1,2-Dichloroethylene	67651	8601479	<1	<1	NA	< 1	100%	80%	120%				104%	70%	130%
1,1-Dichloroethane	67651	8601479	<1	<1	NA	< 1	100%	80%	120%				99%	70%	130%
cis-1,2-Dichloroethylene	67651	8601479	<1	<1	NA	< 1	100%	80%	120%				99%	70%	130%
Chloroform	67651	8601479	<1	<1	NA	< 1	100%	80%	120%				101%	70%	130%
1,2-Dichloroethane	67651	8601479	<1	<1	NA	< 1	100%	80%	120%				101%	70%	130%
1,1,1-Trichloroethane	67651	8601479	<1	<1	NA	< 1	100%	80%	120%				100%	70%	130%
Carbon Tetrachloride	67651	8601479	<0.5	<0.5	NA	< 0.5	100%	80%	120%				101%	70%	130%
Benzene	67651	8601479	<0.5	<0.5	NA	< 0.5	100%	80%	120%				104%	70%	130%
1,2-Dichloropropane	67651	8601479	<1	<1	NA	< 1	100%	80%	120%				103%	70%	130%
Trichloroethene	67651	8601479	<1	<1	NA	< 1	100%	80%	120%				103%	70%	130%
Bromodichloromethane	67651	8601479	<1	<1	NA	< 1	101%	80%	120%				105%	70%	130%
trans-1,3-Dichloropropene	67651	8601479	<1	<1	NA	< 1	101%	80%	120%				106%	70%	130%
4-Methyl-2-pentanone (MIBK)	67651	8601479	<10	<10	NA	< 10	102%	80%	120%						
cis-1,3-Dichloropropene	67651	8601479	<1	<1	NA	< 1	101%	80%	120%				102%	70%	130%
1,1,2-Trichloroethane	67651	8601479	<1	<1	NA	< 1	101%	80%	120%				104%	70%	130%
Toluene	67651	8601479	<0.5	<0.5	NA	< 0.5	100%	80%	120%				104%	70%	130%
Dibromochloromethane	67651	8601479	<1	<1	NA	< 1	101%	80%	120%				104%	70%	130%
Ethylene Dibromide	67651	8601479	<0.3	<0.3	NA	< 0.3	101%	80%	120%				106%	70%	130%
Tetrachloroethene	67651	8601479	<1	<1	NA	< 1	100%	80%	120%				83%	70%	130%
1,1,1,2-Tetrachloroethane	67651	8601479	<1	<1	NA	< 1	101%	80%	120%				105%	70%	130%
Chlorobenzene	67651	8601479	<1	<1	NA	< 1	100%	80%	120%				93%	70%	130%
Ethylbenzene	67651	8601479	<0.5	<0.5	NA	< 0.5	101%	80%	120%				96%	70%	130%
m&p-Xylene	67651	8601479	<0.5	<0.5	NA	< 0.5	100%	80%	120%				96%	70%	130%
Bromoform	67651	8601479	<1	<1	NA	< 1	101%	80%	120%				92%	70%	130%
Styrene	67651	8601479	<0.5	<0.5	NA	< 0.5	101%	80%	120%				96%	70%	130%
1,1,2,2-Tetrachloroethane	67651	8601479	<1	<1	NA	< 1	101%	80%	120%				88%	70%	130%

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Quality Assurance

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AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Aug 31, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
o-Xylene	67651	8601479	<0.5	<0.5	NA	< 0.5	100%	80%	120%				97%	70%	130%
1,3-Dichlorobenzene	67651	8601479	<0.5	<0.5	NA	< 0.5	100%	80%	120%				97%	70%	130%
1,4-Dichlorobenzene	67651	8601479	<0.5	<0.5	NA	< 0.5	100%	80%	120%				95%	70%	130%
1,2-Dichlorobenzene	67651	8601479	<0.5	<0.5	NA	< 0.5	100%	80%	120%				96%	70%	130%
1,2,4-Trichlorobenzene	67651	8601479	<1	<1	NA	< 1	101%	80%	120%				94%	70%	130%
Bromofluorobenzene	67651	8601479	94	96	2.1%		107%	70%	130%				111%	70%	130%
Dibromofluoromethane	67651	8601479	91	94	3.2%		99%	70%	130%				104%	70%	130%
Toluene - d8	67651	8601479	112	115	2.6%		101%	70%	130%				113%	70%	130%
VH	67651	8601479	<100	<100	NA	< 100									
VPH	67651	8601479	<100	<100	NA	< 100									

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Certified By:

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SAMPLING SITE:

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Water Analysis

RPT Date: Aug 31, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Chloride in Water															
Chloride	8601485	8601485	0.48	0.48	1.8%	< 0.05	104%	90%	110%	96%	90%	110%			
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
Public Works Dissolved Metals															
Aluminum Dissolved	8606771		<2	<2	NA	< 2	94%	90%	110%	94%	90%	110%			
Antimony Dissolved	8606771		<0.2	<0.2	NA	< 0.2	101%	90%	110%	103%	90%	110%			
Arsenic Dissolved	8606771		0.2	0.3	NA	< 0.1	93%	90%	110%	104%	90%	110%			
Barium Dissolved	8606771		110	107	2.9%	< 0.2	98%	90%	110%	96%	90%	110%			
Beryllium Dissolved	8606771		<0.01	<0.01	NA	< 0.01	106%	90%	110%	95%	90%	110%			
Bismuth Dissolved	8606771		<0.05	<0.05	NA	< 0.05				96%	90%	110%			
Boron Dissolved	8606771		20	21	4.8%	< 2	96%	90%	110%	95%	90%	110%			
Cadmium Dissolved	8606771		<0.01	<0.01	NA	< 0.01	94%	90%	110%	97%	90%	110%			
Calcium Dissolved	8606771		65600	68500	4.4%	< 50	98%	90%	110%	98%	90%	110%			
Chromium Dissolved	8606771		<0.5	<0.5	NA	< 0.5	98%	90%	110%	97%	90%	110%			
Cobalt Dissolved	8606771		<0.05	<0.05	NA	< 0.05	104%	90%	110%	96%	90%	110%			
Copper Dissolved	8606771		<0.2	<0.2	NA	< 0.2	103%	90%	110%	93%	90%	110%			
Iron Dissolved	8606771		83	84	0.6%	< 10	100%	90%	110%	100%	90%	110%			
Lead Dissolved	8606771		0.06	0.07	NA	< 0.05	96%	90%	110%	93%	90%	110%			
Lithium Dissolved	8606771		21.3	22.3	4.5%	< 0.5				96%	90%	110%			
Magnesium Dissolved	8606771		32800	32700	0.5%	< 50	103%	90%	110%	101%	90%	110%			
Manganese Dissolved	8606771		91	90	0.4%	< 1	105%	90%	110%	103%	90%	110%			
Mercury Dissolved	8598757		<0.01	<0.01	NA	< 0.01	96%	90%	110%	102%	90%	110%			
Molybdenum Dissolved	8606771		2.58	2.54	1.6%	< 0.05	92%	90%	110%	93%	90%	110%			
Nickel Dissolved	8606771		0.2	0.2	NA	< 0.2	104%	90%	110%	100%	90%	110%			
Potassium Dissolved	8606771		2660	2670	0.3%	< 50	100%	90%	110%	103%	90%	110%			
Selenium Dissolved	8606771		<0.5	<0.5	NA	< 0.5	94%	90%	110%	100%	90%	110%			
Silicon Dissolved	8606771		526	517	1.8%	< 50				103%	90%	110%			
Silver Dissolved	8606771		<0.02	<0.02	NA	< 0.02				99%	90%	110%			
Sodium Dissolved	8606771		6310	6370	0.9%	< 50	109%	90%	110%	107%	90%	110%			
Strontium Dissolved	8606771		174	182	4.3%	< 0.1	90%	90%	110%	105%	90%	110%			
Sulphur Dissolved	8606771		30200	30100	0.6%	< 500				100%	90%	110%			
Thallium Dissolved	8606771		0.01	<0.01	NA	< 0.01	102%	90%	110%	98%	90%	110%			
Tin Dissolved	8606771		0.19	0.20	NA	< 0.05				95%	90%	110%			
Titanium Dissolved	8606771		<0.5	<0.5	NA	< 0.5				90%	90%	110%			
Uranium Dissolved	8606771		0.89	0.90	1.6%	< 0.01	98%	90%	110%	93%	90%	110%			
Vanadium Dissolved	8606771		<0.5	<0.5	NA	< 0.5	100%	90%	110%	97%	90%	110%			
Zinc Dissolved	8606771		<2	<2	NA	< 2	95%	90%	110%	97%	90%	110%			
Zirconium Dissolved	8606771		<0.1	<0.1	NA	< 0.1		90%	110%	90%	70%	130%			

AGAT Laboratories

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date: Aug 31, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Certified By:

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QA Violation

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

ATTENTION TO: Erin O'Brien

RPT Date: Aug 31, 2017

PARAMETER	Sample Id	Sample Description	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
				Lower	Upper		Lower	Upper		Lower	Upper
Soil Analysis - SWEP Metals											
Boron - Leachate (SWEP)		03847-03	77%	80%	120%	101%	80%	120%	NA	80%	120%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.
With multi element scans it is acceptable for a maximum of 10% (including non-reported elements) of each QC criteria to fail to an absolute maximum of 10%.

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Method Summary

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Aluminum	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Antimony	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Arsenic	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Barium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Beryllium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Bismuth	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Cadmium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Calcium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Chromium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Cobalt	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Copper	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Iron	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Lead	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Lithium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Magnesium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Manganese	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP-MS
Mercury	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Molybdenum	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Nickel	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Phosphorus	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Potassium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Selenium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Silver	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Sodium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Strontium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP-MS
Thallium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Tin	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Titanium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Uranium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Vanadium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Zinc	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Zirconium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
pH 1:2	INOR-181-6031	BC MOE Lab Manual B (pH, Electrometric, Soil)	PH METER
Fluoride - Leachate (SWEP)	INST 0425	EPA SW 846-1311 BC SW	IC
Nitrate - Leachate (SWEP)	INST 0425	EPA SW 846-1311 BC SW	IC
Nitrite - Leachate (SWEP)	INST 0425	EPA SW 846-1311 BC SW	IC
Cyanide - Leachate (SWEP)	SOIL 0420; INST 0310	BC Laboratory Manual 2013	CONTINUOUS FLOW ANALYZER
Arsenic - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Barium - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Boron - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Cadmium - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Chromium - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Copper - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Lead - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Mercury - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Selenium - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Silver - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Uranium - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Zinc - Leachate (SWEP)	SOIL 0420 & INST 0140	EPA SW 846-1311/6010 BC SW	ICP/OES
Chloride, Soluble	LAB-181-4022, INOR-181-6023	BC MOE Lab Manual Section B	COLORIMETER
Sodium, Soluble	LAB-181-4022, MET-181-6106	BC MOE Lab Manual Section B	ICP/OES
Saturation Percentage	LAB-181-4022	BC MOE Lab Manual Section B	GRAVIMETRIC

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Naphthalene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
2-Methylnaphthalene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
1-Methylnaphthalene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthylene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluorene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Phenanthrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Chrysene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(b)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(j)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(k)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Indeno(1,2,3-c,d)pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Dibenzo(a,h)anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(g,h,i)perylene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Quinoline	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
IACR CCME (Soil)	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
B[a]P TPE (Soil)	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
EPH C10-C19	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
EPH C19-C32	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
LEPH C10-C19	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
HEPH C19-C32	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
Naphthalene - d8	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
2-Fluorobiphenyl	ORG-180-5102	Modified form BCMOE Lab Manual Section D (PAH)	GC/MS
P-Terphenyl - d14	ORG-180-5102	Modified form BCMOE Lab Manual Section D (PAH)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Benzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Toluene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Ethylbenzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
m&p-Xylene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
o-Xylene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Styrene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
VPH	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
VH	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Bromofluorobenzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Dibromofluoromethane	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Toluene - d8	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
Benzene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
Toluene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
Ethylbenzene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
m&p-Xylene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
o-Xylene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
Styrene	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
VPH	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
VH	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
Bromofluorobenzene	ORG-180-5130	modified from BC MOE Lab Manual Section D	GC/MS
Dibromofluoromethane	ORG-180-5130	modified from BC MOE Lab Manual Section D	GC/MS
Toluene - d8	ORG-180-5130	modified from BC MOE Lab Manual Section D	GC/MS
Benzene - Leachable	ORG-180-5130, ORG-180-5135	BC Lab Manual section D, and EPA 1311	GC/MS/FID
Toluene - Leachable	ORG-180-5130, ORG-180-5135	BC Lab Manual section D, and EPA 1311	GC/MS/FID

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Ethylbenzene - Leachable	ORG-180-5130, ORG-180-5135	BC Lab Manual section D, and EPA 1311	GC/MS/FID
Propylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Monoethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Diethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Triethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Tetraethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Heptanol	TO-1410	EPA SW-846 8015	GC/FID
Diethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Quinoline	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthylene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluorene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Phenanthrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Anthracene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acridine	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Pyrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)anthracene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Chrysene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(b)fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(j)fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(k)fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)pyrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Indeno(1,2,3-c,d)pyrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Dibenzo(a,h)anthracene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(g,h,i)perylene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
1-Methylnaphthalene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
2-Methylnaphthalene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
EPH C10-C19	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
EPH C19-C32	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
LEPH C10-C19	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
HEPH C19-C32	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
Naphthalene - d8			GC/MS
2-Fluorobiphenyl	ORG-180-5133	Modified form BCMOE Lab Manual Section D (PAH)	GC/MS
P-Terphenyl - d14	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Chloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Vinyl Chloride	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromomethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichlorofluoromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Acetone	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dichloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
2-Butanone (MEK)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,2-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,2-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroform	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1-Trichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Carbon Tetrachloride	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Benzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloropropane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromodichloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,3-Dichloropropene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
4-Methyl-2-pentanone (MIBK)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,3-Dichloropropene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS

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SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
1,1,2-Trichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromochloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylene Dibromide	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Tetrachloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1,2-Tetrachloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylbenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
m&p-Xylene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromoform	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Styrene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2,2-Tetrachloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
o-Xylene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,3-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,4-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2,4-Trichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromofluorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromofluoromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene - d8	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
VH	ORG-180-5103	Modified from BC MOE Lab Manual Sec D (VOC)	GC/MS/FID
VPH	ORG-180-5103	Modified from BC MOE Lab Manual Sec D (VOC)	GC/MS/FID
Chloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Vinyl Chloride	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromomethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichlorofluoromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Acetone	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
1,1-Dichloroethene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dichloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
2-Butanone (MEK)	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,2-Dichloroethylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,2-Dichloroethylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroform	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1-Trichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Carbon Tetrachloride	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Benzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloropropane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichloroethene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromodichloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,3-Dichloropropene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
4-Methyl-2-pentanone (MIBK)	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,3-Dichloropropene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2-Trichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromochloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylene Dibromide	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Tetrachloroethene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1,2-Tetrachloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
Chlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylbenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
m&p-Xylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromoform	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Styrene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2,2-Tetrachloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
o-Xylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,3-Dichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,4-Dichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2,4-Trichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromofluorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromofluoromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene - d8	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
VH	ORG-180-5133	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS/FID
VPH	ORG-180-5131	Modified from BC MOE Lab Manual Sec D (VOC)	GC/MS/FID

AGAT Laboratories
Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
AGAT WORK ORDER: 17N243826
PROJECT: 1657709/5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Chloride	INOR-181-6002	Modified from SM 4110 B	ION CHROMATOGRAPH
Aluminum Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Antimony Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Arsenic Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Barium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Beryllium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Bismuth Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Boron Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Cadmium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Calcium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Chromium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Cobalt Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Copper Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Iron Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Lead Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Lithium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Magnesium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Manganese Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Mercury Dissolved	MET-181-6103, LAB-181-4015	Modified from EPA 245.7	CV/AA
Molybdenum Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Nickel Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Potassium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Selenium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Silicon Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Silver Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Sodium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Strontium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Sulphur Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N243826

PROJECT: 1657709/5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Thallium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Tin Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Titanium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Uranium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Vanadium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Zinc Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Zirconium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03839 page 1 of 5

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709/5000
Short Title: K19 Field Invt
Golder Contact: Erin O'Brien
Golder E-mail Address 1: erin_o'brien @golder.com
Golder E-mail Address 2: linda_kemp @golder.com
Laboratory Name: AGAT
Address: 120-8600 Glenlyon Parkway, Burnaby BC
Telephone/Fax: 778-452-4000
Contact: Maggie Chan

Office Name: Vancouver
EQuIS Facility Code: 28433859
EQuIS upload: ☒
WO: 17N243826 Jul 29 AM 10:19

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Regular (5 Days)
Criteria: ☒ CSR ☐ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail
Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Metals	LEPH/HEPH/PAH	BTEX/VPH	VOC	Na + Cl	Soil particle size					RUSH (Select TAT above)	lab ID Remarks (over)
03839 - 01	K19-HA17-30	3	3.5-3.9	Soil	25/07/17	14:50	Discrete			5		X	X	X								8601360
- 02		4	5.0-5.5			16:10				3												371
- 03		5	6.5-7.0			16:20				3												375
- 04		6	8.0-8.7			15:40				5		X	X									377
- 05	K19-HA17-31	1	0.3-0.5		26/07/17	09:00				6	X	X			X	X						386
- 06		2	1.8-2.2			9:10				3												392
- 07		3	3.5-4.0			9:20				5		X	X	X								394
- 08		4	5.0-5.5			9:40				3												396
- 09		5	6.4-6.8			10:00		FPA	03837-10	5		X	X									397
- 10		5	6.4-6.8			10:20		FD	03837-09	5		X	X									399
- 11	K19-HA17-32	1	0.3-0.5			11:10				6	X	X			X	X						404
- 12		2	2.0-2.5			11:30				3												411

Sampler's Signature:	Relinquished by: Signature	Company	Date	Time	Received by: Signature	Company
		Golder	28/07/17	8:15		AGAT LABS

Comments:	Method of Shipment:	Waybill No.:	Received for Lab by:	Date	Time
Invoice Dave Ogguthorpe			JC		
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C) 3	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy

V111596

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03846 page 2 of 5

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 165-7709/5000
Short Title: K19 Field Invt.
Golder Contact: Erin O'Brien
Golder E-mail Address 1: erin_o'brien @golder.com
Golder E-mail Address 2: linda_kemp @golder.com
Laboratory Name: AGAT
Address: 120-8600 Glenlyon Pkwy Burnaby BC
Telephone/Fax: 778-452-4000
Contact: Maggie Chan

Office Name: Vancouver
EQuIS Facility Code: 28433859
EQuIS upload: ☒
WO: 17N243826 Jul 29 AM 10:19

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Regular (5 Days)
Criteria: ☒ CSR ☐ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail
Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Metals	LEPH/HEPH/PAH	BTEX/PHC	VOC	Nutrients Suite	Glycols					RUSH (Select TAT above)	Lab ID Remarks (over)
03846 - 01	K19-MW17-32	3	3.5-4.0	Soil	26/07/17	11:50	Discrete			5		X	X	X								8601416
- 02	↓	4	5.0-5.5		26/07/17	12:10				5		X	X									417
- 03	K19-MW17-33	1	0.3-0.5			14:40				6	X				X							418
- 04		2	1.5-2.0			14:50				3												419
- 05		3	3.5-4.0			15:20				5												421
- 06	↓	4	5.0-5.5		↓	16:10				5		X	X	X								422
- 07	K19-MW17-34	1	0.3-0.5		27/07/17	08:50				6	X				X							423
- 08		2	1.5-2.0			09:00				3												424
- 09		3	3.5-4.0			09:10		FOA	03846-10	5		X	X	X								425
- 10		3	3.5-4.0			09:10		FD	03846-09	5		X	X									427
- 11		4	5.0-5.5			09:30				3												430
- 12	↓	5	6.0-6.5	↓	↓	09:50	↓			5		X	X									431

Sampler's Signature:
Relinquished by: Signature
Company: Golder
Date: 28/07/17
Time: 8:15
Received by: Signature
Company: AGAT LABS

Comments: Invoice Dan Osgathorpe
Method of Shipment:
Waybill No.:
Received for Lab by:
Date
Time
Shipped by:
Shipment Condition:
Seal Intact:
Temp (°C): 2
Cooler opened by:
Date
Time

WHITE: Golder Copy YELLOW: Lab Copy

V111600

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03847 page 3 of 5

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709/5000			Laboratory Name: AGAT
Short Title: KM Field Lab	Golder Contact: Erin O'Brien		Address: 120 Glenlyon Parkway Burnaby, BC
Golder E-mail Address 1: erin-o'brien @golder.com	Golder E-mail Address 2: linda-keno @golder.com		Telephone/Fax: 778-452-4000 Contact: Maggie Chan

Office Name: Vancouver

EQuIS Facility Code: 28433859
EQuIS upload: ☐

WO: 17N243826 Jul 29 Am 10:19

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Regular (5 Days)
Criteria: ☒ CSR ☐ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	metals	LEPH/HEPH/PAH	BTEX/VPH	VOC	Na+Cl soil pore tc	Leachate - BTEX				RUSH (Select TAT above)	Remarks (over) / Lab ID
03847-01	KM-MW17-35	1	0.3-0.5	Soil	27/07/17	10:50	Discrete			6											8601433
-02		2	1.0-1.5			11:00		FDA	03847-03	5	X	X	X	X	X						469
-03		2	1.0-1.5			11:00		FD	03847-02	5	X	X	X		X						470
-04		3	1.8-2.2			11:10				5											471
-05		4	2.5-3.0			11:20				5		X	X								472
-06		5	3.5-4.0			11:30				5											473
-07		MW-6	4.0-4.5			11:40		FDA	03847-08	5		X	X	X		X					474
-08		6	4.0-4.5			11:40		FD	03847-07	5		X	X	X							475
-09		7	5.0-5.5			12:00				5											476
-10		8	6.5-7.0			12:20				5		X	X								477
-11		9	7.5-8.1			12:30				5											478
-12																					~~474~~ 479

Sampler's Signature:	Relinquished by: Signature	Company: Golder	Date: 28/07/17	Time: 8:15	Received by: Signature	Company: AGAT LABS	
Comments: Invoice Dave Osgathorpe	Method of Shipment:	Waybill No.:	Received for Lab by: JL	Date	Time		
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C): 3	Cooler opened by:	Date	Time	

WHITE: Golder Copy YELLOW: Lab Copy

V111599

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03797 page 1 of 5

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709 13000			Laboratory Name: AGAT
Short Title: K19 Alaska Highway	Golder Contact: Erin O'brien		Address: 130-8600 Glenlyon Parkway, Burnaby, BC
Golder E-mail Address 1: erin_o'brien @golder.com	Golder E-mail Address 2: linda_king @golder.com	Telephone/Fax: 778-452-4000	Contact: Maggie Chan

Office Name: Vancouver

EQuIS Facility Code: 2843 3857
EQuIS upload: ☐

WO: 17N243826

JUL 29 AM 10:19

Analyses Required

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Regular (5 Days)
Criteria: ☒ CSR ☒ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	BTEX / VPH	PAH / LEPH / HEPH	Chloride	VOCs	Glycols	F2-F4	Dissolved metals			RUSH (Select TAT above)	Remarks (over)
03797 - 01	K19B-10MW-15	-	-	WG	26/07/17	10:10	GRAB	-	-	10	X	X	X	X			X				*hold F2-F4
03797 - 02	K19-MW17-17	-				11:31		-	-	8	X	X	X	X			X				
03797 - 03	K19-MW17-18	-				12:01		-	-	8	X	X	X	X			X				
03797 - 04	K19-MW17-24	-				14:19		FDA	03797-05	10	X	X	X	X			X				*disregard crossouts, analyze 03797-04 for BTEX/VPH and
03797 - 05	K19-MW17-24	-				14:19		FD	03797-04	10	X	X	X	X			X				
03797 - 06	K19-MW17-25	-				15:40		-	-	11	X	X	X	X	X		X				
03797 - 07	K19-MW16-07S	-		WG	26/07/17	16:41	GRAB	-	-	8	X	X	X				X				LEPH/HEPH/PAH
- 08																					
- 09																					
- 10																					
- 11																					
- 12																					

Sampler's Signature:	Relinquished by: Signature	Company: Golder	Date: 28/07/17	Time: 2:15	Received by: Signature	Company: AGAT LABS
Comments: Invoice Pave Osgthorpe	Method of Shipment:	Waybill No.:	Received for Lab by: SNOR		Date	Time
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C): 3	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy

V111601

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03798 page 1 of 15

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657109/5000			Laboratory Name: AGAT
Short Title: K19 Alaska Highway	Golder Contact:		Address: 120-8600 Glenlyon Parkway, Burnaby BC
Golder E-mail Address 1: erin_o'brien @golder.com	Golder E-mail Address 2: linda_kemp @golder.com	Telephone/Fax: 778-452-4000	Contact: Maggie Chan

Office Name: Vancouver

EQuIS Facility Code: 2843 3859
EQuIS upload: ☐

WO: 17N2436826

JUL 29 AM 10:19

Analyses Required

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Regular (5 Days)
Criteria: ☒ CSR ☒ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	BTEX / VPH	LEPH / HEPH / PAH	Chloride	VOCs	Glycols	F2-F4	Dissolved metals			RUSH (Select TAT above)	Remarks (over)
03798 - 01	K19-MW17-05	-	-	WG	27/07/17	09:10	GRAB	-	-	10	X	X	X	X			X				Hold F2-F4
- 02	K19-MW17-27	-				12:10		-	-	10	X	X	X	X			X				
- 03	K19-MW17-28	-				15:28		-	-	10	X	X	X	X			X				
- 04	K19-MW17-32	-				17:06		FDA	03798-05	8	X	X	X	X			X				
03799 - 05	K19-MW17-32	-	-	WG	27/07/17	17:06	GRAB	FD	03798-04	8	X										X do not analyze 03798-05
- 06																					
- 07																					
- 08																					
- 09																					
- 10																					
- 11																					
- 12																					

Sampler's Signature:	Relinquished by: Signature	Company: Golder	Date: 28/07/17	Time: 0:15	Received by: Signature	Company: GGA LABS
Comments: Invoice Dale Osgthorpe	Method of Shipment:	Waybill No.:	Received for Lab by: SNSD	Date	Time	
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C): 3	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy

V111598

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM – BRANCH RECEIPT

Sending From Branch: EDM☐ GP☐ FN☐ FM☐ RD☐ VAN☐ LYD☐ FSJ☐ EST☐ Other:_____

Company/Consultant: Golder Associates.

TAT: <24hr ☐ 24-48hr ☐ 48-72hr ☐ Reg ☐ Other_____ Cooler Quantity: _____

TIME SENSITIVE ISSUES:

Earliest Date Sampled: _____ ALREADY EXCEEDED? Yes☐ No☐

Microbiology: Test: _____ Expiry: _____

Hydrocarbons: Test: _____ Expiry: _____

Are samples received >5 days after sampling: Yes☐ No☐

(TEMPERATURE MUST BE MAINTAINED IF RECEIVED <10 DEGREES C)

3 temperatures of samples* and average of each cooler (taken on jars only): NA (only bags on coolers)

(1) 2+4+3=3°C (2) 3+1+1=2°C (3) 6+5+4=5°C (4) 5+6+1=5°C

Additional integrity issues (note here and on COC next to the sample ID):

5+2+1=2 (cooler #5).

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM - BURNABY

Work Order # 17N243826

RECEIVING BASICS:

Received From: Norex Waybill #: _____

SAMPLE QUANTITIES:

Coolers: 6 Containers: 277

TIME SENSITIVE ISSUES:

Earliest Date Sampled: 25 July 17 ALREADY EXCEEDED? Yes (No)

NON-CONFORMANCES:

3 temperatures of samples* and average of each cooler: (record differing temperatures on the CoC next to sample ID's) *use jars when available

(1) 4 + 3 + 2 = 3 °C (2) 2 + 2 + 2 = 2 °C (3) 2 + 2 + 2 = 2 °C (4) 4 + 3 + 1 = 3 °C

Was ice or ice pack present: Yes No

Integrity Issues: (5) 5 + 2 + 2 = 3 , (6) 3 + 3 + 2 = 3 (3°C)

Account Project Manager: _____ have they been notified of the above issues: Yes No

Whom spoken to: _____ Date and Time: _____

ADDITIONAL NOTES:

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM

RECEIVING BASICS - Shipping

Company/Consultant: PUBLIC WORKS + GOVT SERV.

Courier: PUROLATOR Prepaid Collect

Waybill# 391 170 282 391 5

Branch: EDM GP FN FM RD (VAN) LYD FSJ EST Other:____

If multiple sites were submitted at once: (Yes) No

Custody Seal Intact: Yes No (NA)

TAT: <24hr (24-48hr) 48-72hr Reg Other_____

Cooler Quantity: 3

TIME SENSITIVE ISSUES - Shipping

ALREADY EXCEEDED HOLD TIME? Yes No

Inorganic Tests (Please Circle): Mibi , BOD , Nitrate/Nitrite , Turbidity , Microtox , Ortho PO4 , Tedlar Bag , Residual Chlorine , Chlorophyll* , Chloroamines*

Earliest Expiry:_____

Hydrocarbons: Earliest Expiry _____

SAMPLE INTEGRITY - Shipping

Hazardous Samples: YES (NO) Precaution Taken:_____

Legal Samples: Yes (No)

International Samples: Yes (No)

Tape Sealed: Yes (No)

Coolant Used: (Icepack) Bagged Ice Free Ice Free Water None

Temperature (Bottles/Jars only) N/A if only Soil Bags Received

FROZEN (Please Circle if samples received Frozen)

1 (Bottle/Jar) 8 + 8 + 7 = 8 °C 2(Bottle/Jar) 8 + 7 + 8 = 8 °C

3 (Bottle/Jar) 8 + 8 + 8 = 8 °C 4 (Bottle/Jar)___+___+___=____ °C

5 (Bottle/Jar)___+___+___=____ °C 6 (Bottle/Jar)___+___+___=____ °C

7 (Bottle/Jar)___+___+___=____ °C 8 (Bottle/Jar)___+___+___=____ °C

9 (Bottle/Jar)___+___+___=____ °C 10 (Bottle/Jar)___+___+___=____ °C

(If more than 10 coolers are received use another sheet of paper and attach)

LOGISTICS USE ONLY

Workorder No: 17N243824

Samples Damaged: Yes No If YES why?

No Bubble Wrap Frozen Courier

Other: _____

Account Project Manager: _____ have they been notified of the above issues: Yes No

Whom spoken to: _____ Date/Time: _____

CPM Initial_____

General Comments: _____

* Subcontracted Analysis (See CPM)

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
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CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
219-800 BURRARD ST
VANCOUVER, BC V6Z 0B9
604-671-1831

ATTENTION TO: Erin O'Brien

PROJECT: 1657709/5000

AGAT WORK ORDER: 17N244304

SOIL ANALYSIS REVIEWED BY: Andrew Garrard, B.Sc., General Manager

TRACE ORGANICS REVIEWED BY: Andrew Garrard, B.Sc., General Manager

WATER ANALYSIS REVIEWED BY: Andrew Garrard, B.Sc., General Manager

DATE REPORTED: Aug 10, 2017

PAGES (INCLUDING COVER): 55

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (778) 452-4000

*NOTES
VERSION 1: Sample receipt temperature 2°C.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

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Certificate of Analysis

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Metals in Soil

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-08

		SAMPLE DESCRIPTION:		03606-01	03606-02
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2017-07-29	2017-07-30
Parameter	Unit	G / S	RDL	8604446	8604447
Aluminum	µg/g		10	13800	17700
Antimony	µg/g		0.1	0.5	0.4
Arsenic	µg/g		0.1	9.4	8.4
Barium	µg/g		0.5	326	731
Beryllium	µg/g		0.1	0.8	0.9
Bismuth	µg/g		0.5	<0.5	<0.5
Cadmium	µg/g		0.01	0.18	0.86
Calcium	µg/g		10	1900	7230
Chromium	µg/g		1	21	23
Cobalt	µg/g		0.1	13.6	8.6
Copper	µg/g		0.2	23.2	20.9
Iron	µg/g		10	25000	28300
Lead	µg/g		0.1	13.0	12.4
Lithium	µg/g		0.5	15.9	32.8
Magnesium	µg/g		10	2980	3690
Manganese	µg/g		1	321	365
Mercury	µg/g		0.01	0.05	0.05
Molybdenum	µg/g		0.2	1.5	1.2
Nickel	µg/g		0.5	23.0	27.8
Phosphorus	µg/g		5	692	1040
Potassium	µg/g		5	1960	2250
Selenium	µg/g		0.1	1.0	1.1
Silver	µg/g		0.5	<0.5	<0.5
Sodium	µg/g		5	90	95
Strontium	µg/g		1	24	45
Thallium	µg/g		0.1	0.2	0.2
Tin	µg/g		0.2	0.6	0.6
Titanium	µg/g		1	100	71
Uranium	µg/g		0.2	1.1	2.4
Vanadium	µg/g		1	42	50

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Metals in Soil

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-08

SAMPLE DESCRIPTION:				03606-01	03606-02
SAMPLE TYPE:				Soil	Soil
DATE SAMPLED:				2017-07-29	2017-07-30
Parameter	Unit	G / S	RDL	8604446	8604447
Zinc	µg/g		1	95	105
Zirconium	µg/g		0.1	0.8	1.0
pH 1:2	pH units		0.05	4.99	6.34

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8604446-8604447 Results are based on the dry weight of the sample

Certified By:

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AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Soil Salinity - Na & Cl

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-08

		SAMPLE DESCRIPTION:		03606-01	03606-02
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2017-07-29	2017-07-30
Parameter	Unit	G / S	RDL	8604446	8604447
Chloride, Soluble	mg/L		2	6	6
Sodium, Soluble	mg/L		2	3	8
Saturation Percentage	%			48.8	65.8
Chloride, Soluble (mg/kg)	mg/kg		2	3	4
Sodium, Soluble (mg/kg)	mg/kg		2	<2	5

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-08

		SAMPLE DESCRIPTION:		03606-01	03606-02	03606-03
		SAMPLE TYPE:		Soil	Soil	Soil
		DATE SAMPLED:		2017-07-29	2017-07-30	2017-07-30
Parameter	Unit	G / S	RDL	8604446	8604447	8604449
Naphthalene	µg/g		0.005	0.009	0.039	0.017
2-Methylnaphthalene	µg/g		0.005	0.011	0.154	0.041
1-Methylnaphthalene	µg/g		0.005	0.010	0.068	0.043
Acenaphthylene	µg/g		0.005	<0.005	<0.005	<0.005
Acenaphthene	µg/g		0.005	<0.005	<0.005	<0.005
Fluorene	µg/g		0.02	<0.02	<0.02	<0.02
Phenanthrene	µg/g		0.02	0.03	0.04	0.06
Anthracene	µg/g		0.004	<0.004	<0.004	<0.004
Fluoranthene	µg/g		0.01	<0.01	0.01	0.02
Pyrene	µg/g		0.01	<0.01	0.01	0.02
Benzo(a)anthracene	µg/g		0.03	<0.03	<0.03	<0.03
Chrysene	µg/g		0.05	<0.05	<0.05	0.05
Benzo(b)fluoranthene	µg/g		0.05	0.05	<0.05	<0.05
Benzo(j)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	<0.03	<0.03	<0.03
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	<0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.005	0.011	0.005	0.009
Benzo(g,h,i)perylene	µg/g		0.05	0.05	<0.05	0.08
Quinoline	µg/g		0.05	<0.05	<0.05	<0.05
IACR CCME (Soil)	µg/g		0.6	0.7	<0.6	0.6
B[a]P TPE (Soil)	µg/g		0.05	<0.05	<0.05	<0.05
EPH C10-C19	µg/g		20	<20	33	<20
EPH C19-C32	µg/g		20	22	129	44
LEPH C10-C19	µg/g		20	<20	33	<20
HEPH C19-C32	µg/g		20	21	128	44
Benzo(b+j)fluoranthene	µg/g		0.05	0.05	<0.05	<0.05

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-08

		SAMPLE DESCRIPTION:	03606-01	03606-02	03606-03
		SAMPLE TYPE:	Soil	Soil	Soil
		DATE SAMPLED:	2017-07-29	2017-07-30	2017-07-30
Surrogate	Unit	Acceptable Limits	8604446	8604447	8604449
Naphthalene - d8	%	50-130	114	78	93
2-Fluorobiphenyl	%	50-130	115	76	93
P-Terphenyl - d14	%	60-130	126	116	116

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8604446-8604449 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
Soil sample is visibly heterogeneous.

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

CCME BTEX/F1-F4 (Water)

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2018-08-08

		SAMPLE DESCRIPTION:		03763-03
		SAMPLE TYPE:		Water
		DATE SAMPLED:		2017-07-29
Parameter	Unit	G / S	RDL	8604454
Benzene	µg/L		0.5	<0.5
Ethylbenzene	µg/L		0.5	<0.5
Toluene	µg/L		0.5	<0.5
m&p-Xylene	µg/L		0.5	<0.5
o-Xylene	µg/L		0.5	<0.5
F1 (C6-C10)	µg/L		100	<100
F1 minus BTEX (C6-C10)	µg/L		100	<100
F2 (C10-C16)	µg/L		100	<100
F3 (C16-C34)	µg/L		100	<100
F4 (C34-C50)	µg/L		100	<100
Total Xylenes	ug/L		1	<1
Surrogate	Unit	Acceptable Limits		
Bromofluorobenzene	%	70-130		85
Dibromofluoromethane	%	70-130		98
Toluene - d8	%	70-130		97

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8604454 The F1 (C6 - C10) fraction is determined by integrating the FID chromatogram from the beginning of the n-C6 peak to the apex of the last n-C10 peak.
The C6 - C10 fraction is calculated from the FID toluene response factor.
Quality control for the calibration follows the guidelines set out in the CCME Contaminated Sites Method for Soils.
The (F1 minus BTEX) has been calculated by subtracting the BTEX concentration from Fraction 1.
The C10 - C16 (F2), C16 - C34 (F3), and C34 - C50 (F4) fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Quality control data is available upon request.
Assistance in the interpretation of data is available upon request.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
The chromatogram has returned to baseline by the retention time of nC50.
Extraction and holding times were met for this sample.

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

CCME F2-F4 (Water)

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03762-01	03762-02	03762-03	03762-04	03762-05	03762-07	03763-01	03763-02
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-28	2017-07-29	2017-07-28	2017-07-28	2017-07-28	2017-07-28	2017-07-29	2017-07-29
Parameter	Unit	G / S	RDL	8604383	8604393	8604416	8604418	8604425	8604432	8604451	8604452
F2 (C10-C16)	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
F4 (C34-C50)	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100

		SAMPLE DESCRIPTION:		03763-05	03763-06
		SAMPLE TYPE:		Water	Water
		DATE SAMPLED:		2017-07-30	2017-07-30
Parameter	Unit	G / S	RDL	8604457	8604470
F2 (C10-C16)	µg/L		100	610	<100
F3 (C16-C34)	µg/L		100	140	<100
F4 (C34-C50)	µg/L		100	<100	<100

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8604383-8604470 The C10 - C16 (F2), C16 - C34 (F3), and C34 - C50 (F4) fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Quality control data is available upon request.
Assistance in the interpretation of data is available upon request.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
The chromatogram has returned to baseline by the retention time of nC50.
Extraction and holding times were met for this sample.

Certified By:

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Glycols Analysis in Water

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03762-01	03762-02	03762-05	03605-01	03763-03
		SAMPLE TYPE:		Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-28	2017-07-29	2017-07-28	2017-07-27	2017-07-29
Parameter	Unit	G / S	RDL	8604383	8604393	8604425	8604435	8604454
Propylene Glycol	mg/L		10	<10	<10	<10	<10	<10
Monoethylene Glycol	mg/L		10	<10	<10	<10	<10	<10
Diethylene Glycol	mg/L		5	<5	<5	<5	<5	<5
Triethylene Glycol	mg/L		10	<10	<10	<10	<10	<10
Tetraethylene Glycol	mg/L		10	<10	<10	<10	<10	<10
Surrogate	Unit	Acceptable Limits						
Heptanol	%	50-150		76	98	89	97	96

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8604383-8604454 Identification based on retention time relative to standards.
Analysis performed at AGAT Calgary.

Certified By:

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Water Low Level

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03762-01	03762-02	03762-03	03762-04	03762-05	03762-06	03762-07	03605-01
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-28	2017-07-29	2017-07-28	2017-07-28	2017-07-28	2017-07-28	2017-07-28	2017-07-27
Parameter	Unit	G / S	RDL	8604383	8604393	8604416	8604418	8604425	8604429	8604432	8604435
Naphthalene	µg/L		0.05	<0.05	0.05	0.15	<0.05	<0.05	<0.05	<0.05	0.16
Quinoline	µg/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Acenaphthene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Fluorene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Phenanthrene	µg/L		0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acridine	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Pyrene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(a)anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(j)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenzo(a,h)anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1-Methylnaphthalene	µg/L		0.05	<0.05	<0.05	0.09	<0.05	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	µg/L		0.05	<0.05	<0.05	0.11	<0.05	<0.05	<0.05	<0.05	<0.05
EPH C10-C19	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
EPH C19-C32	µg/L		100	<100	<100	<100	<100	<100	<100	<100	260
LEPH C10-C19	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
HEPH C19-C32	µg/L		100	<100	<100	<100	<100	<100	<100	<100	260
Benzo(b+j)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Surrogate	Unit	Acceptable Limits									
Naphthalene - d8	%	50-130		80	87	86	85	103	89	89	88
2-Fluorobiphenyl	%	50-130		79	83	81	84	98	86	82	86
P-Terphenyl - d14	%	60-130		80	90	81	62	83	90	76	91

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Certificate of Analysis

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Water Low Level

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-04

Certified By:

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PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Water Low Level

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03763-01	03763-02	03763-03	03763-04	03763-05	03763-06
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-29	2017-07-29	2017-07-29	2017-07-30	2017-07-30	2017-07-30
Parameter	Unit	G / S	RDL	8604451	8604452	8604454	8604456	8604457	8604470
Naphthalene	µg/L		0.05	<0.05	<0.05	<0.05	0.06	23.5	<0.05
Quinoline	µg/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Acenaphthene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Fluorene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	0.21	<0.02
Phenanthrene	µg/L		0.04	<0.04	<0.04	<0.04	<0.04	0.07	<0.04
Anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acridine	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Pyrene	µg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(a)anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(j)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenzo(a,h)anthracene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1-Methylnaphthalene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	11.7	<0.05
2-Methylnaphthalene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05	5.99	0.05
EPH C10-C19	µg/L		100	<100	<100	<100	<100	650	<100
EPH C19-C32	µg/L		100	<100	<100	<100	<100	<100	<100
LEPH C10-C19	µg/L		100	<100	<100	<100	<100	630	<100
HEPH C19-C32	µg/L		100	<100	<100	<100	<100	<100	<100
Benzo(b+j)fluoranthene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Surrogate	Unit	Acceptable Limits		8604451	8604452	8604454	8604456	8604457	8604470
Naphthalene - d8	%	50-130		83	84	91	89	83	91
2-Fluorobiphenyl	%	50-130		82	83	87	85	84	86
P-Terphenyl - d14	%	60-130		86	81	96	85	80	95

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Certificate of Analysis

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Water Low Level

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-04

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8604383-8604470 LEPH & HEPH results have been corrected for PAH contributions.

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CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-08

		SAMPLE DESCRIPTION:		03606-01	03606-02
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2017-07-29	2017-07-30
Parameter	Unit	G / S	RDL	8604446	8604447
Chloromethane	µg/g		0.05	<0.05	<0.05
Vinyl Chloride	µg/g		0.05	<0.05	<0.05
Bromomethane	µg/g		0.05	<0.05	<0.05
Chloroethane	µg/g		0.05	<0.05	<0.05
Trichlorofluoromethane	µg/g		0.05	<0.05	<0.05
Acetone	µg/g		0.5	<0.5	<0.5
1,1-Dichloroethene	µg/g		0.05	<0.05	<0.05
Dichloromethane	µg/g		0.05	<0.05	<0.05
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1	<0.1
2-Butanone (MEK)	µg/g		0.5	<0.5	<0.5
trans-1,2-Dichloroethene	µg/g		0.05	<0.05	<0.05
1,1-Dichloroethane	µg/g		0.05	<0.05	<0.05
cis-1,2-Dichloroethene	µg/g		0.05	<0.05	<0.05
Chloroform	µg/g		0.05	<0.05	<0.05
1,2-Dichloroethane	µg/g		0.05	<0.05	<0.05
1,1,1-Trichloroethane	µg/g		0.05	<0.05	<0.05
Carbon Tetrachloride	µg/g		0.02	<0.02	<0.02
Benzene	µg/g		0.02	<0.02	<0.02
1,2-Dichloropropane	µg/g		0.05	<0.05	<0.05
Trichloroethene	µg/g		0.01	<0.01	<0.01
Bromodichloromethane	µg/g		0.05	<0.05	<0.05
trans-1,3-Dichloropropene	µg/g		0.05	<0.05	<0.05
4-Methyl-2-pentanone (MIBK)	µg/g		0.5	<0.5	<0.5
cis-1,3-Dichloropropene	µg/g		0.05	<0.05	<0.05
1,1,2-Trichloroethane	µg/g		0.05	<0.05	<0.05
Toluene	µg/g		0.05	<0.05	<0.05
Dibromochloromethane	µg/g		0.05	<0.05	<0.05
Ethylene Dibromide	µg/g		0.05	<0.05	<0.05
Tetrachloroethene	µg/g		0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	µg/g		0.05	<0.05	<0.05

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AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-08

		SAMPLE DESCRIPTION:		03606-01	03606-02
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2017-07-29	2017-07-30
Parameter	Unit	G / S	RDL	8604446	8604447
Chlorobenzene	µg/g		0.05	<0.05	<0.05
Ethylbenzene	µg/g		0.05	<0.05	<0.05
m&p-Xylene	µg/g		0.05	<0.05	<0.05
Bromoform	µg/g		0.05	<0.05	<0.05
Styrene	µg/g		0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	µg/g		0.05	<0.05	<0.05
o-Xylene	µg/g		0.05	<0.05	<0.05
1,3-Dichlorobenzene	µg/g		0.05	<0.05	<0.05
1,4-Dichlorobenzene	µg/g		0.05	<0.05	<0.05
1,2-Dichlorobenzene	µg/g		0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	µg/g		0.05	<0.05	<0.05
VH	µg/g		10	<10	<10
VPH	µg/g		10	<10	<10
Total Xylenes	µg/g		0.2	<0.2	<0.2
Surrogate	Unit	Acceptable Limits			
Bromofluorobenzene	%	60-140		93	93
Dibromofluoromethane	%	60-140		103	110
Toluene - d8	%	60-140		112	117

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8604446-8604447 Results are based on dry weight of sample.

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AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Water

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-08

		SAMPLE DESCRIPTION:		03762-01	03762-02	03762-03	03762-04	03762-05	03762-06	03762-07	03605-01
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-28	2017-07-29	2017-07-28	2017-07-28	2017-07-28	2017-07-28	2017-07-28	2017-07-27
Parameter	Unit	G / S	RDL	8604383	8604393	8604416	8604418	8604425	8604429	8604432	8604435
Chloromethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl Chloride	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Bromomethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Acetone	µg/L		10	<10	<10	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Dichloromethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Methyl tert-butyl ether (MTBE)	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
2-Butanone (MEK)	µg/L		10	<10	<10	<10	<10	<10	<10	<10	<10
trans-1,2-Dichloroethylene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethylene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L		1	<1	<1	<1	<1	<1	<1	<1	2
1,2-Dichloroethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Tetrachloride	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
4-Methyl-2-pentanone (MIBK)	µg/L		10	<10	<10	<10	<10	<10	<10	<10	<10
cis-1,3-Dichloropropene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Ethylene Dibromide	µg/L		0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Tetrachloroethene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1

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AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Water

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-08

		SAMPLE DESCRIPTION:		03762-01	03762-02	03762-03	03762-04	03762-05	03762-06	03762-07	03605-01
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-28	2017-07-29	2017-07-28	2017-07-28	2017-07-28	2017-07-28	2017-07-28	2017-07-27
Parameter	Unit	G / S	RDL	8604383	8604393	8604416	8604418	8604425	8604429	8604432	8604435
Chlorobenzene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
m&p-Xylene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
o-Xylene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
VH	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
VPH	µg/L		100	<100	<100	<100	<100	<100	<100	<100	<100
Total Trihalomethanes	µg/L		2	<2	<2	<2	<2	<2	<2	<2	2
Total Xylenes	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Surrogate	Unit	Acceptable Limits									
Bromofluorobenzene	%	70-130		87	81	87	87	82	87	87	89
Dibromofluoromethane	%	70-130		89	88	90	91	89	93	91	90
Toluene - d8	%	70-130		102	96	102	102	96	104	104	104

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Certificate of Analysis

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Water

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-08

SAMPLE DESCRIPTION:				03763-01	03763-02	03763-03	03763-04	03763-05	03763-06
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2017-07-29	2017-07-29	2017-07-29	2017-07-30	2017-07-30	2017-07-30
Parameter	Unit	G / S	RDL	8604451	8604452	8604454	8604456	8604457	8604470
Chloromethane	µg/L		1	<1	<1	<1	<1	<1	<1
Vinyl Chloride	µg/L		1	<1	<1	<1	<1	<1	<1
Bromomethane	µg/L		1	<1	<1	<1	<1	<1	<1
Chloroethane	µg/L		1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	µg/L		1	<1	<1	<1	<1	<1	<1
Acetone	µg/L		10	<10	<10	<10	<10	58	<10
1,1-Dichloroethene	µg/L		1	<1	<1	<1	<1	<1	<1
Dichloromethane	µg/L		1	<1	<1	<1	<1	<1	<1
Methyl tert-butyl ether (MTBE)	µg/L		1	<1	<1	<1	<1	<1	<1
2-Butanone (MEK)	µg/L		10	<10	<10	<10	<10	19	<10
trans-1,2-Dichloroethylene	µg/L		1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L		1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethylene	µg/L		1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L		1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L		1	121	122	<1	<1	2	1
1,1,1-Trichloroethane	µg/L		1	<1	<1	<1	<1	<1	<1
Carbon Tetrachloride	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzene	µg/L		0.5	574	569	<0.5	<0.5	53.8	17.3
1,2-Dichloropropane	µg/L		1	2	2	<1	<1	<1	<1
Trichloroethene	µg/L		1	<1	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L		1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	µg/L		1	<1	<1	<1	<1	<1	<1
4-Methyl-2-pentanone (MIBK)	µg/L		10	<10	<10	<10	<10	<10	<10
cis-1,3-Dichloropropene	µg/L		1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	µg/L		1	<1	<1	<1	<1	<1	<1
Toluene	µg/L		0.5	20.0	20.2	<0.5	<0.5	1.6	<0.5
Dibromochloromethane	µg/L		1	<1	<1	<1	<1	<1	<1
Ethylene Dibromide	µg/L		0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Tetrachloroethene	µg/L		1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	µg/L		1	<1	<1	<1	<1	<1	<1

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Certificate of Analysis

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Water

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-08

		SAMPLE DESCRIPTION:		03763-01	03763-02	03763-03	03763-04	03763-05	03763-06
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-07-29	2017-07-29	2017-07-29	2017-07-30	2017-07-30	2017-07-30
Parameter	Unit	G / S	RDL	8604451	8604452	8604454	8604456	8604457	8604470
Chlorobenzene	µg/L		1	<1	<1	<1	<1	<1	<1
Ethylbenzene	µg/L		0.5	0.5	0.5	<0.5	<0.5	4.3	0.5
m&p-Xylene	µg/L		0.5	0.8	0.9	<0.5	<0.5	6.1	<0.5
Bromoform	µg/L		1	<1	<1	<1	<1	<1	<1
Styrene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	µg/L		1	<1	<1	<1	<1	<1	<1
o-Xylene	µg/L		0.5	0.5	0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	µg/L		1	<1	<1	<1	<1	<1	<1
VH	µg/L		100	640	630	<100	<100	170	<100
VPH	µg/L		100	<100	<100	<100	<100	100	<100
Total Trihalomethanes	µg/L		2	<2	<2	<2	<2	<2	<2
Total Xylenes	µg/L		1	1	1	<1	<1	6	<1
Surrogate	Unit	Acceptable Limits							
Bromofluorobenzene	%	70-130		94	94	87	87	93	86
Dibromofluoromethane	%	70-130		77	77	92	91	82	77
Toluene - d8	%	70-130		96	96	103	101	99	90

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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Certificate of Analysis

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

British Columbia CSR - Schedule 6 Total Metals

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		03763-03
		SAMPLE TYPE:		Water
		DATE SAMPLED:		2017-07-29
Parameter	Unit	G / S	RDL	8604454
Aluminum Total	µg/L		5	1020
Antimony Total	µg/L		0.5	<0.5
Arsenic Total	µg/L		0.1	0.4
Barium Total	µg/L		0.5	89.0
Beryllium Total	µg/L		0.05	0.07
Boron Total	µg/L		5	8
Cadmium Total	µg/L		0.01	0.08
Calcium Total	µg/L		50	4110
Chromium Total	µg/L		0.5	1.0
Cobalt Total	µg/L		0.05	0.64
Copper Total	µg/L		0.5	1.7
Iron Total	µg/L		10	725
Lead Total	µg/L		0.05	0.13
Lithium Total	µg/L		0.5	6.1
Magnesium Total	µg/L		50	1210
Manganese Total	µg/L		1	41
Mercury Total	µg/L		0.01	0.03
Molybdenum Total	µg/L		0.1	<0.1
Nickel Total	µg/L		0.5	5.1
Potassium Total	µg/L		100	358
Selenium Total	µg/L		0.5	<0.5
Silver Total	µg/L		0.02	<0.02
Sodium Total	µg/L		100	1150
Thallium Total	µg/L		0.02	<0.02
Titanium Total	µg/L		1	6
Uranium Total	µg/L		0.01	0.11
Vanadium Total	µg/L		1	1
Zinc Total	µg/L		5	11
Total Hardness (calc)	ug CaCO3/L		100	15200

Certified By:

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AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

British Columbia CSR - Schedule 6 Total Metals

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-04

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:

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AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Chloride

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-03

		SAMPLE DESCRIPTION:		03762-01	03762-02	03762-03	03762-04	03762-05	03762-06			03762-07
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water			Water
		DATE SAMPLED:		2017-07-28	2017-07-29	2017-07-28	2017-07-28	2017-07-28	2017-07-28			2017-07-28
Parameter	Unit	G / S	RDL	8604383	8604393	8604416	8604418	8604425	8604429	RDL		8604432
Chloride	mg/L		0.05	8.82	0.25	0.61	13.7	0.33	0.66	0.5		84.9

		SAMPLE DESCRIPTION:		03605-01	03763-01	03763-02	03763-03	03763-04		03763-05	
		SAMPLE TYPE:		Water	Water	Water	Water	Water		Water	
		DATE SAMPLED:		2017-07-27	2017-07-29	2017-07-29	2017-07-29	2017-07-30		2017-07-30	
Parameter	Unit	G / S	RDL	8604435	8604451	8604452	8604454	8604456	RDL	8604457	
Chloride	mg/L		0.05	6.05	1.84	1.83	<0.05	12.3	0.5	122	

		SAMPLE DESCRIPTION:		03763-06
		SAMPLE TYPE:		Water
		DATE SAMPLED:		2017-07-30
Parameter	Unit	G / S	RDL	8604470
Chloride	mg/L		0.05	3.16

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8604432 Due to matrix interferences sample was diluted for Chloride analysis, detection limits have been adjusted accordingly.

8604457 Due to matrix interferences sample was diluted for Chloride analysis, detection limits have been adjusted accordingly.

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AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-09

		SAMPLE DESCRIPTION:		03762-01		03762-02		03762-03		03762-04
		SAMPLE TYPE:		Water		Water		Water		Water
		DATE SAMPLED:		2017-07-28		2017-07-29		2017-07-28		2017-07-28
Parameter	Unit	G / S	RDL	8604383	RDL	8604393	RDL	8604416	RDL	8604418
Aluminum Dissolved	µg/L		2	4	2	5	2	7	2	5
Antimony Dissolved	µg/L		0.2	<0.2	0.2	0.6	0.2	0.3	0.2	<0.2
Arsenic Dissolved	µg/L		0.1	0.2	0.1	0.3	0.1	0.3	0.1	<0.1
Barium Dissolved	µg/L		0.2	721	1.0	530	2	1220	0.2	92.5
Beryllium Dissolved	µg/L		0.01	0.01	0.01	0.01	0.01	<0.01	0.01	0.01
Bismuth Dissolved	µg/L		0.05	<0.05	0.05	<0.05	0.05	<0.05	0.05	<0.05
Boron Dissolved	µg/L		2	187	2	132	2	904	2	258
Cadmium Dissolved	µg/L		0.01	<0.01	0.01	<0.01	0.01	0.01	0.01	<0.01
Calcium Dissolved	µg/L		50	33400	50	51200	50	14500	50	57500
Chromium Dissolved	µg/L		0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5
Cobalt Dissolved	µg/L		0.05	0.21	0.05	0.45	0.05	0.26	0.05	0.26
Copper Dissolved	µg/L		0.2	<0.2	0.2	<0.2	0.2	0.2	0.2	<0.2
Iron Dissolved	µg/L		10	1320	10	225	10	<10	10	745
Lead Dissolved	µg/L		0.05	<0.05	0.05	<0.05	0.05	0.20	0.05	<0.05
Lithium Dissolved	µg/L		0.5	83.0	0.5	99.2	5	428	2.5	109
Magnesium Dissolved	µg/L		50	17500	50	17700	50	5790	50	24000
Manganese Dissolved	µg/L		1	268	1	364	1	48	1	782
Mercury Dissolved	µg/L		0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01
Molybdenum Dissolved	µg/L		0.05	0.23	0.05	3.52	0.05	2.08	0.05	0.29
Nickel Dissolved	µg/L		0.2	0.3	0.2	1.2	0.2	1.0	0.2	0.4
Potassium Dissolved	µg/L		50	2380	50	3090	50	2230	50	2220
Selenium Dissolved	µg/L		0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5
Silicon Dissolved	µg/L		50	5010	50	3720	50	2980	50	5890
Silver Dissolved	µg/L		0.02	<0.02	0.02	<0.02	0.02	<0.02	0.02	<0.02
Sodium Dissolved	µg/L		50	28300	50	26200	50	178000	50	12300
Strontium Dissolved	µg/L		0.1	954	0.1	689	0.1	545	0.1	741
Sulphur Dissolved	µg/L		500	838	500	1360	500	1860	500	8150
Thallium Dissolved	µg/L		0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01
Tin Dissolved	µg/L		0.05	0.10	0.05	0.16	0.05	0.31	0.05	0.09
Titanium Dissolved	µg/L		0.5	1.2	0.5	0.9	0.5	1.1	0.5	1.5

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Certificate of Analysis

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-09

		SAMPLE DESCRIPTION:		03762-01		03762-02		03762-03		03762-04
		SAMPLE TYPE:		Water		Water		Water		Water
		DATE SAMPLED:		2017-07-28		2017-07-29		2017-07-28		2017-07-28
Parameter	Unit	G / S	RDL	8604383	RDL	8604393	RDL	8604416	RDL	8604418
Uranium Dissolved	µg/L		0.01	0.25	0.01	1.81	0.01	0.51	0.01	0.24
Vanadium Dissolved	µg/L		0.5	<0.5	0.5	<0.5	0.5	0.5	0.5	<0.5
Zinc Dissolved	µg/L		2	<2	2	<2	2	3	2	3
Zirconium Dissolved	µg/L		0.1	<0.1	0.1	0.1	0.1	0.3	0.1	<0.1
Hardness (calc)	ug CaCO3/L		100	155000	100	201000	100	60100	100	242000

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PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-09

		SAMPLE DESCRIPTION:		03762-05	03762-06		03762-07		03605-01	03763-01	03763-02
		SAMPLE TYPE:		Water	Water		Water		Water	Water	Water
		DATE SAMPLED:		2017-07-28	2017-07-28		2017-07-28		2017-07-27	2017-07-29	2017-07-29
Parameter	Unit	G / S	RDL	8604425	8604429	RDL	8604432	RDL	8604435	8604451	8604452
Aluminum Dissolved	µg/L		2	10	12	2	8	2	10	6	7
Antimony Dissolved	µg/L		0.2	<0.2	<0.2	0.2	<0.2	0.2	<0.2	<0.2	<0.2
Arsenic Dissolved	µg/L		0.1	2.4	4.6	0.1	0.3	0.1	<0.1	0.4	0.6
Barium Dissolved	µg/L		0.2	115	115	0.2	8020	0.2	97.7	998	994
Beryllium Dissolved	µg/L		0.01	0.05	0.02	0.01	0.02	0.01	<0.01	0.01	0.02
Bismuth Dissolved	µg/L		0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05	<0.05
Boron Dissolved	µg/L		2	110	161	2	197	2	25	55	58
Cadmium Dissolved	µg/L		0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01
Calcium Dissolved	µg/L		50	34500	43000	50	93000	50	79000	61100	61900
Chromium Dissolved	µg/L		0.5	5.9	<0.5	0.5	<0.5	0.5	1.0	<0.5	<0.5
Cobalt Dissolved	µg/L		0.05	1.72	0.25	0.05	0.46	0.05	0.07	0.45	0.46
Copper Dissolved	µg/L		0.2	0.2	<0.2	0.2	<0.2	0.2	<0.2	<0.2	<0.2
Iron Dissolved	µg/L		10	1930	4010	10	9590	10	31	24100	24400
Lead Dissolved	µg/L		0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05	<0.05
Lithium Dissolved	µg/L		0.5	75.0	96.0	2.5	93.6	0.5	19.0	42.0	43.7
Magnesium Dissolved	µg/L		50	12700	12900	50	35400	50	19600	18900	18900
Manganese Dissolved	µg/L		1	262	768	1	643	1	28	233	233
Mercury Dissolved	µg/L		0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01
Molybdenum Dissolved	µg/L		0.05	0.36	0.52	0.05	0.16	0.05	0.98	0.43	0.40
Nickel Dissolved	µg/L		0.2	2.5	0.5	0.2	1.3	0.2	1.5	0.7	0.7
Potassium Dissolved	µg/L		50	1580	1240	50	2220	50	788	1480	1460
Selenium Dissolved	µg/L		0.5	<0.5	<0.5	0.5	<0.5	0.5	0.9	<0.5	<0.5
Silicon Dissolved	µg/L		50	5430	4230	50	5770	50	1660	4370	4400
Silver Dissolved	µg/L		0.02	<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.02	<0.02
Sodium Dissolved	µg/L		50	14900	18900	50	25500	50	17600	9300	9180
Strontium Dissolved	µg/L		0.1	228	262	0.1	1050	0.1	457	288	289
Sulphur Dissolved	µg/L		500	4330	4300	500	1880	500	19100	6010	6200
Thallium Dissolved	µg/L		0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01
Tin Dissolved	µg/L		0.05	0.12	0.12	0.05	<0.05	0.05	0.05	0.08	0.08
Titanium Dissolved	µg/L		0.5	1.6	1.3	0.5	2.1	0.5	0.5	2.8	2.9

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-09

		SAMPLE DESCRIPTION:		03762-05	03762-06		03762-07		03605-01	03763-01	03763-02
		SAMPLE TYPE:		Water	Water		Water		Water	Water	Water
		DATE SAMPLED:		2017-07-28	2017-07-28		2017-07-28		2017-07-27	2017-07-29	2017-07-29
Parameter	Unit	G / S	RDL	8604425	8604429	RDL	8604432	RDL	8604435	8604451	8604452
Uranium Dissolved	µg/L		0.01	0.48	0.45	0.01	0.36	0.01	0.75	0.23	0.22
Vanadium Dissolved	µg/L		0.5	<0.5	<0.5	0.5	<0.5	0.5	<0.5	<0.5	<0.5
Zinc Dissolved	µg/L		2	5	2	2	4	2	6	<2	<2
Zirconium Dissolved	µg/L		0.1	<0.1	<0.1	0.1	<0.1	0.1	<0.1	<0.1	<0.1
Hardness (calc)	ug CaCO3/L		100	138000	160000	100	378000	100	278000	230000	232000

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Certificate of Analysis

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-09

		SAMPLE DESCRIPTION:		03763-03		03763-04		03763-05	03763-06
		SAMPLE TYPE:		Water		Water		Water	Water
		DATE SAMPLED:		2017-07-29		2017-07-30		2017-07-30	2017-07-30
Parameter	Unit	G / S	RDL	8604454	RDL	8604456	RDL	8604457	8604470
Aluminum Dissolved	µg/L		2	819	2	6	2	28	79
Antimony Dissolved	µg/L		0.2	<0.2	0.2	0.4	0.2	0.3	<0.2
Arsenic Dissolved	µg/L		0.1	0.3	0.1	0.2	0.1	0.9	0.5
Barium Dissolved	µg/L		0.2	79.9	0.2	85.9	0.2	521	89.3
Beryllium Dissolved	µg/L		0.01	0.06	0.01	<0.01	0.01	0.16	0.15
Bismuth Dissolved	µg/L		0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05
Boron Dissolved	µg/L		2	8	2	246	2	108	28
Cadmium Dissolved	µg/L		0.01	0.09	0.01	<0.01	0.01	0.08	0.03
Calcium Dissolved	µg/L		50	4290	50	91900	50	121000	14300
Chromium Dissolved	µg/L		0.5	0.8	0.5	<0.5	0.5	0.5	<0.5
Cobalt Dissolved	µg/L		0.05	0.64	0.05	1.08	0.05	17.3	3.12
Copper Dissolved	µg/L		0.2	1.8	0.2	1.5	0.2	4.5	2.1
Iron Dissolved	µg/L		10	635	10	383	10	1610	128
Lead Dissolved	µg/L		0.05	0.13	0.05	0.11	0.05	0.06	0.06
Lithium Dissolved	µg/L		0.5	5.9	2.5	118	0.5	52.2	6.9
Magnesium Dissolved	µg/L		50	1150	50	27800	50	53200	3930
Manganese Dissolved	µg/L		1	40	1	673	1	1750	320
Mercury Dissolved	µg/L		0.01	0.03	0.01	<0.01	0.01	<0.01	<0.01
Molybdenum Dissolved	µg/L		0.05	0.07	0.05	0.78	0.05	4.33	0.49
Nickel Dissolved	µg/L		0.2	5.3	0.2	2.2	0.2	19.0	11.4
Potassium Dissolved	µg/L		50	308	50	6000	50	13500	2100
Selenium Dissolved	µg/L		0.5	<0.5	0.5	<0.5	0.5	0.8	<0.5
Silicon Dissolved	µg/L		50	2400	50	6110	50	6060	4300
Silver Dissolved	µg/L		0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.02
Sodium Dissolved	µg/L		50	966	50	21000	50	77500	8990
Strontium Dissolved	µg/L		0.1	17.9	0.1	745	0.1	920	50.2
Sulphur Dissolved	µg/L		500	<500	500	16500	500	11000	5950
Thallium Dissolved	µg/L		0.01	<0.01	0.01	<0.01	0.01	0.03	<0.01
Tin Dissolved	µg/L		0.05	<0.05	0.05	0.17	0.05	0.73	0.46
Titanium Dissolved	µg/L		0.5	2.4	0.5	1.4	0.5	1.9	1.8

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Certificate of Analysis

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Dissolved Metals

DATE RECEIVED: 2017-08-01

DATE REPORTED: 2017-08-09

		SAMPLE DESCRIPTION:		03763-03		03763-04		03763-05	03763-06
		SAMPLE TYPE:		Water		Water		Water	Water
		DATE SAMPLED:		2017-07-29		2017-07-30		2017-07-30	2017-07-30
Parameter	Unit	G / S	RDL	8604454	RDL	8604456	RDL	8604457	8604470
Uranium Dissolved	µg/L		0.01	0.10	0.01	0.18	0.01	9.75	0.16
Vanadium Dissolved	µg/L		0.5	0.6	0.5	<0.5	0.5	1.1	0.9
Zinc Dissolved	µg/L		2	12	2	2	2	14	8
Zirconium Dissolved	µg/L		0.1	1.5	0.1	0.1	0.1	2.1	0.5
Hardness (calc)	ug CaCO3/L		100	15400	100	344000	100	521000	51900

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8604393-8604418 Due to matrix interferences sample was diluted for metals analysis, detection limits have been adjusted accordingly.

8604432 Due to matrix interferences sample was diluted for metals analysis, detection limits have been adjusted accordingly.

8604456 Due to matrix interferences sample was diluted for metals analysis, detection limits have been adjusted accordingly.

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Quality Assurance

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AGAT WORK ORDER: 17N244304
PROJECT: 1657709/5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

Soil Analysis

RPT Date:			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Public Works Metals in Soil															
Aluminum	8607930		27500	28200	2.4%	< 10	99%	70%	130%	99%	90%	110%			
Antimony	8602506		0.3	0.3	NA	< 0.1	111%	70%	130%	107%	90%	110%			
Arsenic	8602506		3.8	4.0	4.5%	< 0.1	130%	70%	130%	102%	90%	110%			
Barium	8602506		62.4	63.7	2.1%	< 0.5	107%	70%	130%	106%	90%	110%			
Beryllium	8602506		0.2	0.2	NA	< 0.1	97%	70%	130%	103%	90%	110%			
Bismuth	8602506		<0.5	<0.5	NA	< 0.5				97%	85%	115%			
Cadmium	8602506		0.20	0.21	3.5%	< 0.01	110%	70%	130%	104%	90%	110%			
Calcium	8607930		4650	4580	1.5%	< 10	108%	70%	130%	100%	90%	110%			
Chromium	8602506		13	14	7.2%	< 1	112%	70%	130%	95%	90%	110%			
Cobalt	8602506		5.7	5.8	2.8%	< 0.1	118%	70%	130%	99%	90%	110%			
Copper	8602506		17.2	17.0	1.1%	< 0.2	114%	70%	130%	101%	90%	110%			
Iron	8607930		26400	26600	0.8%	< 10	105%	70%	130%	102%	90%	110%			
Lead	8602506		16.7	16.4	1.8%	< 0.1	98%	70%	130%	103%	90%	110%			
Lithium	8602506		5.5	5.4	1.7%	< 0.5				98%	85%	115%			
Magnesium	8607930		5520	5430	1.6%	< 10	109%	70%	130%	101%	90%	110%			
Manganese	8602506		368	361	1.9%	< 1	123%	70%	130%	101%	90%	110%			
Mercury	8602506		0.04	0.02	NA	< 0.01	88%	70%	130%	97%	90%	110%			
Molybdenum	8602506		0.5	0.5	NA	< 0.2	105%	70%	130%	104%	90%	110%			
Nickel	8602506		10.9	11.1	1.9%	< 0.5	118%	70%	130%	102%	90%	110%			
Phosphorus	8607930		666	724	8.4%	< 5	109%	70%	130%	108%	90%	110%			
Potassium	8607930		701	740	5.3%	< 5	104%	70%	130%	101%	90%	110%			
Selenium	8602506		0.3	0.2	NA	< 0.1				108%	90%	110%			
Silver	8602506		<0.5	<0.5	NA	< 0.5	119%	70%	130%	102%	90%	110%			
Sodium	8607930		217	230	6.0%	< 5	125%	70%	130%	101%	90%	110%			
Strontium	8602506		30	32	6.5%	< 1	107%	70%	130%	90%	90%	110%			
Thallium	8602506		<0.1	<0.1	NA	< 0.1	107%	70%	130%	96%	90%	110%			
Tin	8602506		0.7	0.6	NA	< 0.2	103%	70%	130%	96%	90%	110%			
Titanium	8607930		1300	1320	1.3%	< 1	101%	70%	130%	100%	90%	110%			
Uranium	8602506		0.4	0.4	NA	< 0.2	114%	70%	130%	108%	90%	110%			
Vanadium	8602506		44	43	1.5%	< 1	115%	70%	130%	96%	90%	110%			
Zinc	8602506		46	46	0.0%	< 1	124%	70%	130%	105%	90%	110%			
Zirconium	8602506		1.1	1.0	9.5%	< 0.1	98%	70%	130%	100%	90%	110%			
pH 1:2	8607930		6.65	6.63	0.3%		98%	90%	110%	100%	95%	105%			

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Soil Salinity - Na & Cl															
Chloride, Soluble	8613054		277	258	7.1%	< 2	103%	80%	120%	97%	85%	115%			
Sodium, Soluble			306	285	7.1%	< 2	102%	80%	120%	101%	85%	115%			
Saturation Percentage			36.5	37.0	1.4%	<	91%	80%	120%						

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Soil Analysis (Continued)

RPT Date:			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

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PROJECT: 1657709/5000
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Trace Organics Analysis

RPT Date:			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Public Works LEPH/HEPH in Water Low Level															
Naphthalene	67643	W-MS1	0.48	0.49	2.1%	< 0.05	98%	80%	120%				100%	50%	130%
Quinoline	67643	W-MS1	0.5	0.5	0.0%	< 0.1	101%	80%	120%				106%	50%	130%
Acenaphthylene	67643	W-MS1	0.42	0.43	2.4%	< 0.02	101%	80%	120%				86%	50%	130%
Acenaphthene	67643	W-MS1	0.47	0.47	0.0%	< 0.02	102%	80%	120%				96%	50%	130%
Fluorene	67643	W-MS1	0.45	0.45	0.0%	< 0.02	101%	80%	120%				91%	50%	130%
Phenanthrene	67643	W-MS1	0.38	0.40	5.1%	< 0.04	103%	80%	120%				79%	60%	130%
Anthracene	67643	W-MS1	0.51	0.49	4.0%	< 0.01	100%	80%	120%				103%	60%	130%
Acridine	67643	W-MS1	0.60	0.65	8.0%	< 0.05	102%	80%	120%				121%	50%	130%
Fluoranthene	67643	W-MS1	0.48	0.48	0.0%	< 0.02	101%	80%	120%				97%	60%	130%
Pyrene	67643	W-MS1	0.44	0.54	20.4%	< 0.02	101%	80%	120%				88%	60%	130%
Benzo(a)anthracene	67643	W-MS1	0.43	0.43	0.0%	< 0.01	102%	80%	120%				87%	60%	130%
Chrysene	67643	W-MS1	0.53	0.52	1.9%	< 0.01	102%	80%	120%				108%	60%	130%
Benzo(b)fluoranthene	67643	W-MS1	0.37	0.39	5.3%	< 0.01	102%	80%	120%				75%	60%	130%
Benzo(j)fluoranthene	67643	W-MS1	0.56	0.45	21.8%	< 0.01	100%	80%	120%				112%	60%	130%
Benzo(k)fluoranthene	67643	W-MS1	0.43	0.43	0.0%	< 0.01	104%	80%	120%				87%	60%	130%
Benzo(a)pyrene	67643	W-MS1	0.45	0.50	10.5%	< 0.01	102%	80%	120%				91%	60%	130%
Indeno(1,2,3-c,d)pyrene	67643	W-MS1	0.47	0.45	4.3%	< 0.01	102%	80%	120%				96%	60%	130%
Dibenzo(a,h)anthracene	67643	W-MS1	0.44	0.42	4.7%	< 0.01	102%	80%	120%				90%	60%	130%
Benzo(g,h,i)perylene	67643	W-MS1	0.53	0.50	5.8%	< 0.01	102%	80%	120%				106%	60%	130%
1-Methylnaphthalene	67643	W-MS1	0.45	0.45	0.0%	< 0.05	102%	80%	120%				91%	50%	130%
2-Methylnaphthalene	67643	W-MS1	0.40	0.41	2.5%	< 0.05	102%	80%	120%				81%	50%	130%
EPH C10-C19	67643	W-MS1	9130	9430	3.2%	< 100	104%	70%	130%				87%	70%	130%
EPH C19-C32	67643	W-MS1	15300	15800	3.2%	< 100	99%	70%	130%				90%	70%	130%
Naphthalene - d8	67643	W-MS1	88	86	2.3%		97%	80%	120%				88%	50%	130%
2-Fluorobiphenyl	67643	W-MS1	85	84	1.2%		102%	80%	120%				86%	50%	130%
P-Terphenyl - d14	67643	W-MS1	85	86	1.2%		101%	80%	120%				85%	60%	130%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

CCME F2-F4 (Water)															
F2 (C10-C16)	67643	W-MS1	6140	6350	3.4%	< 100	101%	80%	120%				85%	70%	130%
F3 (C16-C34)	67643	W-MS1	20600	21300	3.3%	< 100	108%	80%	120%				91%	70%	130%
F4 (C34-C50)	67643	W-MS1	4360	4620	5.8%	< 100	100%	80%	120%				82%	70%	130%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

CCME BTEX/F1-F4 (Water)															
Benzene	67662	8619501	<0.5	<0.5	NA	< 0.5	98%	80%	120%				95%	70%	130%
Ethylbenzene	67662	8619501	<0.5	<0.5	NA	< 0.5	97%	80%	120%				94%	70%	130%
Toluene	67662	8619501	<0.5	<0.5	NA	< 0.5	107%	80%	120%				93%	70%	130%
m&p-Xylene	67662	8619501	<0.5	<0.5	NA	< 0.5	96%	80%	120%				94%	70%	130%

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PROJECT: 1657709/5000
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SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date:			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
o-Xylene	67662	8619501	<0.5	<0.5	NA	< 0.5	99%	80%	120%				88%	70%	130%
F1 (C6-C10)	67662	8619501	<100	<100	NA	< 100									
F1 minus BTEX (C6-C10)	67662	8619501	<100	<100	NA	< 100									
Bromofluorobenzene	67662	8619501	81	87	7.1%		106%	70%	130%				97%	70%	130%
Dibromofluoromethane	67662	8619501	100	105	4.9%		98%	70%	130%				100%	70%	130%
Toluene - d8	67662	8619501	97	97	0.0%		107%	70%	130%				102%	70%	130%
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
Volatile Organic Compounds in Soil															
Chloromethane	67655	8606147	<0.05	<0.05	NA	< 0.05	99%	80%	120%				91%	60%	140%
Vinyl Chloride	67655	8606147	<0.05	<0.05	NA	< 0.05	99%	80%	120%				85%	60%	140%
Bromomethane	67655	8606147	<0.05	<0.05	NA	< 0.05	95%	80%	120%				109%	60%	140%
Chloroethane	67655	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				92%	60%	140%
Trichlorofluoromethane	67655	8606147	<0.05	<0.05	NA	< 0.05	99%	80%	120%				81%	70%	130%
Acetone	67655	8606147	<0.5	<0.5	NA	< 0.5	99%	80%	120%				102%	70%	130%
1,1-Dichloroethene	67655	8606147	<0.05	<0.05	NA	< 0.05	99%	80%	120%				98%	70%	130%
Dichloromethane	67655	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				104%	70%	130%
Methyl tert-butyl ether (MTBE)	67655	8606147	<0.1	<0.1	NA	< 0.1	100%	80%	120%				101%	70%	130%
2-Butanone (MEK)	67655	8606147	<0.5	<0.5	NA	< 0.5	99%	80%	120%				104%	70%	130%
trans-1,2-Dichloroethene	67655	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				101%	70%	130%
1,1-Dichloroethane	67655	8606147	<0.05	<0.05	NA	< 0.05	99%	80%	120%				102%	70%	130%
cis-1,2-Dichloroethene	67655	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				101%	70%	130%
Chloroform	67655	8606147	<0.05	<0.05	NA	< 0.05	99%	80%	120%				103%	70%	130%
1,2-Dichloroethane	67655	8606147	<0.05	<0.05	NA	< 0.05	99%	80%	120%				104%	70%	130%
1,1,1-Trichloroethane	67655	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				97%	70%	130%
Carbon Tetrachloride	67655	8606147	<0.02	<0.02	NA	< 0.02	100%	80%	120%				93%	70%	130%
Benzene	67655	8606147	<0.02	<0.02	NA	< 0.02	100%	80%	120%				103%	70%	130%
1,2-Dichloropropane	67655	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				102%	70%	130%
Trichloroethene	67655	8606147	<0.01	<0.01	NA	< 0.01	100%	80%	120%				100%	70%	130%
Bromodichloromethane	67655	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				101%	70%	130%
trans-1,3-Dichloropropene	67655	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				96%	60%	140%
4-Methyl-2-pentanone (MIBK)	67655	8606147	<0.5	<0.5	NA	< 0.5	100%	80%	120%				99%	70%	130%
cis-1,3-Dichloropropene	67655	8606147	<0.05	<0.05	NA	< 0.05	101%	80%	120%				95%	60%	140%
1,1,2-Trichloroethane	67655	8606147	<0.05	<0.05	NA	< 0.05	99%	80%	120%				104%	70%	130%
Toluene	67655	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				101%	70%	130%
Dibromochloromethane	67655	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				101%	70%	130%
Ethylene Dibromide	67655	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				104%	70%	130%
Tetrachloroethene	67655	8606147	<0.05	<0.05	NA	< 0.05	99%	80%	120%				103%	70%	130%
1,1,1,2-Tetrachloroethane	67655	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				101%	70%	130%
Chlorobenzene	67655	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				99%	70%	130%

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
AGAT WORK ORDER: 17N244304
PROJECT: 1657709/5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date:			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Ethylbenzene	67655	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				97%	70%	130%
m&p-Xylene	67655	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				97%	70%	130%
Bromoform	67655	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				97%	70%	130%
Styrene	67655	8606147	<0.05	<0.05	NA	< 0.05	101%	80%	120%				95%	70%	130%
1,1,2,2-Tetrachloroethane	67655	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				99%	70%	130%
o-Xylene	67655	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				99%	70%	130%
1,3-Dichlorobenzene	67655	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				99%	70%	130%
1,4-Dichlorobenzene	67655	8606147	<0.05	<0.05	NA	< 0.05	99%	80%	120%				99%	70%	130%
1,2-Dichlorobenzene	67655	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				99%	70%	130%
1,2,4-Trichlorobenzene	67655	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				96%	70%	130%
Bromofluorobenzene	67655	8606147	112	114	1.8%		107%	60%	140%				104%	60%	140%
Dibromofluoromethane	67655	8606147	126	128	1.6%		96%	60%	140%				97%	60%	140%
Toluene - d8	67655	8606147	131	127	3.1%		98%	60%	140%				106%	60%	140%
VH	67655	8606147	<10	<10	NA	< 10									
VPH	67655	8606147	<10	<10	NA	< 10									

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Public Works LEPH/HEPH in Soil Low Level															
Naphthalene	67644	8606147	<0.005	<0.005	NA	< 0.005	102%	80%	120%				93%	50%	130%
2-Methylnaphthalene	67644	8606147	<0.005	<0.005	NA	< 0.005	102%	80%	120%				103%	50%	130%
1-Methylnaphthalene	67644	8606147	<0.005	<0.005	NA	< 0.005	102%	80%	120%				100%	50%	130%
Acenaphthylene	67644	8606147	<0.005	<0.005	NA	< 0.005	102%	80%	120%				86%	50%	130%
Acenaphthene	67644	8606147	<0.005	<0.005	NA	< 0.005	105%	80%	120%				91%	50%	130%
Fluorene	67644	8606147	<0.02	<0.02	NA	< 0.02	102%	80%	120%				118%	50%	130%
Phenanthrene	67644	8606147	<0.02	<0.02	NA	< 0.02	101%	80%	120%				100%	60%	130%
Anthracene	67644	8606147	<0.004	0.004	NA	< 0.004	101%	80%	120%				117%	60%	130%
Fluoranthene	67644	8606147	<0.01	0.02	NA	< 0.01	101%	80%	120%				120%	60%	130%
Pyrene	67644	8606147	<0.01	0.02	NA	< 0.01	103%	80%	120%				112%	60%	130%
Benzo(a)anthracene	67644	8606147	<0.03	<0.03	NA	< 0.03	100%	80%	120%				117%	60%	130%
Chrysene	67644	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				117%	60%	130%
Benzo(b)fluoranthene	67644	8606147	<0.05	<0.05	NA	< 0.05	100%	80%	120%				120%	60%	130%
Benzo(j)fluoranthene	67644	8606147	<0.05	<0.05	NA	< 0.05	107%	80%	120%				111%	60%	130%
Benzo(k)fluoranthene	67644	8606147	<0.05	<0.05	NA	< 0.05	104%	80%	120%				112%	60%	130%
Benzo(a)pyrene	67644	8606147	<0.03	<0.03	NA	< 0.03	99%	80%	120%				110%	60%	130%
Indeno(1,2,3-c,d)pyrene	67644	8606147	<0.02	<0.02	NA	< 0.02	102%	80%	120%				113%	60%	130%
Dibenzo(a,h)anthracene	67644	8606147	<0.005	<0.005	NA	< 0.005	102%	80%	120%				118%	60%	130%
Benzo(g,h,i)perylene	67644	8606147	<0.05	<0.05	NA	< 0.05	102%	80%	120%				102%	60%	130%
Quinoline	67644	8606147	<0.05	<0.05	NA	< 0.05	102%	80%	120%				128%	50%	130%
IACR CCME (Soil)	67644	8606147	<0.6	<0.6	NA	< 0.6									
B[a]P TPE (Soil)	67644	8606147	<0.05	<0.05	NA	< 0.05									

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Quality Assurance

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AGAT WORK ORDER: 17N244304
PROJECT: 1657709/5000
ATTENTION TO: Erin O'Brien
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Trace Organics Analysis (Continued)

RPT Date:			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
EPH C10-C19	67644	8606147	<20	<20	NA	< 20	104%	70%	130%				104%	65%	120%
EPH C19-C32	67644	8606147	53	70	NA	< 20	103%	70%	130%				103%	80%	120%
Naphthalene - d8	67644	8606147	74	88	17.3%	<	100%	80%	120%				103%	50%	130%
2-Fluorobiphenyl	67644	8606147	78	93	17.5%	<	101%	80%	120%				108%	50%	130%
P-Terphenyl - d14	67644	8606147	76	105	32.0%	<	101%	80%	120%				117%	60%	130%
Glycols Analysis in Water															
Propylene Glycol	112	8604393	<10	<10	NA	< 10	116%	70%	130%	122%	70%	130%	117%	60%	140%
Monoethylene Glycol	112	8604393	<10	<10	NA	< 10	111%	70%	130%	114%	70%	130%	106%	60%	140%
Diethylene Glycol	112	8604393	<5	<5	NA	< 5	113%	70%	130%	114%	70%	130%	106%	60%	140%
Triethylene Glycol	112	8604393	<10	<10	NA	< 10	110%	70%	130%	106%	70%	130%	99%	60%	140%
Tetraethylene Glycol	112	8604393	<10	<10	NA	< 10	107%	70%	130%	92%	70%	130%	82%	60%	140%
Volatile Organic Compounds in Water															
Chloromethane	67662	8604383	<1	<1	NA	< 1	99%	80%	120%				94%	70%	130%
Vinyl Chloride	67662	8604383	<1	<1	NA	< 1	99%	80%	120%				94%	70%	130%
Bromomethane	67662	8604383	<1	<1	NA	< 1	95%	80%	120%				86%	70%	130%
Chloroethane	67662	8604383	<1	<1	NA	< 1	100%	80%	120%				104%	70%	130%
Trichlorofluoromethane	67662	8604383	<1	<1	NA	< 1	99%	80%	120%				95%	70%	130%
Acetone	67662	8604383	<10	<10	NA	< 10	99%	80%	120%						
1,1-Dichloroethene	67662	8604383	<1	<1	NA	< 1	99%	80%	120%				101%	70%	130%
Dichloromethane	67662	8604383	<1	<1	NA	< 1	100%	80%	120%				100%	70%	130%
Methyl tert-butyl ether (MTBE)	67662	8604383	<1	<1	NA	< 1	100%	80%	120%				103%	70%	130%
2-Butanone (MEK)	67662	8604383	<10	<10	NA	< 10	99%	80%	120%						
trans-1,2-Dichloroethylene	67662	8604383	<1	<1	NA	< 1	100%	80%	120%				103%	70%	130%
1,1-Dichloroethane	67662	8604383	<1	<1	NA	< 1	99%	80%	120%				102%	70%	130%
cis-1,2-Dichloroethylene	67662	8604383	<1	<1	NA	< 1	100%	80%	120%				103%	70%	130%
Chloroform	67662	8604383	<1	<1	NA	< 1	99%	80%	120%				101%	70%	130%
1,2-Dichloroethane	67662	8604383	<1	<1	NA	< 1	99%	80%	120%				102%	70%	130%
1,1,1-Trichloroethane	67662	8604383	<1	<1	NA	< 1	100%	80%	120%				106%	70%	130%
Carbon Tetrachloride	67662	8604383	<0.5	<0.5	NA	< 0.5	100%	80%	120%				104%	70%	130%
Benzene	67662	8604383	<0.5	<0.5	NA	< 0.5	100%	80%	120%				103%	70%	130%
1,2-Dichloropropane	67662	8604383	<1	<1	NA	< 1	100%	80%	120%				102%	70%	130%
Trichloroethene	67662	8604383	<1	<1	NA	< 1	100%	80%	120%				101%	70%	130%
Bromodichloromethane	67662	8604383	<1	<1	NA	< 1	100%	80%	120%				100%	70%	130%
trans-1,3-Dichloropropene	67662	8604383	<1	<1	NA	< 1	100%	80%	120%				104%	70%	130%
4-Methyl-2-pentanone (MIBK)	67662	8604383	<10	<10	NA	< 10	100%	80%	120%						
cis-1,3-Dichloropropene	67662	8604383	<1	<1	NA	< 1	101%	80%	120%				98%	70%	130%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date:			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
1,1,2-Trichloroethane	67662	8604383	<1	<1	NA	< 1	99%	80%	120%				105%	70%	130%
Toluene	67662	8604383	<0.5	<0.5	NA	< 0.5	100%	80%	120%				101%	70%	130%
Dibromochloromethane	67662	8604383	<1	<1	NA	< 1	100%	80%	120%				103%	70%	130%
Ethylene Dibromide	67662	8604383	<0.3	<0.3	NA	< 0.3	100%	80%	120%				105%	70%	130%
Tetrachloroethene	67662	8604383	<1	<1	NA	< 1	99%	80%	120%				101%	70%	130%
1,1,1,2-Tetrachloroethane	67662	8604383	<1	<1	NA	< 1	100%	80%	120%				102%	70%	130%
Chlorobenzene	67662	8604383	<1	<1	NA	< 1	100%	80%	120%				103%	70%	130%
Ethylbenzene	67662	8604383	<0.5	<0.5	NA	< 0.5	100%	80%	120%				104%	70%	130%
m&p-Xylene	67662	8604383	<0.5	<0.5	NA	< 0.5	100%	80%	120%				109%	70%	130%
Bromoform	67662	8604383	<1	<1	NA	< 1	100%	80%	120%				104%	70%	130%
Styrene	67662	8604383	<0.5	<0.5	NA	< 0.5	101%	80%	120%				103%	70%	130%
1,1,2,2-Tetrachloroethane	67662	8604383	<1	<1	NA	< 1	100%	80%	120%				101%	70%	130%
o-Xylene	67662	8604383	<0.5	<0.5	NA	< 0.5	100%	80%	120%				104%	70%	130%
1,3-Dichlorobenzene	67662	8604383	<0.5	<0.5	NA	< 0.5	100%	80%	120%				104%	70%	130%
1,4-Dichlorobenzene	67662	8604383	<0.5	<0.5	NA	< 0.5	99%	80%	120%				103%	70%	130%
1,2-Dichlorobenzene	67662	8604383	<0.5	<0.5	NA	< 0.5	100%	80%	120%				103%	70%	130%
1,2,4-Trichlorobenzene	67662	8604383	<1	<1	NA	< 1	100%	80%	120%				99%	70%	130%
Bromofluorobenzene	67662	8604383	87	87	0.0%		107%	70%	130%				110%	70%	130%
Dibromofluoromethane	67662	8604383	89	91	2.2%		96%	70%	130%				92%	70%	130%
Toluene - d8	67662	8604383	102	101	1.0%		98%	70%	130%				105%	70%	130%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Certified By:

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Quality Assurance

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AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Water Analysis

RPT Date:			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Public Works Dissolved Metals															
Aluminum Dissolved	8606398		327	317	3.0%	< 2	100%	90%	110%	100%	90%	110%			
Antimony Dissolved	8606398		<0.2	<0.2	NA	< 0.2	101%	90%	110%	94%	90%	110%			
Arsenic Dissolved	8606398		0.1	0.2	NA	< 0.1	107%	90%	110%	100%	90%	110%			
Barium Dissolved	8606398		23.4	23.8	1.4%	< 0.2	108%	90%	110%	99%	90%	110%			
Beryllium Dissolved	8606398		0.02	0.01	NA	< 0.01	106%	90%	110%	102%	90%	110%			
Bismuth Dissolved	8606398		<0.05	<0.05	NA	< 0.05				97%	90%	110%			
Boron Dissolved	8606398		<2	<2	NA	< 2	96%	90%	110%	94%	90%	110%			
Cadmium Dissolved	8606398		0.02	0.01	NA	< 0.01	99%	90%	110%	97%	90%	110%			
Calcium Dissolved	8606398		7250	7340	1.2%	< 50	97%	90%	110%	104%	90%	110%			
Chromium Dissolved	8606398		<0.5	<0.5	NA	< 0.5	102%	90%	110%	100%	90%	110%			
Cobalt Dissolved	8606398		0.26	0.28	6.2%	< 0.05	103%	90%	110%	100%	90%	110%			
Copper Dissolved	8606398		0.8	0.9	NA	< 0.2	100%	90%	110%	109%	90%	110%			
Iron Dissolved	8606398		601	597	0.7%	< 10	100%	90%	110%	102%	90%	110%			
Lead Dissolved	8606398		0.11	0.12	NA	< 0.05	94%	90%	110%	90%	90%	110%			
Lithium Dissolved	8606398		<0.5	<0.5	NA	< 0.5				103%	90%	110%			
Magnesium Dissolved	8606398		739	743	0.5%	< 50	101%	90%	110%	100%	90%	110%			
Manganese Dissolved	8606398		68	68	0.1%	< 1	104%	90%	110%	101%	90%	110%			
Mercury Dissolved	8606398		<0.01	<0.01	NA	< 0.01	97%	90%	110%	99%	90%	110%			
Molybdenum Dissolved	8606398		0.14	0.12	NA	< 0.05	105%	90%	110%	104%	90%	110%			
Nickel Dissolved	8606398		0.7	0.7	NA	< 0.2	106%	90%	110%	105%	90%	110%			
Potassium Dissolved	8606398		384	359	6.7%	< 50	94%	90%	110%	98%	90%	110%			
Selenium Dissolved	8606398		<0.5	<0.5	NA	< 0.5	105%	90%	110%	92%	90%	110%			
Silicon Dissolved	8606398		2470	2480	0.2%	< 50				92%	90%	110%			
Silver Dissolved	8606398		<0.02	<0.02	NA	< 0.02				97%	90%	110%			
Sodium Dissolved	8606398		8360	8290	0.8%	< 50	99%	90%	110%	100%	90%	110%			
Strontium Dissolved	8606398		43.3	42.6	1.6%	< 0.1	104%	90%	110%	96%	90%	110%			
Sulphur Dissolved	8606398		2610	2610	0.2%	< 500				104%	90%	110%			
Thallium Dissolved	8606398		0.02	0.02	NA	< 0.01	101%	90%	110%	99%	90%	110%			
Tin Dissolved	8606398		<0.05	<0.05	NA	< 0.05				94%	90%	110%			
Titanium Dissolved	8606398		1.5	1.5	NA	< 0.5				98%	90%	110%			
Uranium Dissolved	8606398		<0.01	<0.01	NA	< 0.01	100%	90%	110%	101%	90%	110%			
Vanadium Dissolved	8606398		1.1	1.2	NA	< 0.5	106%	90%	110%	102%	90%	110%			
Zinc Dissolved	8606398		9	9	NA	< 2	98%	90%	110%	101%	90%	110%			
Zirconium Dissolved	8606398		0.2	0.2	NA	< 0.1		90%	110%	120%	70%	130%			

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Chloride															
Chloride	8604454	8604454	<0.05	<0.05	NA	< 0.05	104%	90%	110%	96%	90%	110%			

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SAMPLED BY:

Water Analysis (Continued)

RPT Date:			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Chloride															
Chloride	8609168		2.51	2.51	0.0%	< 0.05	107%	90%	110%	97%	90%	110%			
British Columbia CSR - Schedule 6 Total Metals															
Aluminum Total	8606398		384	393	2.4%	< 5	89%	85%	115%	104%	90%	110%			
Antimony Total	8606398		<0.5	<0.5	NA	< 0.5	104%	85%	115%	104%	90%	110%			
Arsenic Total	8606398		0.1	0.2	NA	< 0.1	89%	85%	115%	93%	90%	110%			
Barium Total	8606398		22.5	25.1	11.1%	< 0.5	102%	85%	115%	109%	90%	110%			
Beryllium Total	8606398		<0.05	<0.05	NA	< 0.05	106%	85%	115%	102%	90%	110%			
Boron Total	8606398		<5	<5	NA	< 5	91%	85%	115%	107%	90%	110%			
Cadmium Total	8606398		<0.01	0.01	NA	< 0.01	99%	85%	115%	103%	90%	110%			
Calcium Total	8606398		7110	7420	4.3%	< 50	97%	85%	115%	100%	90%	110%			
Chromium Total	8606398		<0.5	<0.5	NA	< 0.5	97%	85%	115%	95%	90%	110%			
Cobalt Total	8606398		0.27	0.27	0.1%	< 0.05	109%	85%	115%	96%	90%	110%			
Copper Total	8606398		0.5	0.5	NA	< 0.5	100%	85%	115%	93%	90%	110%			
Iron Total	8606398		792	829	4.5%	< 10	106%	85%	115%	99%	90%	110%			
Lead Total	8606398		0.16	0.16	NA	< 0.05	101%	85%	115%	98%	90%	110%			
Lithium Total	8606398		<0.5	<0.5	NA	< 0.5				98%	90%	110%			
Magnesium Total	8606398		754	785	4.1%	< 50	105%	85%	115%	101%	90%	110%			
Manganese Total	8606398		67	72	6.5%	< 1	106%	85%	115%	99%	90%	110%			
Mercury Total	8610461		<0.01	<0.01	NA	< 0.01	91%	85%	115%	101%	90%	110%			
Molybdenum Total	8606398		0.1	0.1	NA	< 0.1	99%	85%	115%	106%	90%	110%			
Nickel Total	8606398		<0.5	<0.5	NA	< 0.5	107%	85%	115%	95%	90%	110%			
Potassium Total	8606398		432	428	NA	< 100	101%	85%	115%	103%	90%	110%			
Selenium Total	8606398		<0.5	<0.5	NA	< 0.5	101%	85%	115%	94%	90%	110%			
Silver Total	8606398		<0.02	<0.02	NA	< 0.02				93%	90%	110%			
Sodium Total	8606398		8490	8710	2.6%	< 100	103%	85%	115%	101%	90%	110%			
Thallium Total	8606398		<0.02	<0.02	NA	< 0.02	99%	85%	115%	98%	90%	110%			
Titanium Total	8606398		2	2	NA	< 1				105%	90%	110%			
Uranium Total	8606398		<0.01	<0.01	NA	< 0.01	101%	85%	115%	97%	90%	110%			
Vanadium Total	8606398		1	2	NA	< 1	102%	85%	115%	97%	90%	110%			
Zinc Total	8606398		7	8	NA	< 5	97%	85%	115%	93%	90%	110%			

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date:			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Certified By:

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Method Summary

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SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Aluminum	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Antimony	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Arsenic	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Barium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Beryllium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Bismuth	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Cadmium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Calcium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Chromium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Cobalt	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Copper	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Iron	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Lead	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Lithium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Magnesium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Manganese	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP-MS
Mercury	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Molybdenum	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Nickel	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Phosphorus	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Potassium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Selenium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Silver	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Sodium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Strontium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP-MS
Thallium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Tin	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS

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SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Titanium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Uranium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Vanadium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Zinc	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Zirconium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
pH 1:2	INOR-181-6031	BC MOE Lab Manual B (pH, Electrometric, Soil)	PH METER
Chloride, Soluble	LAB-181-4022, INOR-181-6023	BC MOE Lab Manual Section B	COLORIMETER
Sodium, Soluble	LAB-181-4022, MET-181-6106	BC MOE Lab Manual Section B	ICP/OES
Saturation Percentage	LAB-181-4022	BC MOE Lab Manual Section B	GRAVIMETRIC

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SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Naphthalene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
2-Methylnaphthalene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
1-Methylnaphthalene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthylene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluorene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Phenanthrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Chrysene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(b)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(j)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(k)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Indeno(1,2,3-c,d)pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Dibenzo(a,h)anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(g,h,i)perylene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Quinoline	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
IACR CCME (Soil)	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
B[a]P TPE (Soil)	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
EPH C10-C19	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
EPH C19-C32	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
LEPH C10-C19	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
HEPH C19-C32	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
Naphthalene - d8	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS

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SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
2-Fluorobiphenyl	ORG-180-5102	Modified form BCMOE Lab Manual Section D (PAH)	GC/MS
P-Terphenyl - d14	ORG-180-5102	Modified form BCMOE Lab Manual Section D (PAH)	GC/MS
Benzene	ORG-180-5130	EPA SW-846 8260	GC/MS/FID
Ethylbenzene	ORG-180-5130	EPA SW-846 8260	GC/MS/FID
Toluene	ORG-180-5130	EPA SW-846 8260	GC/MS/FID
m&p-Xylene	ORG-180-5130	EPA SW-846 8260	GC/MS/FID
o-Xylene	ORG-180-5130	EPA SW-846 8260	GC/MS/FID
F1 (C6-C10)	ORG-180-5130	CCME Tier 1 Method	GC/MS/FID
F1 minus BTEX (C6-C10)	ORG-180-5130	CCME Tier 1 Method	GC/MS/FID
F2 (C10-C16)	ORG-180-5134	CCME Tier 1 Method	GC/FID
F3 (C16-C34)	ORG-180-5134	CCME Tier 1 Method	GC/FID
F4 (C34-C50)	ORG-180-5134	CCME Tier 1 Method	GC/FID
Bromofluorobenzene			GC/MS
Dibromofluoromethane			GC/MS
Toluene - d8			GC/MS
Propylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Monoethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Diethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Triethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Tetraethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Heptanol	TO-1410	EPA SW-846 8015	GC/FID
Quinoline	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthylene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluorene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Phenanthrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Anthracene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acridine	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Pyrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)anthracene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Chrysene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(b)fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(j)fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(k)fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)pyrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Indeno(1,2,3-c,d)pyrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Dibenzo(a,h)anthracene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(g,h,i)perylene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
1-Methylnaphthalene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
2-Methylnaphthalene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
EPH C10-C19	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
EPH C19-C32	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
LEPH C10-C19	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
HEPH C19-C32	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
Naphthalene - d8			GC/MS
2-Fluorobiphenyl	ORG-180-5133	Modified form BCMOE Lab Manual Section D (PAH)	GC/MS
P-Terphenyl - d14	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Chloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Vinyl Chloride	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromomethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichlorofluoromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Acetone	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dichloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
2-Butanone (MEK)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,2-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,2-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroform	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1-Trichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS

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SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Carbon Tetrachloride	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Benzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloropropane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromodichloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,3-Dichloropropene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
4-Methyl-2-pentanone (MIBK)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,3-Dichloropropene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2-Trichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromochloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylene Dibromide	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Tetrachloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1,2-Tetrachloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylbenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
m&p-Xylene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromoform	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Styrene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2,2-Tetrachloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
o-Xylene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,3-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,4-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2,4-Trichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromofluorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromofluoromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene - d8	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS

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SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
VH	ORG-180-5103	Modified from BC MOE Lab Manual Sec D (VOC)	GC/MS/FID
VPH	ORG-180-5103	Modified from BC MOE Lab Manual Sec D (VOC)	GC/MS/FID
Chloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Vinyl Chloride	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromomethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichlorofluoromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Acetone	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dichloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
2-Butanone (MEK)	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,2-Dichloroethylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,2-Dichloroethylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroform	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1-Trichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Carbon Tetrachloride	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Benzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloropropane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichloroethene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromodichloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,3-Dichloropropene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
4-Methyl-2-pentanone (MIBK)	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,3-Dichloropropene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2-Trichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Dibromochloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylene Dibromide	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Tetrachloroethene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1,2-Tetrachloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
Chlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylbenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
m&p-Xylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromoform	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Styrene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2,2-Tetrachloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
o-Xylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,3-Dichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,4-Dichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2,4-Trichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromofluorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromofluoromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene - d8	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
VH	ORG-180-5133	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS/FID
VPH	ORG-180-5131	Modified from BC MOE Lab Manual Sec D (VOC)	GC/MS/FID

AGAT Laboratories
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CANADA V5J 0B6
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Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
AGAT WORK ORDER: 17N244304
PROJECT: 1657709/5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Aluminum Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Antimony Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Arsenic Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Barium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Beryllium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Boron Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Cadmium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Calcium Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Chromium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Cobalt Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Copper Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Iron Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Lead Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Lithium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Magnesium Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Manganese Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Mercury Total	MET-181-6103	Modified from EPA 245.7	CV/AA
Molybdenum Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Nickel Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Potassium Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Selenium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Silver Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Sodium Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Thallium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Titanium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Uranium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Vanadium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Zinc Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS

Unit 120, 8600 Glenlyon Parkway
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CANADA V5J 0B6
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FAX (778)452-4074
http://www.agatlabs.com

Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Chloride	INOR-181-6002	Modified from SM 4110 B	ION CHROMATOGRAPH
Aluminum Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Antimony Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Arsenic Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Barium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Beryllium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Bismuth Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Boron Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Cadmium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Calcium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Chromium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Cobalt Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Copper Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Iron Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Lead Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Lithium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Magnesium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Manganese Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Mercury Dissolved	MET-181-6103, LAB-181-4015	Modified from EPA 245.7	CV/AA
Molybdenum Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Nickel Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Potassium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Selenium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Silicon Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Silver Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Sodium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Strontium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Sulphur Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N244304

PROJECT: 1657709/5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Thallium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Tin Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Titanium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Uranium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Vanadium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Zinc Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Zirconium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03762 page 1 of 4

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number:			Laboratory Name:
Short Title:	Golder Contact:		Address:
Golder E-mail Address 1: @golder.com	Golder E-mail Address 2: @golder.com		Telephone/Fax: / Contact:

Office Name:

EQuIS Facility Code:
EQuIS upload: ☐

TN 244354

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☑ Regular (5 Days)
Criteria: ☐ CSR ☑ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	RUSH (Select TAT above)	Remarks (over)
- 01				LIQ			GRAB	-	-	13		8004383
- 02										11		8004393
- 03								-	-	9		8004416
- 04								-	-	10		8004418
- 05								-	-	11		8004425
- 06								-	-	9		8004429
- 07				LIQ			GRAB	-	-	10		8004432
- 08												
- 09												
- 10												
- 11												
- 12												

Sampler's Signature:	Relinquished by: Signature	Company: Golder	Date: 30-JUL-17	Time: 17:50	Received by: Signature	Company: AGAT LABS
Comments: Invoice Dave Osgathorpe	Method of Shipment:	Waybill No.:	Received for Lab by: Adam Peterson	Date: 7/30/17	Time: 5:50 pm	
	Shipped by:	Shipment Condition: / Seal Intact:	Temp (°C)	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy

Copy to Client

V111021

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03605 page 2 of 4

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709/5000		Laboratory Name: AGAT	
Short Title: K19 Field Inv.	Golder Contact: Erin O'Brien	Address: 120-8600 Glenlyon Pkwy Burnaby BC	
Golder E-mail Address 1: erin_o'brien @golder.com	Golder E-mail Address 2: linda_kemp @golder.com	Telephone/Fax: (778) 452-4000	Contact: Maggie Chan

Office Name: Vancouver - Virtual Way

EQuIS Facility Code: 28433059
EQuIS upload: ☑

ITN 244304

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☑ Regular (5 Days)
Criteria: ☑ CSR ☑ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Diss Metals	Diss Hg	BTEX/PHC/VOCs	CCME/PHC/Fpilt	Chloride	Glycols			RUSH (Select TAT above)	Remarks (over)
03605 - 01	Drill Water	1	–	W	27/07/17	1155	–			11	✓	✓	✓	✓	✓	✓		8604435		
- 02																				
- 03																				
- 04																				
- 05																				
- 06																				
- 07																				
- 08																				
- 09																				
- 10																				
- 11																				
- 12																				

Sampler's Signature:	Relinquished by: Signature	Company: Golder	Date: 30-Jul-17	Time: 1750	Received by: Signature	Company: AGAT LABS
Comments: Invoice Dave Ogilvie	Method of Shipment:	Waybill No.:	Received for Lab by: Adam Peterson	Date: 7/30/17	Time: 5:50pm	
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C)	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy

V111025

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03606 page 3 of 4

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709 / 5000		Laboratory Name: AGAT	
Short Title: K19 Field Inv	Golder Contact: Erin O'Brien	Address: 120 8000 Glenlyon Pkwy, Burnaby BC	
Golder E-mail Address 1: erin_obrien@golder.com	Golder E-mail Address 2: linda_kemp@golder.com	Telephone/Fax: (778) 452-4000	Contact: Maggie Chan

Office Name: Vancouver Virtual Way

EQuIS Facility Code: 1843859
EQuIS upload: ☑

17W-4434

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☑ Regular (5 Days)
Criteria: ☑ CSR ☐ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Analyses Required: metals	LEPH/HEPH/PAH	BTEX/VPH	VOC	Soil Particle Size					RUSH (Select TAT above)	Remarks (over)
03606 - 01	K19-HA17-02	1	0.5-0.9	Soil	29/03/17	16:50	Duplicate			5	X	X	X	X	X						
- 02	K19-HA17-08	1	0.3-0.45		30/03/17	12:35				5	X	X	X	X	X		8604446				
- 03		2	0.7-1.1			12:45		FDA	03606-04	5		X					8604447				
- 04		2	0.7-1.1			12:45		FD	03606-03	5							8604449				
- 05																	8604450				
- 06																					
- 07																					
- 08																					
- 09																					
- 10																					
- 11																					
- 12																					

Sampler's Signature:	Relinquished by: Signature	Company: Golder	Date: 30 JUL-17	Time: 17 50	Received by: Signature	Company: AGAT LABS
Comments: Invoice Doc Ogontarpe	Method of Shipment:	Waybill No.:	Received for Lab by: Adam Peterson	Date: 7/30/17	Time: 5:50 pm	
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C)	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy

V111029

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 03763 page 4 of 4

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number:		Laboratory Name:	
Short Title:	Golder Contact:	Address:	
Golder E-mail Address 1: @golder.com	Golder E-mail Address 2: @golder.com	Telephone/Fax:	Contact:

Office Name:

EQuIS Facility Code:
EQuIS upload: ☐

IN244304

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☐ Regular (5 Days)
Criteria: ☐ CSR ☐ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	RUSH (Select TAT above)	Remarks (over)
- 01												8604451
- 02												8604452
- 03												8604454
- 04												
- 05												8604456
- 06												8604457
- 07												8604458
- 08												
- 09												
- 10												
- 11												
- 12												

Sampler's Signature:	Relinquished by: Signature	Company: Golder	Date: 30-Jun-17	Time: 17:40	Received by: Signature	Company: AGAT LABS
Comments: Invoice Dave Osgunthorpe	Method of Shipment:	Waybill No.:	Received for Lab by: Adam Peterson	Date: 7/30/17	Time: 5:50 pm	
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C)	Cooler opened by:	Date	Time

WHITE: Golder Copy YELLOW: Lab Copy

V111022

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM – BRANCH RECEIPT

Sending From Branch: EDM☐ GP☐ FN☐ FM☐ RD☐ VAN☐ LYD☐ FSJ☐ EST☐ Other:_____

Company/Consultant: Golder Associates

TAT: <24hr ☐ 24-48hr ☐ 48-72hr ☐ Reg ☐ Other_____ Cooler Quantity: _____

TIME SENSITIVE ISSUES:

Earliest Date Sampled: _____ ALREADY EXCEEDED? Yes☐ No☐

Microbiology: Test: _____ Expiry: _____

Hydrocarbons: Test: _____ Expiry: _____

Are samples received >5 days after sampling: Yes☐ No☐

(TEMPERATURE MUST BE MAINTAINED IF RECEIVED <10 DEGREES C)

3 temperatures of samples* and average of each cooler (taken on jars only): NA (only bags on coolers)

(1) 4+2+3=3°C (2) 2+4+4=4°C (3) 6+3+5=5°C (4) ___+___+___=___°C

Additional integrity issues (note here and on COC next to the sample ID):

2 coolers recieved with empty samples. Empty. Samples kept in FSJ.

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM - BURNABY

Work Order # 17W2447.4

RECEIVING BASICS:

Received From: NC Vex Waybill #: _____

SAMPLE QUANTITIES:

Coolers: 0 AC Containers: 163.

TIME SENSITIVE ISSUES:

Earliest Date Sampled: July 27, 2017. ALREADY EXCEEDED? Yes (No)

NON-CONFORMANCES:

3 temperatures of samples* and average of each cooler: (record differing temperatures on the CoC next to sample ID's) ***use jars when available**

(1) 0 + 2 + 2 = 2 °C (2) 2 + 2 + 2 = 2 °C (3) 2 + 2 + 2 = 2 °C (4) ___ + ___ + ___ = ___ °C

Was ice or ice pack present: (Yes) No

Integrity Issues:

Account Project Manager: _____ have they been notified of the above issues: Yes No

Whom spoken to: _____ Date and Time: _____

ADDITIONAL NOTES:

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
219-800 BURRARD ST
VANCOUVER, BC V6Z 0B9
604-671-1831

ATTENTION TO: Erin O'Brien

PROJECT: 1657709-5000

AGAT WORK ORDER: 17N271535

SOIL ANALYSIS REVIEWED BY: Andrew Garrard, B.Sc., General Manager

TRACE ORGANICS REVIEWED BY: Andrew Garrard, B.Sc., General Manager

DATE REPORTED: Oct 18, 2017

PAGES (INCLUDING COVER): 22

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (778) 452-4000

*NOTES
VERSION 1: Sample receipt temperature 0°C.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories
Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17N271535

PROJECT: 1657709-5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Metals in Soil

DATE RECEIVED: 2017-10-13

DATE REPORTED: 2017-10-17

		SAMPLE DESCRIPTION:		04263-01	04263-04
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2017-10-11	2017-10-11
Parameter	Unit	G / S	RDL	8814892	8814898
Aluminum	µg/g		10	11200	12700
Antimony	µg/g		0.1	0.3	0.4
Arsenic	µg/g		0.1	6.4	9.5
Barium	µg/g		0.5	366	202
Beryllium	µg/g		0.1	0.6	0.6
Bismuth	µg/g		0.5	<0.5	<0.5
Cadmium	µg/g		0.01	0.51	0.21
Calcium	µg/g		10	2540	1040
Chromium	µg/g		1	19	21
Cobalt	µg/g		0.1	5.9	10.7
Copper	µg/g		0.2	19.0	16.8
Iron	µg/g		10	26900	24500
Lead	µg/g		0.1	27.5	14.6
Lithium	µg/g		0.5	6.1	12.6
Magnesium	µg/g		10	1730	2740
Manganese	µg/g		1	277	348
Mercury	µg/g		0.01	0.04	0.03
Molybdenum	µg/g		0.2	2.3	1.7
Nickel	µg/g		0.5	16.8	18.0
Phosphorus	µg/g		5	920	608
Potassium	µg/g		5	1740	1740
Selenium	µg/g		0.1	0.4	0.7
Silver	µg/g		0.5	0.6	<0.5
Sodium	µg/g		5	39	43
Strontium	µg/g		1	21	20
Thallium	µg/g		0.1	0.2	0.2
Tin	µg/g		0.2	0.6	0.6
Titanium	µg/g		1	30	40
Uranium	µg/g		0.2	0.6	0.6
Vanadium	µg/g		1	47	47

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Certificate of Analysis

AGAT WORK ORDER: 17N271535

PROJECT: 1657709-5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works Metals in Soil

DATE RECEIVED: 2017-10-13

DATE REPORTED: 2017-10-17

SAMPLE DESCRIPTION:				04263-01	04263-04
SAMPLE TYPE:				Soil	Soil
DATE SAMPLED:				2017-10-11	2017-10-11
Parameter	Unit	G / S	RDL	8814892	8814898
Zinc	µg/g		1	73	94
Zirconium	µg/g		0.1	0.4	0.4
pH 1:2	pH units		0.05	4.36	4.45

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8814892-8814898 Results are based on the dry weight of the sample

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Certificate of Analysis

AGAT WORK ORDER: 17N271535

PROJECT: 1657709-5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-10-13

DATE REPORTED: 2017-10-18

		SAMPLE DESCRIPTION:		04263-01	04263-04
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2017-10-11	2017-10-11
Parameter	Unit	G / S	RDL	8814892	8814898
Naphthalene	µg/g		0.005	<0.005	<0.005
2-Methylnaphthalene	µg/g		0.005	<0.005	<0.005
1-Methylnaphthalene	µg/g		0.005	<0.005	<0.005
Acenaphthylene	µg/g		0.005	<0.005	<0.005
Acenaphthene	µg/g		0.005	<0.005	<0.005
Fluorene	µg/g		0.02	<0.02	<0.02
Phenanthrene	µg/g		0.02	<0.02	<0.02
Anthracene	µg/g		0.004	<0.004	<0.004
Fluoranthene	µg/g		0.01	<0.01	<0.01
Pyrene	µg/g		0.01	<0.01	<0.01
Benzo(a)anthracene	µg/g		0.03	<0.03	<0.03
Chrysene	µg/g		0.05	<0.05	<0.05
Benzo(b)fluoranthene	µg/g		0.05	<0.05	<0.05
Benzo(j)fluoranthene	µg/g		0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.03	<0.03	<0.03
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.005	<0.005	<0.005
Benzo(g,h,i)perylene	µg/g		0.05	<0.05	<0.05
Quinoline	µg/g		0.05	<0.05	<0.05
IACR CCME (Soil)	µg/g		0.6	<0.6	<0.6
B[a]P TPE (Soil)	µg/g		0.05	<0.05	<0.05
EPH C10-C19	µg/g		20	56	25
EPH C19-C32	µg/g		20	381	77
LEPH C10-C19	µg/g		20	56	25
HEPH C19-C32	µg/g		20	381	77
Benzo(b+j)fluoranthene	µg/g		0.05	<0.05	<0.05

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Certificate of Analysis

AGAT WORK ORDER: 17N271535

PROJECT: 1657709-5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Public Works LEPH/HEPH in Soil Low Level

DATE RECEIVED: 2017-10-13

DATE REPORTED: 2017-10-18

		SAMPLE DESCRIPTION:	04263-01	04263-04
		SAMPLE TYPE:	Soil	Soil
		DATE SAMPLED:	2017-10-11	2017-10-11
Surrogate	Unit	Acceptable Limits	8814892	8814898
Naphthalene - d8	%	50-130	58	54
2-Fluorobiphenyl	%	50-130	70	66
P-Terphenyl - d14	%	60-130	81	82

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8814892-8814898 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
Soil sample is visibly heterogeneous.

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AGAT WORK ORDER: 17N271535

PROJECT: 1657709-5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

BTEX / VPH (C6-C10) Soil

DATE RECEIVED: 2017-10-13

DATE REPORTED: 2017-10-18

		SAMPLE DESCRIPTION:		04263-01
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2017-10-11
Parameter	Unit	G / S	RDL	8814892
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1
Benzene	µg/g		0.02	<0.02
Toluene	µg/g		0.05	<0.05
Ethylbenzene	µg/g		0.05	<0.05
m&p-Xylene	µg/g		0.05	<0.05
o-Xylene	µg/g		0.05	<0.05
Styrene	µg/g		0.05	<0.05
VPH	µg/g		10	<10
VH	µg/g		10	<10
Total Xylenes	ug/g		0.1	<0.1
Surrogate	Unit	Acceptable Limits		
Bromofluorobenzene	%	60-140		104
Dibromofluoromethane	%	60-140		102
Toluene - d8	%	60-140		118

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8814892 Results are based on dry weight of sample.
VPH results have been corrected for BTEX contributions.

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AGAT WORK ORDER: 17N271535

PROJECT: 1657709-5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Glycols Analysis in Soil

DATE RECEIVED: 2017-10-13

DATE REPORTED: 2017-10-17

		SAMPLE DESCRIPTION:		04263-04
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2017-10-11
Parameter	Unit	G / S	RDL	8814898
Propylene Glycol	mg/kg		10	<10
Monoethylene Glycol	mg/kg		10	<10
Diethylene Glycol	mg/kg		10	<10
Triethylene Glycol	mg/kg		10	<10
Tetraethylene Glycol	mg/kg		10	<10
Surrogate	Unit	Acceptable Limits		
Heptanol	%	50-150		91

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8814898 Analysis by GC/FID.
Results are based on the dry weight of the sample.

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AGAT WORK ORDER: 17N271535

PROJECT: 1657709-5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-10-13

DATE REPORTED: 2017-10-17

		SAMPLE DESCRIPTION:		04263-04
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2017-10-11
Parameter	Unit	G / S	RDL	8814898
Chloromethane	µg/g		0.05	<0.05
Vinyl Chloride	µg/g		0.05	<0.05
Bromomethane	µg/g		0.05	<0.05
Chloroethane	µg/g		0.05	<0.05
Trichlorofluoromethane	µg/g		0.05	<0.05
Acetone	µg/g		0.5	<0.5
1,1-Dichloroethene	µg/g		0.05	<0.05
Dichloromethane	µg/g		0.05	<0.05
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1
2-Butanone (MEK)	µg/g		0.5	<0.5
trans-1,2-Dichloroethene	µg/g		0.05	<0.05
1,1-Dichloroethane	µg/g		0.05	<0.05
cis-1,2-Dichloroethene	µg/g		0.05	<0.05
Chloroform	µg/g		0.05	<0.05
1,2-Dichloroethane	µg/g		0.05	<0.05
1,1,1-Trichloroethane	µg/g		0.05	<0.05
Carbon Tetrachloride	µg/g		0.02	<0.02
Benzene	µg/g		0.02	<0.02
1,2-Dichloropropane	µg/g		0.05	<0.05
Trichloroethene	µg/g		0.01	<0.01
Bromodichloromethane	µg/g		0.05	<0.05
trans-1,3-Dichloropropene	µg/g		0.05	<0.05
4-Methyl-2-pentanone (MIBK)	µg/g		0.5	<0.5
cis-1,3-Dichloropropene	µg/g		0.05	<0.05
1,1,2-Trichloroethane	µg/g		0.05	<0.05
Toluene	µg/g		0.05	<0.05
Dibromochloromethane	µg/g		0.05	<0.05
Ethylene Dibromide	µg/g		0.05	<0.05
Tetrachloroethene	µg/g		0.05	<0.05
1,1,1,2-Tetrachloroethane	µg/g		0.05	<0.05

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Certificate of Analysis

AGAT WORK ORDER: 17N271535

PROJECT: 1657709-5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2017-10-13

DATE REPORTED: 2017-10-17

		SAMPLE DESCRIPTION:		04263-04
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2017-10-11
Parameter	Unit	G / S	RDL	8814898
Chlorobenzene	µg/g		0.05	<0.05
Ethylbenzene	µg/g		0.05	<0.05
m&p-Xylene	µg/g		0.05	<0.05
Bromoform	µg/g		0.05	<0.05
Styrene	µg/g		0.05	<0.05
1,1,2,2-Tetrachloroethane	µg/g		0.05	<0.05
o-Xylene	µg/g		0.05	<0.05
1,3-Dichlorobenzene	µg/g		0.05	<0.05
1,4-Dichlorobenzene	µg/g		0.05	<0.05
1,2-Dichlorobenzene	µg/g		0.05	<0.05
1,2,4-Trichlorobenzene	µg/g		0.05	<0.05
VH	µg/g		10	<10
VPH	µg/g		10	<10
Total Xylenes	µg/g		0.2	<0.2
Surrogate	Unit	Acceptable Limits		
Bromofluorobenzene	%	60-140		95
Dibromofluoromethane	%	60-140		114
Toluene - d8	%	60-140		114

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8814898 Results are based on dry weight of sample.

Certified By:

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N271535

PROJECT: 1657709-5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Soil Analysis

RPT Date:			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Public Works Metals in Soil															
Aluminum	8813177		34300	33600	2.0%	< 10	108%	70%	130%	103%	90%	110%			
Antimony	8813177		0.4	0.3	NA	< 0.1	101%	70%	130%	99%	90%	110%			
Arsenic	8813177		9.1	8.8	2.9%	< 0.1	113%	70%	130%	107%	90%	110%			
Barium	8813177		147	136	7.7%	< 0.5	104%	70%	130%	101%	90%	110%			
Beryllium	8813177		0.8	0.7	9.4%	< 0.1	97%	70%	130%	99%	90%	110%			
Bismuth	8813177		<0.5	<0.5	NA	< 0.5				104%	85%	115%			
Cadmium	8813177		0.44	0.42	3.6%	< 0.01	107%	70%	130%	95%	90%	110%			
Calcium	8813177		4040	4290	6.0%	< 10	109%	70%	130%	97%	90%	110%			
Chromium	8813177		51	48	7.7%	< 1	104%	70%	130%	102%	90%	110%			
Cobalt	8813177		12.4	12.0	3.0%	< 0.1	101%	70%	130%	95%	90%	110%			
Copper	8813177		62.6	58.1	7.5%	< 0.2	102%	70%	130%	105%	90%	110%			
Iron	8813177		33300	34100	2.4%	< 10	106%	70%	130%	99%	90%	110%			
Lead	8813177		169	153	10.5%	< 0.1	93%	70%	130%	99%	90%	110%			
Lithium	8813177		19.9	20.1	0.9%	< 0.5				100%	85%	115%			
Magnesium	8813177		5510	6450	15.7%	< 10	115%	70%	130%	105%	90%	110%			
Manganese	8813177		276	306	10.1%	< 1	97%	70%	130%	104%	90%	110%			
Mercury	8813177		0.05	0.04	NA	< 0.01	80%	70%	130%	107%	90%	110%			
Molybdenum	8813177		1.7	1.6	3.8%	< 0.2	98%	70%	130%	97%	90%	110%			
Nickel	8813177		46.3	43.0	7.5%	< 0.5	106%	70%	130%	102%	90%	110%			
Phosphorus	8813177		784	788	0.5%	< 5	111%	70%	130%	102%	90%	110%			
Potassium	8813177		949	912	4.0%	< 5	113%	70%	130%	101%	90%	110%			
Selenium	8813177		1.1	1.0	3.4%	< 0.1				95%	90%	110%			
Silver	8813177		<0.5	<0.5	NA	< 0.5	108%	70%	130%	97%	90%	110%			
Sodium	8813177		348	339	2.7%	< 5	113%	70%	130%	91%	90%	110%			
Strontium	8813177		29	29	2.6%	< 1	103%	70%	130%	106%	90%	110%			
Thallium	8813177		0.1	0.1	NA	< 0.1	112%	70%	130%	98%	90%	110%			
Titanium	8813177		738	788	6.6%	< 1				96%	90%	110%			
Uranium	8813177		1.5	1.4	7.0%	< 0.2	103%	70%	130%	99%	90%	110%			
Vanadium	8813177		93	90	2.7%	< 1	106%	70%	130%	99%	90%	110%			
Zinc	8813177		108	105	2.5%	< 1	107%	70%	130%	108%	90%	110%			
Zirconium	8813177		2.9	2.7	5.0%	< 0.1				98%	90%	110%			
pH 1:2	8813177		5.55	5.50	0.9%		96%	90%	110%	100%	95%	105%			

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Certified By:

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N271535

PROJECT: 1657709-5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis

RPT Date:			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Public Works LEPH/HEPH in Soil Low Level															
Naphthalene	68078	8814892	<0.005	<0.005	NA	< 0.005	101%	80%	120%				94%	50%	130%
2-Methylnaphthalene	68078	8814892	<0.005	<0.005	NA	< 0.005	98%	80%	120%				84%	50%	130%
1-Methylnaphthalene	68078	8814892	<0.005	<0.005	NA	< 0.005	101%	80%	120%				89%	50%	130%
Acenaphthylene	68078	8814892	<0.005	<0.005	NA	< 0.005	100%	80%	120%				85%	50%	130%
Acenaphthene	68078	8814892	<0.005	<0.005	NA	< 0.005	101%	80%	120%				98%	50%	130%
Fluorene	68078	8814892	<0.02	<0.02	NA	< 0.02	101%	80%	120%				91%	50%	130%
Phenanthrene	68078	8814892	<0.02	<0.02	NA	< 0.02	97%	80%	120%				85%	60%	130%
Anthracene	68078	8814892	<0.004	<0.004	NA	< 0.004	104%	80%	120%				91%	60%	130%
Fluoranthene	68078	8814892	<0.01	<0.01	NA	< 0.01	101%	80%	120%				96%	60%	130%
Pyrene	68078	8814892	<0.01	<0.01	NA	< 0.01	100%	80%	120%				91%	60%	130%
Benzo(a)anthracene	68078	8814892	<0.03	<0.03	NA	< 0.03	101%	80%	120%				86%	60%	130%
Chrysene	68078	8814892	<0.05	<0.05	NA	< 0.05	102%	80%	120%				95%	60%	130%
Benzo(b)fluoranthene	68078	8814892	<0.05	<0.05	NA	< 0.05	98%	80%	120%				84%	60%	130%
Benzo(j)fluoranthene	68078	8814892	<0.05	<0.05	NA	< 0.05	103%	80%	120%				90%	60%	130%
Benzo(k)fluoranthene	68078	8814892	<0.05	<0.05	NA	< 0.05	102%	80%	120%				88%	60%	130%
Benzo(a)pyrene	68078	8814892	<0.03	<0.03	NA	< 0.03	103%	80%	120%				95%	60%	130%
Indeno(1,2,3-c,d)pyrene	68078	8814892	<0.02	<0.02	NA	< 0.02	101%	80%	120%				99%	60%	130%
Dibenzo(a,h)anthracene	68078	8814892	<0.005	<0.005	NA	< 0.005	101%	80%	120%				95%	60%	130%
Benzo(g,h,i)perylene	68078	8814892	<0.05	<0.05	NA	< 0.05	101%	80%	120%				104%	60%	130%
Quinoline	68078	8814892	<0.05	<0.05	NA	< 0.05	100%	80%	120%				107%	50%	130%
EPH C10-C19	68078	8814892	56	74	NA	< 20	108%	70%	130%				89%	65%	120%
EPH C19-C32	68078	8814892	381	442	14.8%	< 20	101%	70%	130%				88%	80%	120%
Naphthalene - d8	68078	8814892	58	62	6.7%		113%	80%	120%				102%	50%	130%
2-Fluorobiphenyl	68078	8814892	70	76	8.2%		108%	80%	120%				101%	50%	130%
P-Terphenyl - d14	68078	8814892	81	85	4.8%		117%	80%	120%				105%	60%	130%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

BTEX / VPH (C6-C10) Soil															
Methyl tert-butyl ether (MTBE)	68078	8818959	<0.1	<0.1	NA	< 0.1	97%	80%	120%				104%	70%	130%
Benzene	68078	8818959	<0.02	<0.02	NA	< 0.02	97%	80%	120%				98%	70%	130%
Toluene	68078	8818959	<0.05	<0.05	NA	< 0.05	96%	80%	120%				107%	70%	130%
Ethylbenzene	68078	8818959	<0.05	<0.05	NA	< 0.05	98%	80%	120%				107%	70%	130%
m&p-Xylene	68078	8818959	0.11	0.11	NA	< 0.05	97%	80%	120%				107%	70%	130%
o-Xylene	68078	8818959	<0.05	<0.05	NA	< 0.05	97%	80%	120%				103%	70%	130%
Styrene	68078	8818959	<0.05	<0.05	NA	< 0.05	100%	80%	120%				102%	70%	130%
VPH	68078	8818959	<10	<10	NA	< 10									
VH	68078	8818959	<10	<10	NA	< 10									
Bromofluorobenzene	68078	8818959	107	110	2.8%		101%	60%	140%				94%	60%	140%
Dibromofluoromethane	68078	8818959	113	111	1.8%		101%	60%	140%				94%	60%	140%

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
AGAT WORK ORDER: 17N271535
PROJECT: 1657709-5000
ATTENTION TO: Erin O'Brien
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date:			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Toluene - d8	68078	8818959	125	125	0.0%		100%	60%	140%				106%	60%	140%
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
Volatile Organic Compounds in Soil															
Chloromethane	68078	8814898	<0.05	<0.05	NA	< 0.05	100%	80%	120%				98%	60%	140%
Vinyl Chloride	68078	8814898	<0.05	<0.05	NA	< 0.05	100%	80%	120%				87%	60%	140%
Bromomethane	68078	8814898	<0.05	<0.05	NA	< 0.05	98%	80%	120%				115%	60%	140%
Chloroethane	68078	8814898	<0.05	<0.05	NA	< 0.05	101%	80%	120%				108%	60%	140%
Trichlorofluoromethane	68078	8814898	<0.05	<0.05	NA	< 0.05	100%	80%	120%				95%	70%	130%
Acetone	68078	8814898	<0.5	<0.5	NA	< 0.5	100%	80%	120%				104%	70%	130%
1,1-Dichloroethene	68078	8814898	<0.05	<0.05	NA	< 0.05	100%	80%	120%				97%	70%	130%
Dichloromethane	68078	8814898	<0.05	<0.05	NA	< 0.05	100%	80%	120%				100%	70%	130%
Methyl tert-butyl ether (MTBE)	68078	8814898	<0.1	<0.1	NA	< 0.1	101%	80%	120%				96%	70%	130%
2-Butanone (MEK)	68078	8814898	<0.5	<0.5	NA	< 0.5	101%	80%	120%				89%	70%	130%
trans-1,2-Dichloroethene	68078	8814898	<0.05	<0.05	NA	< 0.05	100%	80%	120%				98%	70%	130%
1,1-Dichloroethane	68078	8814898	<0.05	<0.05	NA	< 0.05	101%	80%	120%				98%	70%	130%
cis-1,2-Dichloroethene	68078	8814898	<0.05	<0.05	NA	< 0.05	101%	80%	120%				98%	70%	130%
Chloroform	68078	8814898	<0.05	<0.05	NA	< 0.05	101%	80%	120%				95%	70%	130%
1,2-Dichloroethane	68078	8814898	<0.05	<0.05	NA	< 0.05	101%	80%	120%				88%	70%	130%
1,1,1-Trichloroethane	68078	8814898	<0.05	<0.05	NA	< 0.05	101%	80%	120%				90%	70%	130%
Carbon Tetrachloride	68078	8814898	<0.02	<0.02	NA	< 0.02	101%	80%	120%				87%	70%	130%
Benzene	68078	8814898	<0.02	<0.02	NA	< 0.02	101%	80%	120%				99%	70%	130%
1,2-Dichloropropane	68078	8814898	<0.05	<0.05	NA	< 0.05	101%	80%	120%				99%	70%	130%
Trichloroethene	68078	8814898	<0.01	<0.01	NA	< 0.01	101%	80%	120%				94%	70%	130%
Bromodichloromethane	68078	8814898	<0.05	<0.05	NA	< 0.05	101%	80%	120%				92%	70%	130%
trans-1,3-Dichloropropene	68078	8814898	<0.05	<0.05	NA	< 0.05	102%	80%	120%				89%	60%	140%
4-Methyl-2-pentanone (MIBK)	68078	8814898	<0.5	<0.5	NA	< 0.5	102%	80%	120%				86%	70%	130%
cis-1,3-Dichloropropene	68078	8814898	<0.05	<0.05	NA	< 0.05	101%	80%	120%				94%	60%	140%
1,1,2-Trichloroethane	68078	8814898	<0.05	<0.05	NA	< 0.05	101%	80%	120%				92%	70%	130%
Toluene	68078	8814898	<0.05	<0.05	NA	< 0.05	101%	80%	120%				98%	70%	130%
Dibromochloromethane	68078	8814898	<0.05	<0.05	NA	< 0.05	102%	80%	120%				91%	70%	130%
Ethylene Dibromide	68078	8814898	<0.05	<0.05	NA	< 0.05	101%	80%	120%				91%	70%	130%
Tetrachloroethene	68078	8814898	<0.05	<0.05	NA	< 0.05	101%	80%	120%				91%	70%	130%
1,1,1,2-Tetrachloroethane	68078	8814898	<0.05	<0.05	NA	< 0.05	101%	80%	120%				95%	70%	130%
Chlorobenzene	68078	8814898	<0.05	<0.05	NA	< 0.05	101%	80%	120%				96%	70%	130%
Ethylbenzene	68078	8814898	<0.05	<0.05	NA	< 0.05	101%	80%	120%				96%	70%	130%
m&p-Xylene	68078	8814898	<0.05	<0.05	NA	< 0.05	101%	80%	120%				97%	70%	130%
Bromoform	68078	8814898	<0.05	<0.05	NA	< 0.05	102%	80%	120%				89%	70%	130%
Styrene	68078	8814898	<0.05	<0.05	NA	< 0.05	102%	80%	120%				95%	70%	130%
1,1,2,2-Tetrachloroethane	68078	8814898	<0.05	<0.05	NA	< 0.05	101%	80%	120%				94%	70%	130%

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N271535

PROJECT: 1657709-5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date:			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
o-Xylene	68078	8814898	<0.05	<0.05	NA	< 0.05	101%	80%	120%				97%	70%	130%
1,3-Dichlorobenzene	68078	8814898	<0.05	<0.05	NA	< 0.05	100%	80%	120%				97%	70%	130%
1,4-Dichlorobenzene	68078	8814898	<0.05	<0.05	NA	< 0.05	100%	80%	120%				96%	70%	130%
1,2-Dichlorobenzene	68078	8814898	<0.05	<0.05	NA	< 0.05	101%	80%	120%				95%	70%	130%
1,2,4-Trichlorobenzene	68078	8814898	<0.05	<0.05	NA	< 0.05	101%	80%	120%				87%	70%	130%
Bromofluorobenzene	68078	8814898	95	101	6.1%		107%	60%	140%				109%	60%	140%
Dibromofluoromethane	68078	8814898	114	126	10.0%		103%	60%	140%				104%	60%	140%
Toluene - d8	68078	8814898	114	125	9.2%		101%	60%	140%				110%	60%	140%
VH	68078	8814898	<10	<10	NA	< 10									
VPH	68078	8814898	<10	<10	NA	< 10									

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Glycols Analysis in Soil															
Propylene Glycol	150	8815288	<10	<10	NA	< 10	103%	70%	130%	100%	70%	130%	106%	60%	140%
Monoethylene Glycol	150	8815288	<10	<10	NA	< 10	104%	70%	130%	100%	70%	130%	105%	60%	140%
Diethylene Glycol	150	8815288	<10	<10	NA	< 10	103%	70%	130%	100%	70%	130%	105%	60%	140%
Triethylene Glycol	150	8815288	<10	<10	NA	< 10	101%	70%	130%	98%	70%	130%	104%	60%	140%
Tetraethylene Glycol	150	8815288	<10	<10	NA	< 10	97%	70%	130%	94%	70%	130%	108%	60%	140%

Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

Certified By:

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Method Summary

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Aluminum	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Antimony	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Arsenic	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Barium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Beryllium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Bismuth	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Cadmium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Calcium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Chromium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Cobalt	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Copper	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Iron	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Lead	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Lithium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Magnesium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Manganese	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP-MS
Mercury	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Molybdenum	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Nickel	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Phosphorus	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Potassium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Selenium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Silver	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Sodium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Strontium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP-MS
Thallium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Tin	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Titanium	MET-181-6106, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6010C	ICP/OES
Uranium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Vanadium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Zinc	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Zirconium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
pH 1:2	INOR-181-6031	BC MOE Lab Manual B (pH, Electrometric, Soil)	PH METER

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Naphthalene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
2-Methylnaphthalene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
1-Methylnaphthalene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthylene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluorene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Phenanthrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Chrysene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(b)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(j)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(k)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Indeno(1,2,3-c,d)pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Dibenzo(a,h)anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(g,h,i)perylene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Quinoline	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
IACR CCME (Soil)	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
B[a]P TPE (Soil)	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
EPH C10-C19	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
EPH C19-C32	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
LEPH C10-C19	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
HEPH C19-C32	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
Naphthalene - d8	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
2-Fluorobiphenyl	ORG-180-5102	Modified form BCMOE Lab Manual Section D (PAH)	GC/MS
P-Terphenyl - d14	ORG-180-5102	Modified form BCMOE Lab Manual Section D (PAH)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Benzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Toluene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Ethylbenzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
m&p-Xylene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
o-Xylene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Styrene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
VPH	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
VH	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Bromofluorobenzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Dibromofluoromethane	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Toluene - d8	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Propylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Monoethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Diethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Triethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Tetraethylene Glycol	TO-1410	EPA SW-846 8015	GC/FID
Heptanol	TO-1410	EPA SW-846 8015	GC/FID
Chloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Vinyl Chloride	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromomethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichlorofluoromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Acetone	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dichloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
2-Butanone (MEK)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,2-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
1,1-Dichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,2-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroform	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1-Trichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Carbon Tetrachloride	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Benzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloropropane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromodichloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,3-Dichloropropene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
4-Methyl-2-pentanone (MIBK)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,3-Dichloropropene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2-Trichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromochloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylene Dibromide	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Tetrachloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1,2-Tetrachloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylbenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
m&p-Xylene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromoform	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Styrene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2,2-Tetrachloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
o-Xylene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,3-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,4-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17N271535

PROJECT: 1657709-5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
1,2-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2,4-Trichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromofluorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromofluoromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene - d8	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
VH	ORG-180-5103	Modified from BC MOE Lab Manual Sec D (VOC)	GC/MS/FID
VPH	ORG-180-5103	Modified from BC MOE Lab Manual Sec D (VOC)	GC/MS/FID

V7N27 1535

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 04263 page 1 of 1

Golder Associates

200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709-5000			Laboratory Name: Agat
Short Title: K19 Remediation	Golder Contact: Erin O'Brien		Address: 120-8600 Glenlyon Parkway
Golder E-mail Address 1: andrew.bruemmer@golder.com	Golder E-mail Address 2: e'obrien@golder.com		Telephone/Fax: 250-774-6500
			Contact: Maggie Chan

Office Name: Vancouver

EQuIS Facility Code: 4823859
EQuIS upload: ☒

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☐ Regular (~~5 Days~~) 4 days
Criteria: ☒ CSR ☒ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Analyses Required

OCT 18 AM 11:27

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	metals	BTEX/VPH	LEPH/HEPH/PAHs	VOC	Glycols	RUSH (Select TAT above)	Remarks (over)
04263 - 01	Apec9-HA1	*	0.05 to 0.40	Soil	11/10/17	13:50	Discrete			5	X	X	X				8814 892
- 02	↓		1 to 1.5m			13:55				↓							894
- 03	APEC9-HA2		Hand auger NB 0.6			14:05											896
- 04	↓		1 to 1.5	↓	11/10/17	14:10	↓			5	X	X	X	X	X		898
- 05																	
- 06																	
- 07																	
- 08																	
- 09																	
- 10																	
- 11																	
- 12																	

Sampler's Signature:	Relinquished by: Signature	Company: Golder	Date: 11/10/17	Time: 4:32	Received by: Signature: Dropped in Lock Box	Company
Comments: Bill to Dave Osgnthorpe at FWGSC * On Ice	Method of Shipment:	Waybill No.:		Received for Lab by: Keen Ky	Date	Time
	Shipped by:	Shipment Condition: Seal Intact:		Temp (°C) 0°	Cooler opened by:	Date

V112126

WHITE: Golder Copy YELLOW: Lab Copy

ESED

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM

RECEIVING BASICS - Shipping

Company/Consultant: GOLDER

Courier: _____ (Prepaid) Collect

Waybill# _____

Branch: EDM GP (FN) FM RD VAN LYD FSJ EST Other: _____

Custody Seal Intact: Yes (No) NA

TAT: <24hr 24-48hr 48-72hr (Reg) Other _____

Cooler Quantity: 1

TIME SENSITIVE ISSUES - Shipping

ALREADY EXCEEDED HOLD TIME? Yes (No)

Inorganic Tests (Please Circle): Mibi , BOD , Nitrate/Nitrite , Turbidity , Microtox , Ortho PO4 , Tedlar Bag , Residual Chlorine , Chlorophyll* , Chloroamines*

Earliest Expiry: _____

Hydrocarbons: Earliest Expiry _____

SAMPLE INTEGRITY - Shipping

Hazardous Samples: YES (NO) Precaution Taken: _____

Legal Samples: Yes (No)

International Samples: Yes (No)

Tape Sealed: Yes (No)

Coolant Used: Icepack (Bagged Ice) Free Ice Free Water None

Temperature (Bottles/Jars only) N/A if only Soil Bags Received

FROZEN (Please Circle if samples received Frozen)

1 (Bottle/Jar) (0)+(0)+(0)=(0) °C 2(Bottle/Jar)___+___+___=____ °C

3 (Bottle/Jar)___+___+___=____ °C 4 (Bottle/Jar)___+___+___=____ °C

5 (Bottle/Jar)___+___+___=____ °C 6 (Bottle/Jar)___+___+___=____ °C

7 (Bottle/Jar)___+___+___=____ °C 8 (Bottle/Jar)___+___+___=____ °C

9 (Bottle/Jar)___+___+___=____ °C 10 (Bottle/Jar)___+___+___=____ °C

(If more than 10 coolers are received use another sheet of paper and attach)

LOGISTICS USE ONLY

Workorder No: _____

Samples Damaged: Yes (No) If YES why?

No Bubble Wrap Frozen Courier

Other: _____

Account Project Manager: _____ have they been notified of the above issues: Yes No

Whom spoken to: _____ Date/Time: _____

CPM Initial_____

General Comments: _____

* Subcontracted Analysis (See CPM)

Date issued: May 22, 2015

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM - BURNABY

Work Order # 17N2 71535

RECEIVING BASICS:

Received From: Rover Waybill #: _____

SAMPLE QUANTITIES:

Coolers: 1 Containers: 20

TIME SENSITIVE ISSUES:

Earliest Date Sampled: Oct 11, 2017 ALREADY EXCEEDED? Yes (No)

NON-CONFORMANCES:

3 temperatures of samples* and average of each cooler: (record differing temperatures on the CoC next to sample ID's) ***use jars when available**

(1) 0 + 0 + 0 = 0 °C (2) ___ + ___ + ___ = ___ °C (3) ___ + ___ + ___ = ___ °C (4) ___ + ___ + ___ = ___ °C

Was ice or ice pack present: (Yes) No

Integrity Issues:

Account Project Manager: _____ have they been notified of the above issues: Yes No

Whom spoken to: _____ Date and Time: _____

ADDITIONAL NOTES:

Samples are not frozen

AGAT Laboratories

5623 McADAM ROAD
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CANADA L4Z 1N9
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FAX (905)501-0589
http://www.agatlabs.com

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
219-800 BURRARD ST
VANCOUVER, BC V6Z 0B9
604-671-1831

ATTENTION TO:

PROJECT:

AGAT WORK ORDER: 17T252168

SOLID ANALYSIS REVIEWED BY: Kevin Motomura, Data Review Supervisor

DATE REPORTED: Aug 28, 2017

PAGES (INCLUDING COVER): 7

Should you require any information regarding this analysis please contact your client services representative at (905) 501-9998

*NOTES

All samples are stored at no charge for 90 days. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

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http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17T252168

PROJECT:

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO:

(201-074) Aqua Regia Digest - Metals Package, ICP/ICP-MS finish

DATE SAMPLED: Aug 22, 2017 | DATE RECEIVED: Aug 23, 2017 | DATE REPORTED: Aug 28, 2017 | SAMPLE TYPE: Other

Analyte:	Ag	Al	As	Au	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cs
Unit:	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	0.01	0.01	0.1	0.005	5	1	0.05	0.01	0.01	0.01	0.01	0.1	0.5	0.05
8620790A - Sample A (8659212)	0.27	0.47	2.3	0.036	<5	245	0.29	0.05	0.16	0.08	4.96	4.4	30.8	0.72
8620791A - Sample B (8659213)	0.20	0.23	3.5	0.022	<5	465	0.93	0.03	2.18	0.07	16.0	6.2	23.6	0.46
8620792A - Sample C (8659214)	0.21	0.34	4.6	0.014	<5	269	0.20	0.04	0.14	0.05	4.29	3.2	28.1	0.63

Analyte:	Cu	Fe	Ga	Ge	Hf	Hg	In	K	La	Li	Mg	Mn	Mo	Na
Unit:	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%
Sample ID (AGAT ID) RDL:	0.5	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.1	0.1	0.01	1	0.05	0.01
8620790A - Sample A (8659212)	9.7	1.14	1.10	<0.05	0.12	0.04	0.017	0.09	1.9	10.1	0.11	37	0.53	<0.01
8620791A - Sample B (8659213)	5.1	14.4	0.82	0.09	0.13	0.03	0.013	0.06	6.5	5.1	1.04	1440	4.64	0.01
8620792A - Sample C (8659214)	4.7	0.91	0.91	<0.05	0.08	0.02	0.018	0.08	1.7	7.9	0.09	28	0.72	<0.01

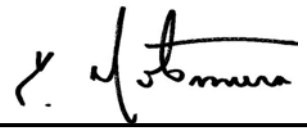
Analyte:	Nb	Ni	P	Pb	Rb	Re	S	Sb	Sc	Se	Sn	Sr	Ta	Te
Unit:	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	0.05	0.5	10	0.1	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01
8620790A - Sample A (8659212)	0.11	12.4	469	6.6	6.3	<0.001	0.02	0.20	1.8	0.4	0.3	15.2	<0.01	0.02
8620791A - Sample B (8659213)	0.12	14.0	6810	5.1	4.1	0.001	0.09	0.43	8.0	<0.2	0.2	96.5	<0.01	0.06
8620792A - Sample C (8659214)	0.08	11.6	523	6.9	5.7	<0.001	0.01	0.27	1.3	<0.2	0.3	15.7	<0.01	0.05

Analyte:	Th	Ti	Tl	U	V	W	Y	Zn	Zr
Unit:	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Sample ID (AGAT ID) RDL:	0.1	0.005	0.01	0.05	0.5	0.05	0.05	0.5	0.5
8620790A - Sample A (8659212)	2.7	<0.005	0.05	0.69	22.2	0.09	6.23	66.1	3.2
8620791A - Sample B (8659213)	3.2	<0.005	0.05	1.33	63.6	0.12	24.4	47.8	5.0
8620792A - Sample C (8659214)	2.3	<0.005	0.05	0.43	18.5	<0.05	4.36	55.2	2.6

Comments: RDL - Reported Detection Limit

8659212-8659214 Au determination by this method is semi-quantitative due to small sample size.

Certified By:



AGAT Laboratories

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http://www.agatlabs.com

Quality Assurance - Replicate

AGAT WORK ORDER: 17T252168

PROJECT:

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO:

(201-074) Aqua Regia Digest - Metals Package, ICP/ICP-MS finish

	REPLICATE #1															
Parameter	Sample ID	Original	Replicate	RPD												
Ag	8659212	0.27	0.28	3.6%												
Al	8659212	0.47	0.47	0.0%												
As	8659212	2.3	2.7	16.0%												
Au	8659212	0.036	0.025													
B	8659212	< 5	< 5	0.0%												
Ba	8659212	245	263	7.1%												
Be	8659212	0.286	0.260	9.5%												
Bi	8659212	0.046	0.043	6.7%												
Ca	8659212	0.16	0.16	0.0%												
Cd	8659212	0.08	0.07	13.3%												
Ce	8659212	4.96	5.06	2.0%												
Co	8659212	4.4	4.4	0.0%												
Cr	8659212	30.8	30.2	2.0%												
Cs	8659212	0.72	0.74	2.7%												
Cu	8659212	9.65	8.41	13.7%												
Fe	8659212	1.14	1.12	1.8%												
Ga	8659212	1.10	1.15	4.4%												
Ge	8659212	< 0.05	0.07													
Hf	8659212	0.116	0.114	1.7%												
Hg	8659212	0.04	< 0.01													
In	8659212	0.0167	0.0163	2.4%												
K	8659212	0.09	0.09	0.0%												
La	8659212	1.9	1.9	0.0%												
Li	8659212	10.1	10.2	1.0%												
Mg	8659212	0.11	0.11	0.0%												
Mn	8659212	37	29													
Mo	8659212	0.525	0.440	17.6%												
Na	8659212	< 0.01	< 0.01	0.0%												
Nb	8659212	0.11	0.10	9.5%												
Ni	8659212	12.4	12.9	4.0%												
P	8659212	469	493	5.0%												

AGAT Laboratories

Quality Assurance - Replicate

AGAT WORK ORDER: 17T252168

PROJECT:

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CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO:

Pb	8659212	6.6	6.1	7.9%												
Rb	8659212	6.32	6.60	4.3%												
Re	8659212	< 0.001	< 0.001	0.0%												
S	8659212	0.02	0.02	0.0%												
Sb	8659212	0.203	0.222	8.9%												
Sc	8659212	1.8	1.8	0.0%												
Se	8659212	0.4	0.4	0.0%												
Sn	8659212	0.28	0.23	19.6%												
Sr	8659212	15.2	13.8	9.7%												
Ta	8659212	< 0.01	< 0.01	0.0%												
Te	8659212	0.02	0.03													
Th	8659212	2.72	2.75	1.1%												
Ti	8659212	< 0.005	< 0.005	0.0%												
Tl	8659212	0.05	0.05	0.0%												
U	8659212	0.69	0.69	0.0%												
V	8659212	22.2	22.2	0.0%												
W	8659212	0.087	0.083	4.7%												
Y	8659212	6.23	6.26	0.5%												
Zn	8659212	66.1	61.5	7.2%												
Zr	8659212	3.2	3.5	9.0%												

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Quality Assurance - Certified Reference materials

AGAT WORK ORDER: 17T252168

PROJECT:

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO:

(201-074) Aqua Regia Digest - Metals Package, ICP/ICP-MS finish

	CRM #1 (ref.CDN-ME-1304)															
Parameter	Expect	Actual	Recovery	Limits												
Ag	34.0	36.7	107%	90% - 110%												
Cu	2680	2641	99%	90% - 110%												
Pb	2580	2673	104%	90% - 110%												
Zn	2200	2157	98%	90% - 110%												

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Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17T252168

PROJECT:

ATTENTION TO:

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Solid Analysis			
Ag	MIN-200-12018		ICP-MS
Al	MIN-200-12018		ICP/OES
As	MIN-200-12018		ICP-MS
Au	MIN-200-12018		ICP-MS
B	MIN-200-12018		ICP/OES
Ba	MIN-200-12018		ICP-MS
Be	MIN-200-12018		ICP-MS
Bi	MIN-200-12018		ICP-MS
Ca	MIN-200-12018		ICP/OES
Cd	MIN-200-12018		ICP-MS
Ce	MIN-200-12018		ICP-MS
Co	MIN-200-12018		ICP-MS
Cr	MIN-200-12018		ICP/OES
Cs	MIN-200-12018		ICP-MS
Cu	MIN-200-12018		ICP-MS
Fe	MIN-200-12018		ICP/OES
Ga	MIN-200-12018		ICP-MS
Ge	MIN-200-12018		ICP-MS
Hf	MIN-200-12018		ICP-MS
Hg	MIN-200-12018		ICP-MS
In	MIN-200-12018		ICP-MS
K	MIN-200-12018		ICP/OES
La	MIN-200-12018		ICP-MS
Li	MIN-200-12018		ICP-MS
Mg	MIN-200-12018		ICP/OES
Mn	MIN-200-12018		ICP/OES
Mo	MIN-200-12018		ICP-MS
Na	MIN-200-12018		ICP/OES
Nb	MIN-200-12018		ICP-MS
Ni	MIN-200-12018		ICP-MS
P	MIN-200-12018		ICP/OES
Pb	MIN-200-12018		ICP-MS
Rb	MIN-200-12018		ICP-MS
Re	MIN-200-12018		ICP-MS
S	MIN-200-12018		ICP/OES
Sb	MIN-200-12018		ICP-MS
Sc	MIN-200-12018		ICP-MS
Se	MIN-200-12018		ICP-MS
Sn	MIN-200-12018		ICP-MS
Sr	MIN-200-12018		ICP-MS
Ta	MIN-200-12018		ICP-MS
Te	MIN-200-12018		ICP-MS
Th	MIN-200-12018		ICP-MS
Ti	MIN-200-12018		ICP/OES
Tl	MIN-200-12018		ICP-MS
U	MIN-200-12018		ICP-MS
V	MIN-200-12018		ICP/OES
W	MIN-200-12018		ICP-MS
Y	MIN-200-12018		ICP-MS

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Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17T252168

PROJECT:

ATTENTION TO:

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Zn	MIN-200-12018		ICP-MS
Zr	MIN-200-12018		ICP-MS

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Canada
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CERTIFICATE OF ANALYSIS • COVER PAGE

Client:	PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
Mailing Address:	219-800 BURRARD ST
	VANCOUVER, BC V6Z0B9
Attention To:	Erin O'Brien
E-mail Address:	eobrien@golder.com
Contact No:	(604) 296-4200
Fax No:	(604) 298-5253

Client Project Name:	K19
Client Project Number:	1657709/5000

Results:		
Reported To:	**1**	eobrien@golder.com
	2	akaul@golder.com
	3	
	4	
Date Reported:		25-Aug-17

Invoice:	
Submitted To:	eobrien@golder.com
Date Submitted:	25-Aug-17

AGAT Work Order:	17F246688
Report Version:	1
Pages (Including Cover):	4

Analysis Reviewed By:	Andrew Garrard, B.Sc., General Manager
Report Certified By:	Andrew Garrard, B.Sc., General Manager
Signature:	

Should you require any further information regarding this analysis please contact your client services representative at (778) 452 4000

Notes:

Note: All samples are stored at no charge for 90 days. Please contact the lab if you require additional sample storage time.

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Results relate only to the items tested and all the items tested

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www.agatlabs.com

CERTIFICATE OF ANALYSIS ▪ SAMPLE DETAILS

AGAT WORK ORDER: 17F246688
REPORT VERSION: 1

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
PROJECT NO: 1657709/5000

S. No.	AGAT Sample ID	Client Sample ID	Sample Type	Condition	Received Sample Wt (kg)	Dry Sample Wt. (kg)
1	8620790	05377-01	Rock	Wet	1.91	1.92
2	8620791	05377-02	Rock	Wet	3.31	3.26
3	8620792	05377-03	Rock	Wet	2.71	2.68
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
				Total Sample Weight Received (kg):	**8**	

Sample Receipt Info:	
Date Samples Received:	3-Aug-17
No. of Samples Received:	3
Samples Received By:	R. Nelsen

Analytical Instructions:	
From:	E. O'Brien
Date:	3-Aug-17

Date of Analysis:	
Paste pH:	17-Aug-17
Fizz Rating:	17-Aug-17
Rinse pH:	NA
Carbonate Carbon (CO2):	NA
Total Carbon:	NA
Total Organic Carbon:	NA
Total Sulphur:	9-Aug-17
Sulphate Sulphur:	9-Aug-17
Neutralization Potential (NP):	17-Aug-17
Siderite NP:	NA

Results relate only to the items tested and all the items tested

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CERTIFICATE OF ANALYSIS • ABA RESULTS

AGAT WORK ORDER: 17F246688
REPORT VERSION: 1

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
PROJECT NO: 1657709/5000

S. No.	AGAT Sample ID	Client Sample ID	Paste pH	Fizz Rating	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	Maximum Potential Acidity (MPA)	Mod. ABA NP Neutralization Potential (NP)	Net Neutralization Potential (NNP)	Neutralization Potential Ratio (NPR)
Units:			**pH Units**		**(wt %)**	**(wt %)**	**(wt %)**	**(kg CaCO3/tonne)**	**(kg CaCO3/tonne)**	**(kg CaCO3/tonne)**	
Reported Detection Limit (RDL):			*0.1*		*0.01*	*0.01*	*0.02*	*0.2*			
1	8620790	05377-01	8.1	None	0.03	0.02	<0.02	<0.2	6.3	6.3	NA
2	8620791	05377-02	8.4	Slight	0.08	0.01	0.07	2.2	32.8	30.6	15.0
3	8620792	05377-03	7.3	None	0.03	0.02	<0.02	<0.2	3.1	3.1	NA

QUALITY ASSURANCE											
Replicate Analysis:											
10	**8620790**	**05377-01**	**8.1**	**None**	**0.03**	**0.02**	**<0.02**	**<0.2**	**6.3**	**6.3**	**NA**
10 R	**8620790 R**	**05377-01 R**	**8.1**	**None**	**0.03**	**0.02**	**<0.02**	**<0.2**	**4.1**	**4.1**	**NA**
Reference Material Analysis:											
Reference Material			IN-HOUSE REF 1		KZK-1	RTS-3a			KZK-1		
Ref. Material Certified/Informational Value			9.2		0.80	0.10			58.9		
Reference Material Results			9.2		0.81	0.11			53.6		
Method Blank Analysis:											
Method Blank Results						<0.01					
Method Blank Spike Recovery (%)						92					

Notes:

pH of DI water used: 4.85

EC of DI water used: <2

R = Replicate; D = Duplicate

NA = A result is not calculated when the MPA is <0.2

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CERTIFICATE OF ANALYSIS ▪ METHOD SUMMARY

AGAT WORK ORDER: 17F246688
REPORT VERSION: 1

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
PROJECT NO: 1657709/5000

Parameter	AGAT S.O.P	Literature Reference	Analytical Technique
Sample Preparation	ARD-181-18007	ASTM E877-08; MEND Report 1.20.1, Version 0 (2009)	Crusher/Pulverizer
Paste pH (Near Saturation)	ARD-181-18003	Sobek, A.A., Schuller, W.A., Freeman, J.R. and Smith, R.M.; EPA-600/2-78-054 (1978)	pH Meter
Fizz Rating	ARD-181-18000	Lawrence, R. W., Poling, G.P. and Marchant, P.B., MEND Project 1.16.1a (1989); MEND Acid Rock Drainage Prediction Manual, MEND Project 1.16.1b, Section 6.2.3 (March 1991)	Observation
Total Sulphur	INOR-181-6027	modified from ASTM E1915-11	Combustion TC
Sulphate Sulphur	ARD-181-18009;	modified from MEND Report 1.20.1, Version 0 (2009);	HCl Extraction
	INOR-181-6028	modified from SM 4500-SO_4^{2-} E	UV-Vis Spectrophotometer
Sulphide Sulphur			Calculation
Maximum Potential Acidity			Calculation
Neutralization Potential **(Modified ABA NP)**	ARD-181-18000	Lawrence, R. W., Poling, G.P. and Marchant, P.B., MEND Project 1.16.1a (1989); MEND Acid Rock Drainage Prediction Manual, MEND Project 1.16.1b, Section 6.2.3 (March 1991)	Titration
Net Neutralization Potential			Calculation
Neutralization Potential Ratio			Calculation

CALCULATIONS:

Sulphide Sulphur: difference between total sulphur and sulphate sulphur

Maximum Potential Acidity (MPA): is based on sulphide sulphur

Net Neutralization Potential (NNP): difference between NP and MPA

Neutralization Potential Ratio (NPR): NP/MPA

METHOD DESCRIPTIONS:

Sample Preparation

ABA: Air-dried or oven dried at 55 ± 5 °C (if samples arrive wet), crushed (if necessary), split by riffling, and pulverized to 85% passing 200 mesh (75 µm).

Analytical

Paste pH: DDI water is added to the prepared sample to form a paste at near saturation. The volume of water added varies depending on the sample's tendency to absorb water. A pH probe is placed in the paste slurry and the pH is read directly from the meter.

Fizz Rating: One to two drops of 25% HCl is added to a sample aliquot and the degree of reaction observed and rated. The presence of $CaCO_3$ is indicated by a bubbling or audible "fizz" sound.

Sulphate Sulphur: Pulp samples are treated with dilute HCl and boiled for 30 minutes at ~80 °C. The digested sample is then re-constituted with DI water and filtered. Filtered extracts are then analyzed by the turbidimetric method using a UV-Vis spectrophotometer. The analytical results are back-calculated to the initial pulp sample weight and expressed in weight % Sulphate Sulphur.

Modified ABA NP: A pulp sample is digested with a known excess of standardized HCl at room temperature for a period of 24 hours in order to determine the amount of neutralizing bases present in the sample. The residual acid solution is titrated to pH 8.3 with standardized NaOH in order to determine the amount of acid consumed by the original sample.

Results relate only to the items tested and all the items tested

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CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
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604-671-1831

ATTENTION TO: Erin O'Brien

PROJECT: 1657709/5000

AGAT WORK ORDER: 17F246688

WATER ANALYSIS REVIEWED BY: Andrew Garrard, B.Sc., General Manager

DATE REPORTED: Aug 25, 2017

PAGES (INCLUDING COVER): 10

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (778) 452-4000

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

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Certificate of Analysis

AGAT WORK ORDER: 17F246688

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Shake Flask Extraction - Dissolved Metals

DATE RECEIVED: 2017-08-04

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		Method Blank		05377-01	05377-02	05377-03
		SAMPLE TYPE:		SFE		SFE	SFE	SFE
		DATE SAMPLED:						
Parameter	Unit	G / S	RDL	8620794	RDL	8620795	8620797	8620798
Weight of Dry Sample	g			0		250	250	250
Volume of DI Water	mL			750		750	750	750
Silver Dissolved	mg/L		0.00008	<0.00008	0.00008	<0.00008	<0.00008	<0.00008
Aluminum Dissolved	mg/L		0.001	<0.001	0.001	0.202	0.007	0.215
Arsenic Dissolved	mg/L		0.0002	<0.0002	0.0002	0.0002	<0.0002	0.0006
Boron Dissolved	mg/L		0.01	<0.01	0.01	<0.01	<0.01	0.01
Barium Dissolved	mg/L		0.0002	0.0006	0.0002	0.0353	0.121	0.0443
Beryllium Dissolved	mg/L		0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001
Bismuth Dissolved	mg/L		0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001
Calcium Dissolved	mg/L		0.05	0.05	0.05	0.89	8.22	1.25
Cadmium Dissolved	mg/L		0.00001	<0.00001	0.00001	<0.00001	<0.00001	<0.00001
Cobalt Dissolved	mg/L		0.0001	<0.0001	0.0001	0.0003	<0.0001	0.0002
Chromium Dissolved	mg/L		0.0005	<0.0005	0.0005	0.0009	<0.0005	<0.0005
Copper Dissolved	mg/L		0.0005	<0.005	0.0005	0.0018	<0.0005	0.0015
Iron Dissolved	mg/L		0.02	<0.02	0.02	0.21	<0.02	0.21
Mercury Dissolved	mg/L		0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005
Potassium Dissolved	mg/L		0.05	<0.05	0.05	1.01	2.29	0.98
Lithium Dissolved	mg/L		0.0005	<0.0005	0.0005	0.0039	0.0039	0.0055
Magnesium Dissolved	mg/L		0.005	<0.005	0.05	0.47	6.79	0.53
Manganese Dissolved	mg/L		0.0002	0.0002	0.0002	0.0044	0.0126	0.0051
Molybdenum Dissolved	mg/L		0.0001	<0.0001	0.0001	0.0004	0.0034	0.0002
Sodium Dissolved	mg/L		0.02	0.02	0.02	0.20	0.27	0.25
Nickel Dissolved	mg/L		0.0005	<0.0005	0.0005	0.0011	0.0008	0.0012
Phosphorus Dissolved	mg/L		0.05	<0.05	0.05	<0.05	<0.05	<0.05
Lead Dissolved	mg/L		0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005
Sulphur Dissolved	mg/L		0.5	<0.5	0.5	<0.5	4.2	1.3
Antimony Dissolved	mg/L		0.0001	<0.0001	0.0001	0.0001	<0.0001	<0.0001
Selenium Dissolved	mg/L		0.0005	<0.0005	0.0005	0.0020	0.0034	<0.0005
Silicon Dissolved	mg/L		0.05	<0.05	0.05	0.94	0.29	1.25
Tin Dissolved	mg/L		0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005

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Certificate of Analysis

AGAT WORK ORDER: 17F246688

PROJECT: 1657709/5000

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Shake Flask Extraction - Dissolved Metals

DATE RECEIVED: 2017-08-04

DATE REPORTED: 2017-08-24

		SAMPLE DESCRIPTION:		Method Blank		05377-01	05377-02	05377-03
		SAMPLE TYPE:		SFE		SFE	SFE	SFE
		DATE SAMPLED:						
Parameter	Unit	G / S	RDL	8620794	RDL	8620795	8620797	8620798
Strontium Dissolved	mg/L		0.0002	<0.0002	0.0002	0.0070	0.0491	0.0135
Tellurium Dissolved	mg/L		0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002
Thorium Dissolved	mg/L		0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001
Titanium Dissolved	mg/L		0.0005	<0.0005	0.0005	0.0125	<0.0005	0.0128
Thallium Dissolved	mg/L		0.00005	<0.00005	0.00005	<0.00005	<0.00005	<0.00005
Uranium Dissolved	mg/L		0.00005	<0.00005	0.00005	<0.00005	<0.00005	<0.00005
Vanadium Dissolved	mg/L		0.001	<0.001	0.001	0.002	<0.001	0.003
Tungsten Dissolved	mg/L		0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001
Zinc Dissolved	mg/L		0.001	0.001	0.001	0.004	0.002	0.004
Zirconium Dissolved	mg/L		0.0001	<0.0001	0.0001	0.0004	<0.0001	0.0003

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17F246688

PROJECT: 1657709/5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Water Analysis

RPT Date:			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Shake Flask Extraction - Dissolved Metals															
Silver Dissolved	8649349		<0.00008	<0.00008	NA	< 0.00008				95%	90%	110%			
Aluminum Dissolved	8649349		0.004	0.004	NA	< 0.001				99%	90%	110%			
Arsenic Dissolved	8649349		<0.0002	<0.0002	NA	< 0.0002				106%	90%	110%			
Boron Dissolved	8649349		0.01	0.01	NA	< 0.01				105%	90%	110%			
Barium Dissolved	8649349		0.185	0.182	1.4%	< 0.0002				98%	90%	110%			
Beryllium Dissolved	8649349		<0.0001	<0.0001	NA	< 0.0001				91%	90%	110%			
Bismuth Dissolved	8649349		<0.0001	<0.0001	NA	< 0.0001				92%	90%	110%			
Calcium Dissolved	8647935		18.6	18.5	0.9%	< 0.05				103%	90%	110%			
Cadmium Dissolved	8649349		0.00002	0.00002	NA	< 0.00001				97%	90%	110%			
Cobalt Dissolved	8649349		<0.0001	<0.0001	NA	< 0.0001				102%	90%	110%			
Chromium Dissolved	8649349		<0.0005	<0.0005	NA	< 0.0005				106%	90%	110%			
Copper Dissolved	8649349		0.0007	0.0008	NA	< 0.0005				109%	90%	110%			
Iron Dissolved	8647935		0.06	0.06	NA	< 0.02				102%	90%	110%			
Mercury Dissolved	8649349		<0.0005	<0.0005	NA	< 0.0005				91%	90%	110%			
Potassium Dissolved	8647935		1.11	1.11	0.6%	< 0.05				102%	90%	110%			
Lithium Dissolved	8649349		0.0087	0.0087	0.6%	< 0.0005				102%	90%	110%			
Magnesium Dissolved	8649349		14.6	14.7	0.7%	< 0.005				96%	90%	110%			
Manganese Dissolved	8649349		0.0008	0.0008	NA	< 0.0002				108%	90%	110%			
Molybdenum Dissolved	8649349		0.0005	0.0005	NA	< 0.0001				97%	90%	110%			
Sodium Dissolved	8647935		102	102	0.2%	< 0.02				102%	90%	110%			
Nickel Dissolved	8649349		0.0011	0.0012	NA	< 0.0005				106%	90%	110%			
Phosphorus Dissolved	8647935		0.06	0.06	NA	< 0.05				100%	90%	110%			
Lead Dissolved	8649349		<0.0005	<0.0005	NA	< 0.0005				99%	90%	110%			
Sulphur Dissolved	8647935		10.5	10.6	0.7%	< 0.5				105%	90%	110%			
Antimony Dissolved	8649349		0.0001	0.0001	NA	< 0.0001				106%	90%	110%			
Selenium Dissolved	8649349		<0.0005	<0.0005	NA	< 0.0005				107%	90%	110%			
Silicon Dissolved	8647935		2.86	2.90	1.2%	< 0.05				107%	90%	110%			
Tin Dissolved	8649349		<0.0005	<0.0005	NA	< 0.0005				96%	90%	110%			
Strontium Dissolved	8649349		0.203	0.194	4.6%	< 0.0002				96%	90%	110%			
Tellurium Dissolved	8649349		<0.0002	<0.0002	NA	< 0.0002				98%	90%	110%			
Thorium Dissolved	8649349		<0.0001	<0.0001	NA	< 0.0001				99%	90%	110%			
Titanium Dissolved	8649349		<0.0005	0.0005	NA	< 0.0005				101%	90%	110%			
Thallium Dissolved	8649349		<0.00005	<0.00005	NA	< 0.00005				95%	90%	110%			
Uranium Dissolved	8649349		0.00049	0.00050	2.2%	< 0.00005				94%	90%	110%			
Vanadium Dissolved	8649349		<0.001	<0.001	NA	< 0.001				101%	90%	110%			
Tungsten Dissolved	8649349		<0.0001	<0.0001	NA	< 0.0001				97%	90%	110%			
Zinc Dissolved	8649349		<0.001	<0.001	NA	< 0.001				101%	90%	110%			
Zirconium Dissolved	8649349		0.0001	0.0002	NA	< 0.0001				94%	90%	110%			

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Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17F246688

PROJECT: 1657709/5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date:			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

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Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17F246688

PROJECT: 1657709/5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Weight of Dry Sample			ICP-MS
Volume of DI Water			PH METER
Silver Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Aluminum Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Arsenic Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Boron Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Barium Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Beryllium Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Bismuth Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Calcium Dissolved	ARD-181-18006, MET-181-6108	MEND Report 1.20.1 (2009), Modified from SM 3120 B	ICP/OES
Cadmium Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Cobalt Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Chromium Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Copper Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Iron Dissolved	ARD-181-18006, MET-181-6108	MEND Report 1.20.1 (2009), Modified from SM 3120 B	ICP/OES
Mercury Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Potassium Dissolved	ARD-181-18006, MET-181-6108	MEND Report 1.20.1 (2009), Modified from SM 3120 B	ICP/OES
Lithium Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Magnesium Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Manganese Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Molybdenum Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Sodium Dissolved	ARD-181-18006, MET-181-6108	MEND Report 1.20.1 (2009), Modified from SM 3120 B	ICP/OES
Nickel Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Phosphorus Dissolved	ARD-181-18006, MET-181-6108	MEND Report 1.20.1 (2009), Modified from SM 3120 B	ICP/OES
Lead Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Sulphur Dissolved	ARD-181-18006, MET-181-6108	MEND Report 1.20.1 (2009), Modified from SM 3120 B	ICP/OES
Antimony Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Selenium Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS

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Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

AGAT WORK ORDER: 17F246688

PROJECT: 1657709/5000

ATTENTION TO: Erin O'Brien

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Silicon Dissolved	ARD-181-18006, MET-181-6108	MEND Report 1.20.1 (2009), Modified from SM 3120 B	ICP/OES
Tin Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Strontium Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Tellurium Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Thorium Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Titanium Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Thallium Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Uranium Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Vanadium Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Tungsten Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Zinc Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS
Zirconium Dissolved	ARD-181-18006, MET-181-6107	MEND Report 1.20.1 (2009), Modified from SM 3125 B	ICP-MS

AGAT Laboratories

Acid Rock Drainage Chain Of Custody Form (for solid samples, extracts & leachates)

Address: 120 - 8600 Glenlyon Parkway, Burnaby, BC V5J 0B6 Web E-Mail: webearth agatlabs com

Phone: 778 452 4000; Fax: 778 452 4074

Contact Person: Andrew Garrard; E-Mail: garrard@agatlabs com

Laboratory Use Only

Arrival Condition:	X	Good		Poor
AGAT Work Order #:	17F246638			
Date Samples Rec'd:	August 4, 2017			

Company:	GOLDER ASSOCIATES	Report To:	
Contact Person:	ERIN O'BRIEN	1	ERIN O'BRIEN
Address:	#200- 2920 VIRTUAL WAY	2	A.KAUL
	VANCOUVER, BC V5M 0C4	3	
Telephone:	604-296-4200 Fax: 604-298-5253	4	
Client Project Name:	K-19	E-Mail:	
Client Project #:	1657709/5000	1	Erin_O'Brien@golder.com
AGAT ARD Project #:		2	akaul@golder.com
AGAT ARD Quote #:		3	
		4	

Report Format Request: [ ] Excel Format; [ ] PDF Format; [X] Both

TAT Request: [X] Regular TAT; [ ] Rush TAT

Client Notes:

COC No.: 1 of

DUE DATE: August 28, 2017

Notes:

Courier information(if available):

Print Name:

Date:

Storage Policy: All solid samples will be stored free for 90 days and all extracts in cold room for 60 days and then discarded or returned. Clients must inform AGAT if longer storage is required. A storage fee will apply.

Analysis Request

S. No.	Client Sample ID (Solids Matrix)	AGAT Sample ID	Sample Prep (Dry <1kg, split 120g and pulverize to 85% passing 200 mesh (75 um))	Modified ABA Package (96-97 Method) (Paste pH, Fizz test, NP & Total S)	Standard Sobek ABA Package (Paste pH, Fizz test, NP & Total S)	Siderite Corrected NP	Sulphate Sulphur- HCl Leach (sulphide sulphur by difference)	Sulphate Sulphur- Na2CO3 Leach	Sulphate Sulphur- Gravimetric Method	Sulphur Spec. (Sulphate-S, Sulphide-S & Non-Extractable-S; ASTM 2492-02 method)	Total Carbon	Total Organic Carbon	Carbonate Carbon (CO2; HCl method)	Surface Rinse pH on <2mm fraction (MEND method)	Crushed pH (MEND method) □ on Pulp □ <1/4" fraction	Single Addition NAG □ Egi method (181-712) □ MEND method (181-711)	NAG Extract Analysis	Trace Metals by Aqua Regia Digestion □ ICP-OES (201073) □ ICP-MS (201074)	Total Metals by 4 Acid Digestion □ ICP-OES (201070) □ ICP-MS (201071)	Whole Rock Analysis □ ICP-OES (201076) □ XRF (201676)	Shakeflask Extraction (SFE; MEND method; water extraction)	Synthetic Precipitation Leaching Procedure (SPLP; US-EPA 1312 method; water extr.)	Meteoric Water Mobility Procedure (MWMP; EP 1990/STD Method; water extr.)	Mineralogy: Optical Microscopy on polished thin sections	Mineralogy: Rietveld XRD	Humidity Cell Testing by MEND Method	Humidity Cell Testing by ASTM Method	Particle Size Analysis (Dry Sieve Method using RO-TAP)	Particle Size Distribution (Wet Sieve Method using Hydrometer)	Custom Column Testing	Custom Sub-Aqueous Disposal (SAD) Column Testing
	Burnaby Code		181-033	181-704	181-703	181-705	181-706	181-707		181-708	181-709	181-710	201-037	181-701	181-702	181-712/713		201-074	201-071	201-076/676	181-714	181-715	181/716	181-999	185-999	181-740	181-741	181-718	58-540	181-999	181-998
1	05377-01	8620790	X	X			X											X			X											
2	05377-02	8620791	X	X			X											X			X											
3	05377-03	8620792	X	X			X											X			X											

S. No.	Extract & Leachate Analyses Request		pH	EC	ORP	Acidity	Alkalinity (total/speciation)	Sulphate	Turbidity	Chemical Oxygen Demand (COD)	Biochemical Oxygen Demand (BOD)	TDS	TSS	Nitrate	Nitrite	Nitrate + Nitrite as N (one result)	TKN	Nitrogen, Total	Ammonia, Total	Flouride	Chloride	Total Organic Carbon (TOC)	Total Cyanide (SAD)	WAD Cyanide	Oil & Grease (Total)	Oil & Grease (Mineral)	Total Metals by ICP-MS/ICP-OES Scans	Dissolved Metals by ICP-MS/ICP-OES Scan	Hg by CVAA method □ Total □ Dissolved	Dissolved Oxygen	
	Burnaby Code		181-744	181-745	181-746	181-748	181-749	181-747						181-412	181-412	181-698		181-655		181-750	181-751						181-752	181-752	181-125		
	Method Blank	8620794																										X			
	05377-01	795																										X			
	05377-02	797																										X			
	05377-03	798																										X			

Notes: Total S, Total C & Total Organic C is done by combustion IR.

Maggie Chan

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

No. 05377 page 1 of 1

Golder Associates
200 – 2920 Virtual Way
Vancouver, British Columbia, Canada V5M 0C4
Telephone (604) 296-4200 Fax (604) 298-5253

Project Number: 1657709/5000		Laboratory Name: AGAT	17F246688
Short Title: K19	Golder Contact: Erin O'Brien	Address: Fort St John	
Golder E-mail Address 1: FOBrien @golder.com	Golder E-mail Address 2: AKaul @golder.com	Telephone/Fax:	Contact: Dave Osgulthorpe

Office Name: Vancouver

EQuIS Facility Code: 28433859
EQuIS upload: ☐

PNGSC Contact for HUB 4 PHASE 1 DRILLING

Turnaround Time: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Regular (5 Days)
Criteria: ☐ CSR ☐ CCME ☐ BC Water Quality ☐ Other

Note: Final Reports to be issued by e-mail

Quote No.:

Analyses Required

Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D / M / Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	Lab ID	RUSH (Select TAT above)	Remarks (over)
05377 - 01	SAMPLE A	1		ROCK	02/08/17		GRAB		05378-01	1	8620790		COC # 05378 associated with some samples sent to Golder Please put to Dave Osgulthorpe
05377 - 02	SAMPLE B	2		ROCK	02/08/17		GRAB		05378-02	1	791		
05377 - 03	SAMPLE C	3		ROCK	02/08/17		GRAB		05378-03	1	792		
- 04													
- 05													
- 06													
- 07													
- 08													
- 09													
- 10													
- 11													
- 12													

Sampler's Signature:	Relinquished by: Signature	Company GOLDER	Date 02/08/17	Time 17:18	Received by: Signature Kyle Nelson	Company
Comments:	Method of Shipment:	Waybill No.:	Received for Lab by:		Date	Time
	Shipped by:	Shipment Condition: Seal Intact:	Temp (°C)	Cooler opened by:	Date	

V111359

WHITE: Golder Copy YELLOW: Lab Copy

13°C RAJ

ESED

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM - BURNABY

Work Order # 17F246688

RECEIVING BASICS:

Received From: NOVEX Waybill #: _____

SAMPLE QUANTITIES:

Coolers: 1 Containers: 3

TIME SENSITIVE ISSUES:

Earliest Date Sampled: 02 Aug 17 ALREADY EXCEEDED? Yes (No)

NON-CONFORMANCES:

3 temperatures of samples* and average of each cooler: (record differing temperatures on the CoC next to sample ID's) ***use jars when available**

(1) 13 + 13 + 14 = 13 °C (2) ___ + ___ + ___ = ___ °C (3) ___ + ___ + ___ = ___ °C (4) ___ + ___ + ___ = ___ °C

Was ice or ice pack present: Yes (No)

Integrity Issues:

Account Project Manager: _____ have they been notified of the above issues: Yes No

Whom spoken to: _____ Date and Time: _____

ADDITIONAL NOTES:

APPENDIX J

Soil Vapour Modeling

SOIL VAPOUR MODELLING METHODOLOGY AND RESULTS

Prior to mobilizing to the field in July 2017, soil vapour partition modelling was conducted within existing APECs, as a preliminary screening tool to determine if any APECs had predicted vapour concentrations that would exceed outdoor air standards and require the installation of soil vapour probes. Soil and groundwater locations within AECs were not considered during the modeling because of the remedial plan to excavate soil contaminated with petroleum hydrocarbons.

Following the July 2017 field investigation, soil vapour partition modelling was completed for detectable concentrations of volatile petroleum hydrocarbons in soil and/or groundwater and had a corresponding vapour standard, as per the *Contaminated Sites Regulation Technical Guidance # 4* (MoE 2017a) and Protocol 22 (MoE 2017b), to estimate soil vapour concentrations.

The output generated showing all the petroleum hydrocarbon parameters with detectable concentrations for soil and groundwater are presented in Tables J-1 and J-2 in Appendix J.

Due to the large amount of soil and groundwater data, screening level soil and groundwater standards were calculated based the soil vapour standards. To create the screening level soil and groundwater standards, it was conservatively assumed that the soil and groundwater samples were collected at less than 1 m below ground surface (Table J-3 and J-4). Locations that failed this initial screening warranted further assessment and the modelling was refined with the correct depths applied for soil and groundwater (Tables J-5 and J-6, respectively). The output provided in Tables 5 and 6 was not able to model the VPHv concentrations, as it is assumed to be equal to the sum of soil vapour partitioning calculations from LEPH and VPH concentrations in soil. Table J-7 and J-8 presents a separate output for VPHv for soil and groundwater.

For the sample locations that contained predicted soil vapour concentrations that would exceed the applicable standards in Tables J-3 to J-8, it was verified whether there were any detectible of vapour substance concentrations within a lateral distance of 30 m (or 10 m for aerobically degradable substances), as per *Technical Guidance #4*. If the closest detectable vapour substance concentration was greater than 30 m and/or 10 m lateral distance, no vapour modelling was required. If another detectable concentration occurred within 30 m, vapour modeling was carried out. The results for soil are presented in Table J-9 where a total of 32 locations were modelled. One location (K19a-09MW-05) could potentially exceed the applicable CSR RL vapour standards for benzene using applicable attenuation factors for outdoor air. Fractured bedrock is considered a preferential pathway. If bedrock was identified in the borehole logs, then the attenuation factor was based on the depth to bedrock, rather than the depth of the collected sample if the sample was collected from bedrock. No soil vapour modelling for groundwater was required as none of the locations exceeded standards when the conservative assumptions were applied.

There are currently five residential dwellings which were recently constructed on neighboring properties near the Site. A site visit was completed to identify the distance of these structures to the Site boundary. One of these structures occurs within 30 m of the Site boundary, and two sampling locations (K19-MW16-07D and K19-MW16-07S) occur within 30 m of the neighboring structure. The soil vapour concentrations for location K19-MW16-07 were modelled and are presented in Table J-10. Groundwater standards were generated based on the soil vapour standards and the results are presented in Table J-11. Table J-12 displays the chemistry data against the generated standards for groundwater. The output in Table 12 was not able to correctly model the

VPHv concentration and is presented separately in Table J-13. The soil vapour partition modelling completed on K19-MW16-07S/D suggests that the vapour concentrations could exceed the applicable CSR RL vapour standards for several parameters for indoor air when using attenuation factors based on the assumption that the neighboring residential dwellings would have an unlined crawlspace, earthen basement or wooden basement.

References

BC MoE. 2017(a). *Technical Guidance on Contaminated Sites – Vapour Investigation and Remediation*. [Technical Guidance 4, Version 2, 1 November 2017]. Victoria, BC.

BC MoE. 2017(b). Protocol 22 on Contaminated Sites – *Application of Vapour Attenuation Factors to Characterize Vapour Contamination* [Protocol 22, Version 1, 1 November 2017]. Victoria, BC.

o:\final\2016\3 proj\1657709 pwgsc_remediation_akhwy\ph 5000\1657709-045-r-reva\app\app j - soil vapour modeling\app j sv modelling.docx

Table J-1: Soil Petroleum Hydrocarbon Detections -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit																								
Location		K19-10TP-03	K19-10TP-05	K19-10TP-09	K19-10TP-09	K19-10TP-11	K19-10TP-12	K19-10TP-13	K19-10TP-17	K19-10TP-17	K19-10TP-18	K19-10TP-21	K19-10TP-22	K19-10TP-23	K19-10TP-24	K19-10TP-30	K19-10TP-31	K19-10TP-35	K19-10TP-35	K19-10TP-36	K19-10TP-38	K19-10TP-39	K19-10TP-41	K19-10TP-42
Sample Name		K19-10TP-03-3	K19-10TP-05-2	K19-10TP-09-3	K19-10TP-09-5	K19-10TP-11-2	K19-10TP-12-4	K19-10TP-13-3	K19-10TP-17-5	K19-10TP-DUP-2	K19-10TP-18-2	K19-10TP-21-2	K19-10TP-22-6	K19-10TP-23-5	K19-10TP-24-6	K19-10TP-30-5	K19-10TP-31-6	K19-10TP-35-1	K19-10TP-DUP-3	K19-10TP-36-1	K19-10TP-38-1	K19-10TP39-4	K19-10TP-41-4	K19-10TP-42-6
Sample Date		8/5/2010	8/5/2010	8/5/2010	8/5/2010	8/5/2010	8/6/2010	8/6/2010	8/6/2010	8/6/2010	8/6/2010	8/7/2010	8/7/2010	8/7/2010	8/7/2010	8/8/2010	8/8/2010	8/8/2010	8/8/2010	8/8/2010	8/8/2010	8/9/2010	8/9/2010	8/9/2010
Sample Depth		0.3-0.91 m	0.3-0.91 m	0.91-1.22 m	1.83-2.13 m	0.3-0.6 m	2.15-2.45 m	1.2-1.5 m	2.75-3.05 m	2.75-3.05 m	0.9-1.2 m	0.6-0.9 m	2.75-3.05 m	2.15-2.45 m	3.35-3.65 m	2.75-3 m	3.65-3.95 m	0-0.3 m	0-0.3 m	0-0.3 m	0.3-0.6 m	2.15-2.45 m	2.15-2.45 m	2.75-3.05 m
SYS_SAMPLE_CODE		W04971	W04969	W04965	W04966	W04963	W07745	W07744	W07743	W07746	W07742	W07747	W07748	W07749	W07750	W07751	W07752	W07753	W07866	W07865	W07867	W10033	W10034	W10035
PARENT_SAMPLE_CODE										W07743									W07753					
SAMPLE_TYPE_CODE		N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	FD	N	N	N	N	N
FIELD_SDG		B068158	B068158	B068158	B068158	B068158	B068605	B068605	B068605	B068605	B068605	B068605	B068605	B068605	B068605	B068605	B068605	B068605	B068605	B068605	B068605	B069119	B069119	B069119
PAH																								
Acenaphthene	mg/kg	-	-	-	-	-	3.1	-	-	-	-	-	-	0.41	0.20	-	-	-	-	-	-	-	-	-
Acenaphthylene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.014	-	-	-
Benzo(a)anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	0.019	-	-	-	0.011	-	-	-	0.0010	0.0024	0.0012	-
Benzo(a)pyrene	mg/kg	-	-	-	-	-	-	0.0022	-	-	0.0017	-	0.024	-	0.011	-	0.012	-	-	-	-	0.0025	-	-
Benzo(b)fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	-	-	-	0.047	0.056	0.035	0.023	-	-	0.026	-	0.17	0.057	0.11	-	0.13	0.0064	0.0044	0.010	0.0086	0.031	0.013	-
Benzo(k)fluoranthene	mg/kg	-	-	-	-	-	-	0.0015	-	-	0.0032	-	0.016	0.044	0.012	-	0.011	0.0012	0.0012	0.0017	-	0.0020	0.0019	-
Chrysene	mg/kg	-	-	-	0.012	0.013	0.042	0.026	-	-	0.025	-	0.14	0.047	0.077	-	0.11	0.0066	0.0054	0.014	0.015	0.0063	0.020	-
Dibenzo(a,h)anthracene	mg/kg	-	-	-	-	-	-	0.0034	-	-	0.0047	-	0.020	-	-	-	0.014	-	-	-	-	0.0063	0.0023	-
Fluoranthene	mg/kg	-	-	-	-	-	0.020	0.0035	-	-	0.0041	-	0.045	0.010	0.015	-	0.030	0.0013	0.0013	0.0024	0.0026	0.0056	0.0036	-
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j) fluoranthene	mg/kg	-	-	-	0.038	0.045	0.024	0.017	-	-	0.024	-	0.068	0.042	0.058	-	0.062	0.0068	0.0058	0.017	0.016	0.028	0.017	-
Fluorene	mg/kg	-	0.14	-	0.21	-	5.9	0.0054	-	-	-	-	0.22	1.1	0.60	-	0.093	-	-	-	-	0.0013	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg	-	-	-	-	-	-	-	-	-	0.0037	-	0.022	-	-	-	0.014	-	-	-	-	0.0061	0.0024	-
Naphthalene	mg/kg	-	-	-	1.0	0.27	29	-	-	-	0.48	-	1.2	16	5.3	-	0.17	0.0048	0.0021	0.0056	0.0056	0.010	0.0060	-
Phenanthrene	mg/kg	-	-	-	0.28	0.084	2.0	0.049	-	-	0.027	-	0.61	0.83	0.48	-	0.22	0.0080	0.0065	0.0097	0.013	0.022	0.014	-
Pyrene	mg/kg	-	0.090	-	0.027	0.015	0.047	0.0076	-	-	0.0060	-	0.072	0.020	0.032	-	0.039	0.0024	0.0021	0.0031	0.0032	0.0059	0.0044	-
2-methylnaphthalene	mg/kg	-	-	-	0.70	0.29	120	0.16	-	-	0.18	-	3.5	15	11	-	0.31	0.0060	0.0039	0.0075	0.0075	0.010	0.0075	-
PAH, Low Molecular Weight	mg/kg	-	-	-	2.2	0.64	160	-	-	-	0.69	-	5.5	33	17	-	0.79	0.019	0.013	0.023	0.040	0.044	0.028	-
PAH, High Molecular Weight	mg/kg	-	0.090	-	0.12	0.13	0.17	0.083	-	-	0.099	-	0.60	0.22	0.32	-	0.44	0.025	0.020	0.048	0.047	0.097	0.066	-
PAH, Total	mg/kg	-	-	-	2.3	0.77	160	-	-	-	0.78	-	6.1	33	18	-	1.2	0.044	0.033	0.071	0.087	0.14	0.094	-
EPH (C10-C19)	mg/kg	-	10900	-	892	-	14200	277	-	-	184	-	1190	7570	3020	-	497	-	-	-	-	-	-	-
LEPH (C10-C19) Less PAHs	mg/kg	-	10900	-	891	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	mg/kg	-	1090	-	-	-	310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HEPH (C19-C32) Less PAHs	mg/kg	-	1090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH (C6-C10)	mg/kg	35	-	-	-	-	-	-	620	690	-	-	-	-	-	-	-	-	-	-	-	-	-	520
VHC (C6-C10)	mg/kg	34	-	-	-	-	-	-	650	730	-	-	-	-	-	-	-	-	-	-	-	-	-	530
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg	-	-	-	-	-	-	-	700	790	-	-	-	-	-	-	-	-	-	-	-	-	-	550
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg	-	-	-	-	-	-	-	730	820	-	-	-	-	-	-	-	-	-	-	-	-	-	570
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																								
Bromodichloromethane (BDCM)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg	-	-	-	-	-	-	-	1.7	2.3	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3
Toluene	mg/kg	-	-	-	-	-	-	-	2.3	3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	-	-	-	-	-	-	-	8.7	9.6	-	-	-	-	-	-	-	-	-	-	-	-	-	4.3
Xylenes, Total	mg/kg	-	-	-	-	-	-	-	14	16	-	-	-	-	-	-	-	-	-	-	-	-	-	7.9
o-Xylene	mg/kg	-	-	-	-	-	-	-	0.96	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg	-	-	-	-	-	-	-	13	15	-	-	-	-	-	-	-	-	-	-	-	-	-	7.9
1,2,3-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit	Location	K19-10TP-43	K19-16-22	K19-BH17-03	K19-BH17-03	K19-BH17-03	K19-BH17-03	K19-BH17-08	K19-BH17-08	K19-BH17-09	K19-BH17-09	K19-BH17-09	K19-BH17-09	K19-BH17-15	K19-BH17-15	K19-BH17-15	K19-BH17-16	K19-BH17-16	K19-BH17-16	K19-MW16-01S	K19-MW16-01S	K19-MW16-01S	K19-MW16-02	K19-MW16-02
		Sample Name	K19-10TP-43-2	01481-04	06696-08	06696-11	06696-12	06697-01	06700-07	06700-10	06700-11	06701-01	06701-02	06701-04	06705-01	06705-03	06705-04	06705-09	06705-10	06705-11	K19-MW16-01S/SA1	K19-MW16-01S/SA3	K19-MW16-01S/SA4	K19-MW16-02/SA1	K19-MW16-02/SA2
		Sample Date	8/9/2010	8/30/2016	1/31/2017	1/31/2017	1/31/2017	1/31/2017	2/4/2017	2/4/2017	2/4/2017	2/4/2017	2/4/2017	2/4/2017	2/7/2017	2/7/2017	2/7/2017	2/7/2017	2/7/2017	2/7/2017	3/7/2016	3/8/2016	3/8/2016	3/8/2016	3/8/2016
		Sample Depth	0.6-0.9 m	2-2 m	0.5-0.5 m	3.5-3.5 m	4-4 m	4.5-4.5 m	2.5-2.5 m	5.2-5.2 m	0.5-0.5 m	2.5-2.5 m	2.5-2.5 m	4.3-4.3 m	1.4-1.4 m	3.5-3.5 m	4.3-4.3 m	3.5-3.5 m	4.2-4.2 m	4.2-4.2 m	2-2 m	0-1 m	1-3 m	0.76-1.1 m	2-2 m
		SYS_SAMPLE_CODE	W10038	PK6755	QN1619	QN1622	QN1623	QN1624	QN6520	QN6523	QN6524	QN6526	QN6527	QN6529	QN9086	QN9088	QN9089	QN9094	QN9095	QN9096	OG9364	OG9431	OG9432	OG9366	OG9367
		PARENT_SAMPLE_CODE											QN6526							QN9095					
		SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	FD	N	N	N	N	N
		FIELD_SDG	B069119	B675549	B709132	B709132	B709132	B709132	B710078	B710078	B710078	B710078	B710078	B710078	B710365	B710365	B710365	B710365	B710365	B710365	B619198	B619209	B619209	B619198	B619198
PAH																									
Acenaphthene	mg/kg		-	-	-	0.025	-	-	-	0.041	-	0.056	0.037	0.040	-	-	0.036	0.041	0.047	0.033	-	-	-	-	0.35
Acenaphthylene	mg/kg		-	-	-	-	-	-	-	-	-	-	0.0065	-	-	-	-	-	0.0062	0.0062	-	-	-	-	-
Anthracene	mg/kg		-	-	-	-	-	-	-	0.018	-	0.0096	0.0067	0.015	-	-	0.013	0.0045	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg		0.0034	-	-	-	-	-	-	-	-	-	0.020	0.021	-	-	-	0.024	0.023	0.021	-	-	-	-	-
Benzo(a)pyrene	mg/kg		0.0048	-	-	0.030	-	-	-	0.033	-	0.022	0.023	0.037	-	-	0.031	0.046	0.041	0.043	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg		-	0.056	-	0.061	-	-	0.046	0.052	-	0.072	0.083	0.057	-	-	0.050	0.068	0.075	0.075	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg		0.069	0.092	-	0.16	-	-	-	0.15	-	0.14	0.17	0.17	-	-	0.14	0.24	0.23	0.23	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg		0.0023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg		0.018	0.026	-	0.043	-	-	0.060	0.032	-	0.057	0.085	0.041	-	-	0.029	0.082	0.054	0.051	0.023	-	-	-	0.048
Dibenzo(a,h)anthracene	mg/kg		0.011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg		0.0090	-	-	0.048	-	-	-	0.054	-	0.063	0.065	0.057	-	-	0.051	0.066	0.068	0.065	-	-	-	-	-
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg		-	0.046	-	0.068	-	-	0.045	0.070	-	0.061	0.065	0.076	-	-	0.067	0.087	0.082	0.084	-	-	-	-	-
Benzo(b,j) fluoranthene	mg/kg		0.042	0.056	-	0.061	-	-	0.046	0.052	-	0.072	0.083	0.057	-	-	0.050	0.068	0.075	0.075	0.023	-	-	-	0.036
Fluorene	mg/kg		-	-	-	0.11	-	-	-	0.20	-	0.11	0.11	0.20	-	-	0.18	0.21	0.24	0.22	-	-	-	-	1.1
Indeno(1,2,3-c,d)pyrene	mg/kg		0.0099	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg		0.026	-	-	0.53	-	-	-	0.93	-	0.15	0.38	0.59	-	-	0.85	0.57	0.84	0.73	-	-	-	-	5.5
Phenanthrene	mg/kg		0.093	0.033	-	0.37	-	-	0.033	0.47	-	0.39	0.43	0.48	-	-	0.43	0.49	0.54	0.50	0.034	-	-	-	0.87
Pyrene	mg/kg		0.011	0.046	-	0.072	-	-	-	0.088	-	0.081	0.078	0.093	-	-	0.084	0.11	0.12	0.11	-	-	-	-	0.025
2-methylnaphthalene	mg/kg		0.052	-	-	0.94	-	-	-	1.4	-	0.52	0.85	1.2	-	-	1.3	1.3	1.6	1.5	-	-	-	-	14
PAH, Low Molecular Weight	mg/kg		0.17	-	-	2.0	-	-	-	3.1	-	1.2	1.8	2.5	-	-	2.8	2.6	3.3	3.0	-	-	-	-	22
PAH, High Molecular Weight	mg/kg		0.18	0.22	-	0.42	-	-	0.11	0.41	-	0.44	0.52	0.48	-	-	0.38	0.63	0.62	0.60	-	-	-	-	0.11
PAH, Total	mg/kg		0.35	0.25	-	2.4	-	-	0.14	3.5	-	1.7	2.3	3.0	-	-	3.2	3.2	3.9	3.6	0.080	-	-	-	22
EPH (C10-C19)	mg/kg		-	160	-	-	-	-	-	-	-	290	240	-	-	-	-	-	110	-	-	-	-	-	4890
LEPH (C10-C19) Less PAHs	mg/kg		-	160	-	-	-	-	-	-	-	290	240	-	-	-	-	-	110	-	-	-	-	-	4890
EPH (C19-C32)	mg/kg		-	290	-	-	-	-	-	-	-	-	100	-	-	-	-	110	110	-	-	-	-	-	291
HEPH (C19-C32) Less PAHs	mg/kg		-	290	-	-	-	-	-	-	-	-	100	-	-	-	-	110	110	-	-	-	-	-	291
VPH (C6-C10)	mg/kg		-	-	-	-	44	-	-	49	-	15	14	-	-	28	-	25	-	-	-	-	-	-	270
VHC (C6-C10)	mg/kg		-	-	-	-	46	-	-	51	-	15	14	-	-	29	-	25	-	-	-	-	-	-	270
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg		-	-	-	-	53	-	-	53	-	16	17	-	-	30	-	24	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg		-	-	-	-	55	-	-	55	-	16	17	-	-	30	-	25	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																									
Bromodichloromethane (BDCM)	mg/kg		-	-	-	-	0.13	-	-	0.10	-	-	-	-	-	0.081	-	0.079	-	-	-	-	-	-	-
Chlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg		-	-	-	-	0.044	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	0.0055	-	-	-	-	-	-	-	-	0.071
Toluene	mg/kg		-	-	-	-	0.038	-	-	0.099	-	-	0.15	-	-	0.031	-	0.034	-	-	-	-	-	-	-
Ethylbenzene	mg/kg		-	-	-	-	0.33	-	-	0.38	-	0.11	0.052	-	-	0.12	-	0.077	-	-	0.011	-	-	-	0.80
Xylenes, Total	mg/kg		-	-	-	-	1.5	-	-	1.6	-	0.21	0.083	-	-	0.59	-	0.36	-	-	-	-	-	-	0.63
o-Xylene	mg/kg		-	-	-	-	0.49	-	-	0.50	-	0.057	-	-	-	0.20	-	0.11	-	-	-	-	-	-	-
Styrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg		-	-	-	-	1.1	-	-	1.1	-	0.15	0.083	-	-	0.40	-	0.26	-	-	-	-	-	-	0.63
1,2,3-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit	Location	K19-MW16-02	K19-MW16-03	K19-MW16-03	K19-MW16-03	K19-MW16-04	K19-MW16-04	K19-MW16-04	K19-MW16-04	K19-MW16-05	K19-MW16-05	K19-MW16-05	K19-MW16-06	K19-MW16-06	K19-MW16-07	K19-MW16-07	K19-MW16-07	K19-MW16-08	K19-MW16-08	K19-MW16-08	K19-MW16-08	K19-MW16-09	K19-MW16-09	K19-MW16-09
		Sample Name	K19-MW16-02/SA4	K19-MW16-03/SA1	K19-MW16-03/SA2	K19-MW16-03/SA3	K19-MW16-04/SA1	K19-MW16-04/SA2	K19-MW16-04/SA3	K19-MW16-04/SA4	K19-MW16-05/SA2	K19-MW16-05/SA3	K19-MW16-05/SA4	K19-MW16-06/SA2	K19-MW16-06/SA3	K19-MW16-07/SA1	K19-MW16-07/SA2	K19-MW16-07/SA3	01436-01	01436-02	K19-MW16-08/SA1	K19-MW16-08/SA2	01436-07	K19-MW16-09/SA1	K19-MW16-09/SA2
		Sample Date	3/8/2016	3/8/2016	3/8/2016	3/8/2016	3/9/2016	3/9/2016	3/9/2016	3/9/2016	3/9/2016	3/9/2016	3/9/2016	3/10/2016	3/10/2016	3/10/2016	3/10/2016	3/10/2016	3/11/2016	3/11/2016	3/11/2016	3/11/2016	3/11/2016	3/11/2016	3/11/2016
		Sample Depth	0-0.6 m	0.9-1 m	2-2 m	0.76-2 m	0.76-1.1 m	2-2.6 m	0-2 m	2-2.6 m	3-3 m	1-2 m	2-3 m	2-2 m	0.9-1 m	0.76-1.1 m	2-2 m	0.9-2 m	0-0.9 m	0.9-2 m	1-2 m	2-3 m	0.9-2 m	0.6-0.9 m	2-2 m
		SYS_SAMPLE_CODE	OG9435	OG9369	OG9370	OG9439	OG9371	OG9372	OG9445	OG9446	OG9409	OG9450	OG9451	OG9412	OG9454	OG9413	OG9414	OG9461	OH3654	OH3655	OH3623	OH3624	OH3660	OH3625	OH3626
		PARENT_SAMPLE_CODE																							
		SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
		FIELD_SDG	B619209	B619198	B619198	B619209	B619198	B619198	B619209	B619209	B619203	B619209	B619209	B619203	B619209	B619203	B619203	B619209	B619941	B619941	B619935	B619935	B619941	B619935	B619935
PAH																									
Acenaphthene	mg/kg		-	-	-	-	-	0.085	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.27
Acenaphthylene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.015
Benzo(a)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg		-	-	-	-	-	0.035	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg		-	-	-	-	-	-	-	-	0.065	-	-	0.055	-	-	-	-	-	-	-	0.032	-	-	0.032
Benzo(g,h,i)perylene	mg/kg		-	-	-	-	-	0.19	-	-	0.20	-	-	0.17	-	0.062	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg		-	0.056	0.053	-	0.035	0.15	-	-	0.15	-	-	0.12	-	-	-	-	-	-	-	0.035	-	-	0.057
Dibenzo(a,h)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg		-	-	-	-	-	0.054	-	-	0.051	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j) fluoranthene	mg/kg		-	0.034	0.033	-	0.032	0.065	-	-	0.065	-	-	0.055	-	-	-	-	-	-	-	0.032	-	-	0.032
Fluorene	mg/kg		-	-	-	-	-	0.75	-	-	-	-	-	0.25	-	-	-	-	-	-	-	-	-	-	0.76
Indeno(1,2,3-c,d)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg		-	0.014	0.014	-	-	5.8	-	-	-	-	-	0.86	-	-	-	-	-	-	-	-	-	-	7.3
Phenanthrene	mg/kg		-	0.070	0.068	-	0.033	0.78	-	-	0.26	-	-	0.56	-	-	-	-	-	-	-	0.026	-	-	0.41
Pyrene	mg/kg		-	-	-	-	-	0.11	-	-	0.11	-	-	0.086	-	-	-	-	-	-	-	-	-	-	-
2-methylnaphthalene	mg/kg		-	0.027	0.026	-	-	19	-	-	0.11	-	-	3.1	-	-	-	-	-	-	-	-	-	-	1.3
PAH, Low Molecular Weight	mg/kg		-	0.11	0.11	-	-	26	-	-	0.37	-	-	4.8	-	-	-	-	-	-	-	-	-	-	10
PAH, High Molecular Weight	mg/kg		-	0.090	0.086	-	0.067	0.60	-	-	0.58	-	-	0.43	-	0.062	-	-	-	-	-	0.067	-	-	0.088
PAH, Total	mg/kg		-	0.20	0.19	-	0.10	27	-	-	0.95	-	-	5.2	-	0.062	-	-	-	-	-	0.093	-	-	10
EPH (C10-C19)	mg/kg		-	-	-	-	-	4250	-	-	102	-	-	447	-	-	-	-	-	-	-	-	-	-	4430
LEPH (C10-C19) Less PAHs	mg/kg		-	-	-	-	-	4250	-	-	102	-	-	445	-	-	-	-	-	-	-	-	-	-	4430
EPH (C19-C32)	mg/kg		-	-	103	-	-	291	-	-	123	-	-	136	-	-	-	-	-	-	-	-	-	-	-
HEPH (C19-C32) Less PAHs	mg/kg		-	-	103	-	-	291	-	-	123	-	-	136	-	-	-	-	-	-	-	-	-	-	-
VPH (C6-C10)	mg/kg		-	-	-	-	-	520	-	-	14	-	-	150	-	-	-	-	-	-	-	-	-	-	280
VHC (C6-C10)	mg/kg		-	-	-	-	-	550	-	-	14	-	-	160	-	-	-	-	-	-	-	-	-	-	290
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																									
Bromodichloromethane (BDCM)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg		-	-	-	-	-	3.8	-	-	-	-	-	0.089	-	-	-	-	-	-	-	-	-	-	0.091
Toluene	mg/kg		-	0.027	-	-	-	4.3	-	-	-	-	-	1.2	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg		-	0.012	-	-	-	3.8	-	-	-	-	-	0.98	-	-	-	-	-	-	-	-	-	-	0.56
Xylenes, Total	mg/kg		-	0.042	-	-	-	21	-	-	-	-	-	4.7	-	-	-	-	-	-	-	-	-	-	0.59
o-Xylene	mg/kg		-	-	-	-	-	1.2	-	-	-	-	-	1.5	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg		-	0.042	-	-	-	19	-	-	-	-	-	3.3	-	-	-	-	-	-	-	-	-	-	0.59
1,2,3-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit	Location	K19-MW16-09	K19-MW16-10	K19-MW16-11	K19-MW16-11	K19-MW16-12	K19-MW16-12	K19-MW16-13	K19-MW16-14	K19-MW16-15	K19-MW16-15	K19-MW17-01	K19-MW17-01	K19-MW17-01	K19-MW17-01	K19-MW17-01	K19-MW17-01	K19-MW17-02	K19-MW17-02	K19-MW17-02	K19-MW17-04	K19-MW17-04	K19-MW17-05	K19-MW17-05
		Sample Name	K19-MW16-09/SA2(DUPE)	K19-MW16-10/SA1	01435-01	K19-MW16-11/SA1	01435-03	K19-MW16-12/SA1	K19-MW16-13/SA2	K19-MW16-14/SA2	K19-MW16-15/SA1	K19-MW16-15/SA2	03360-01	03360-02	03360-04	03360-05	03360-08	03360-10	03360-12	06696-01	06696-05	06697-03	06697-06	06697-10	06697-11
		Sample Date	3/11/2016	3/12/2016	3/13/2016	3/13/2016	3/13/2016	3/13/2016	3/14/2016	3/14/2016	3/14/2016	3/14/2016	1/30/2017	1/30/2017	1/30/2017	1/30/2017	1/30/2017	1/30/2017	1/30/2017	1/30/2017	1/30/2017	1/31/2017	2/1/2017	2/1/2017	2/1/2017
		Sample Depth	2-2 m	0.9-1 m	1-2 m	0.9-1 m	0.3-0.9 m	0.76-1 m	1-2 m	2-1.7 m	0.46-1.1 m	2-2 m	0.5-0.5 m	1.5-1.5 m	3.5-3.5 m	3.5-3.5 m	6.5-6.5 m	8.6-8.6 m	1.5-1.5 m	2.5-2.5 m	5.5-5.5 m	1.4-1.4 m	3.3-3.3 m	0.5-0.5 m	1.4-1.4 m
		SYS_SAMPLE_CODE	OH3627	OH3628	OH3666	OH3630	OH3668	OH3632	OH7509	OH7511	OH7512	OH7513	QN1513	QN1514	QN1516	QN1517	QN1520	QN1522	QN1524	QN1612	QN1616	QN1626	QN1629	QN1633	QN1634
		PARENT_SAMPLE_CODE	OH3626													QN1516									
		SAMPLE_TYPE_CODE	FD	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N
		FIELD_SDG	B619935	B619935	B619941	B619935	B619941	B619935	B620735	B620735	B620735	B620735	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132
PAH																									
Acenaphthene	mg/kg		0.091	-	-	-	-	-	-	-	-	-	-	-	0.023	0.028	0.050	0.033	0.0078	0.048	0.031	0.078	0.040	-	-
Acenaphthylene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg		-	-	-	-	-	-	-	-	-	0.030	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg		-	-	-	-	-	-	-	-	0.022	-	-	-	-	-	-	-	-	-	-	-	0.021	-	-
Benzo(a)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.024	0.022	-	-	0.023	-	0.048	-	-
Benzo(b)fluoranthene	mg/kg		0.025	-	-	0.029	-	0.024	-	-	-	-	-	0.021	0.032	0.035	0.049	0.036	0.021	0.022	0.049	0.031	0.067	-	0.031
Benzo(g,h,i)perylene	mg/kg		-	-	-	-	-	-	0.054	-	-	-	-	-	-	-	0.11	0.094	-	-	0.12	-	0.24	-	-
Benzo(k)fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg		0.037	0.023	-	0.026	-	0.029	0.060	0.039	0.042	0.027	-	-	0.021	0.021	0.056	0.039	-	-	0.042	-	0.047	-	-
Dibenzo(a,h)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg		-	-	-	-	-	-	-	-	0.11	-	-	-	-	-	0.032	0.032	-	-	0.024	-	0.055	-	-
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	0.042	0.043	0.043	0.061	0.056	0.042	0.042	0.059	0.043	0.088	-	0.043
Benzo(b,j) fluoranthene	mg/kg		0.025	-	-	0.029	-	0.025	0.032	-	0.023	0.027	-	0.021	0.032	0.035	0.049	0.036	0.021	0.022	0.049	0.031	0.067	-	0.031
Fluorene	mg/kg		0.41	-	-	-	-	-	-	-	-	-	-	-	0.030	0.036	0.17	0.15	-	0.20	0.028	0.046	0.16	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg		3.7	-	-	-	-	-	-	-	0.21	-	-	-	1.3	1.3	0.33	0.49	0.012	0.13	0.021	0.028	0.18	-	-
Phenanthrene	mg/kg		0.23	0.023	-	0.010	-	-	0.055	0.047	-	0.029	-	0.036	0.095	0.11	0.38	0.35	0.044	0.16	0.16	0.094	0.39	-	0.021
Pyrene	mg/kg		-	-	-	-	-	-	-	-	0.11	-	-	-	-	-	0.066	0.053	-	-	0.062	-	0.098	-	-
2-methylnaphthalene	mg/kg		0.60	-	-	-	-	-	0.021	-	-	0.031	-	-	0.76	0.79	0.98	0.98	0.023	0.17	0.052	0.10	0.68	-	-
PAH, Low Molecular Weight	mg/kg		5.0	-	-	-	-	-	0.075	-	-	0.30	-	-	2.2	2.3	1.9	2.0	0.088	0.72	0.30	0.35	1.5	-	-
PAH, High Molecular Weight	mg/kg		0.063	-	-	0.055	-	0.054	0.15	-	0.31	0.054	-	-	0.053	0.056	0.34	0.28	-	-	0.32	-	0.58	-	-
PAH, Total	mg/kg		5.1	-	-	0.065	-	0.054	0.22	0.086	-	0.36	-	0.057	2.2	2.3	2.3	2.3	0.11	0.74	0.62	0.38	2.0	-	0.052
EPH (C10-C19)	mg/kg		2180	-	-	-	-	-	-	-	5380	-	-	-	320	340	-	-	-	390	290	1200	-	-	-
LEPH (C10-C19) Less PAHs	mg/kg		2170	-	-	-	-	-	-	-	5380	-	-	-	320	340	-	-	-	390	290	1200	-	-	-
EPH (C19-C32)	mg/kg		-	-	-	-	-	-	166	-	186	-	-	-	120	140	-	-	-	-	490	-	110	-	-
HEPH (C19-C32) Less PAHs	mg/kg		-	-	-	-	-	-	166	-	186	-	-	-	120	140	-	-	-	-	490	-	110	-	-
VPH (C6-C10)	mg/kg		230	-	-	-	-	-	-	-	31	13	-	32	410	340	26	20	-	-	13	50	27	-	-
VHC (C6-C10)	mg/kg		230	-	-	-	-	-	-	-	31	13	-	33	420	350	26	21	-	-	14	50	27	-	-
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg		-	-	-	-	-	-	-	-	-	-	-	31	250	360	32	22	-	-	17	52	30	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	32	260	380	33	23	-	-	18	52	30	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																									
Bromodichloromethane (BDCM)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	0.095	0.66	0.60	0.056	-	-	-	-	-	0.061	-	-
Chlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	0.066	0.063	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	0.66	0.85	-	-	-	-	0.11	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	0.078	0.094	0.13	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.025	-	-	-
1,1,2-trichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	0.070	0.45	0.38	-	-	-	0.032	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg		0.081	-	-	-	-	-	-	-	-	0.013	-	0.85	1.9	2.7	0.075	0.015	0.035	0.23	0.22	-	-	-	-
Toluene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	0.054	0.35	0.64	0.025	0.71	0.16	0.032	0.21	-	0.27	-	-
Ethylbenzene	mg/kg		0.53	-	-	-	-	-	-	-	-	0.079	-	0.011	4.3	5.1	0.041	0.014	0.21	0.36	0.097	0.013	-	-	-
Xylenes, Total	mg/kg		0.54	-	-	-	-	-	-	-	-	0.062	-	0.054	5.0	6.2	0.057	-	-	0.096	0.41	-	-	-	-
o-Xylene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	0.11	0.12	-	-	-	-	0.11	-	-	-	-
Styrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg		0.54	-	-	-	-	-	-	-	-	0.062	-	0.054	4.9	6.1	0.057	-	-	0.096	0.30	-	-	-	-
1,2,3-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.11	-	-	-
1,2,4-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.091	-	-	-
1-Methylnaphthalene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit	Location	K19-MW17-05	K19-MW17-05	K19-MW17-05	K19-MW17-06	K19-MW17-06	K19-MW17-06	K19-MW17-06	K19-MW17-06	K19-MW17-07	K19-MW17-07	K19-MW17-07	K19-MW17-07	K19-MW17-10	K19-MW17-10	K19-MW17-10	K19-MW17-11	K19-MW17-11	K19-MW17-11	K19-MW17-12	K19-MW17-12	K19-MW17-13	K19-MW17-13	K19-MW17-13
		Sample Name	06697-12	06698-01	06698-02	06698-07	06698-09	06698-10	06698-11	06698-12	06699-07	06699-08	06699-10	06699-12	06701-06	06701-08	06701-10	06702-03	06702-05	06702-07	06702-10	06703-01	06703-07	06703-08	06703-10
		Sample Date	2/1/2017	2/1/2017	2/1/2017	2/2/2017	2/2/2017	2/2/2017	2/2/2017	2/2/2017	2/3/2017	2/3/2017	2/3/2017	2/3/2017	2/4/2017	2/4/2017	2/4/2017	2/5/2017	2/5/2017	2/5/2017	2/5/2017	2/5/2017	2/6/2017	2/6/2017	2/6/2017
		Sample Depth	2.5-2.5 m	3.5-3.5 m	4.7-4.7 m	0.5-0.5 m	2.5-2.5 m	3.5-3.5 m	3.5-3.5 m	4.7-4.7 m	0.5-0.5 m	1.5-1.5 m	3.5-3.5 m	4.7-4.7 m	0.5-0.5 m	2.5-2.5 m	4.7-4.7 m	1.4-1.4 m	3.5-3.5 m	5.5-5.5 m	1.4-1.4 m	3.5-3.5 m	0.5-0.5 m	1.4-1.4 m	3.5-3.5 m
		SYS_SAMPLE_CODE	QN1635	QN6490	QN6491	QN6496	QN6498	QN6499	QN6500	QN6501	QN6508	QN6509	QN6511	QN6513	QN6531	QN6533	QN6535	QN6540	QN6542	QN6544	QN6547	QN6550	QN6556	QN6557	QN6559
		PARENT_SAMPLE_CODE							QN6499																
		SAMPLE_TYPE_CODE	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
		FIELD_SDG	B709132	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078
PAH																									
Acenaphthene	mg/kg		0.094	-	0.038	-	0.0058	0.033	0.028	0.035	-	0.0057	0.049	0.038	-	0.012	0.035	-	0.011	0.059	-	0.048	-	-	0.032
Acenaphthylene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg		-	-	0.016	-	-	0.016	0.0097	0.011	-	-	0.0059	0.013	-	0.0076	0.010	-	0.0043	0.018	-	0.0057	-	-	0.0070
Benzo(a)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.021	-	-	0.021
Benzo(a)pyrene	mg/kg		-	-	0.031	-	-	0.029	0.027	0.029	-	-	-	0.033	-	0.020	0.028	-	0.020	0.038	-	0.042	-	-	0.039
Benzo(b)fluoranthene	mg/kg		0.071	-	0.045	-	0.054	0.047	0.047	0.048	-	0.044	0.048	0.050	-	0.072	0.049	-	0.040	0.062	-	0.059	-	-	0.061
Benzo(g,h,i)perylene	mg/kg		0.088	-	0.12	-	0.058	0.13	0.12	0.14	-	0.070	0.065	0.15	-	0.12	0.13	-	0.10	0.17	-	0.21	-	-	0.20
Benzo(k)fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg		0.042	-	0.055	-	0.054	0.035	0.038	0.042	-	0.021	0.040	0.038	-	0.064	0.029	-	0.032	0.051	-	0.062	-	-	0.073
Dibenzo(a,h)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg		0.044	-	0.051	-	0.031	0.047	0.047	0.048	-	-	0.034	0.054	-	0.064	0.044	-	0.038	0.062	-	0.057	-	-	0.059
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg		0.048	-	0.067	-	0.046	0.065	0.063	0.065	-	0.045	0.045	0.070	-	0.059	0.064	-	0.055	0.075	0.041	0.081	-	-	0.078
Benzo(b,j) fluoranthene	mg/kg		0.071	-	0.045	-	0.054	0.047	0.047	0.048	-	0.044	0.048	0.050	-	0.072	0.049	-	0.040	0.062	-	0.059	-	-	0.061
Fluorene	mg/kg		0.14	-	0.18	-	-	0.16	0.14	0.16	-	-	0.17	0.20	-	-	0.17	-	0.020	0.24	-	0.19	-	-	0.19
Indeno(1,2,3-c,d)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg		0.071	-	0.85	-	0.020	0.52	0.39	0.51	-	-	0.52	0.91	-	0.046	0.74	-	0.017	1.0	-	0.69	-	-	0.51
Phenanthrene	mg/kg		0.27	-	0.47	-	0.12	0.42	0.39	0.42	-	0.057	0.21	0.46	-	0.37	0.40	-	0.15	0.61	0.014	0.47	-	-	0.45
Pyrene	mg/kg		0.060	-	0.085	-	0.035	0.078	0.076	0.080	-	0.020	0.036	0.087	-	0.090	0.075	-	0.083	0.11	-	0.090	-	-	0.089
2-methylnaphthalene	mg/kg		0.20	-	1.4	-	0.022	1.1	0.96	1.1	-	0.021	0.30	1.4	-	0.11	1.2	-	0.071	1.9	-	1.4	-	-	1.2
PAH, Low Molecular Weight	mg/kg		0.78	-	2.9	-	0.17	2.3	1.9	2.2	-	0.084	1.3	3.0	-	0.55	2.6	-	0.28	3.8	-	2.8	-	-	2.4
PAH, High Molecular Weight	mg/kg		0.31	-	0.39	-	0.23	0.37	0.35	0.39	-	0.16	0.22	0.41	-	0.43	0.36	-	0.32	0.50	-	0.54	-	-	0.54
PAH, Total	mg/kg		1.1	-	3.3	-	0.40	2.6	2.3	2.6	-	0.24	1.5	3.4	-	0.98	2.9	-	0.60	4.3	-	3.4	-	-	2.9
EPH (C10-C19)	mg/kg		720	-	-	-	-	-	-	-	-	-	450	-	-	-	-	-	-	110	-	-	-	-	-
LEPH (C10-C19) Less PAHs	mg/kg		710	-	-	-	-	-	-	-	-	-	450	-	-	-	-	-	-	110	-	-	-	-	-
EPH (C19-C32)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	120	-	110	-	-	-
HEPH (C19-C32) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	110	-	110	-	-	-
VPH (C6-C10)	mg/kg		13	38	-	-	-	21	24	-	-	-	27	41	-	10	-	-	-	-	-	44	-	-	29
VHC (C6-C10)	mg/kg		13	39	-	-	-	21	24	-	-	-	28	43	-	10	-	-	-	-	-	44	-	-	29
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg		13	40	-	-	-	22	25	-	-	-	28	44	-	11	-	-	-	-	-	46	-	-	32
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg		14	40	-	-	-	22	25	-	-	-	28	46	-	11	-	-	-	-	-	46	-	-	32
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																									
Bromodichloromethane (BDCM)	mg/kg		-	-	-	-	-	0.058	-	-	-	-	-	0.087	-	-	-	-	-	-	-	0.10	-	-	0.084
Chlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg		-	-	-	-	-	0.031	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg		-	-	-	-	-	-	-	-	-	-	0.012	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg		0.39	0.19	-	-	-	0.30	0.13	-	-	-	0.023	0.18	-	-	-	-	0.060	-	-	0.027	-	-	0.021
Ethylbenzene	mg/kg		0.015	0.11	-	-	-	0.018	0.013	-	-	-	0.29	0.25	-	-	-	-	-	-	-	0.093	-	-	0.055
Xylenes, Total	mg/kg		-	0.50	-	-	-	0.10	0.044	-	-	-	0.087	1.1	-	-	-	-	-	-	-	0.44	-	-	0.27
o-Xylene	mg/kg		-	0.15	-	-	-	0.041	-	-	-	-	-	0.34	-	-	-	-	-	-	-	0.14	-	-	0.087
Styrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg		-	0.35	-	-	-	0.062	0.044	-	-	-	0.087	0.71	-	-	-	-	-	-	-	0.31	-	-	0.18
1,2,3-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit	Location	K19-MW17-13	K19-MW17-14	K19-MW17-14	K19-MW17-14	K19-MW17-14	K19-SS16-01	K19-SS16-02	K19-SS16-03	K19-SS16-04	K19-TP16-01	K19-TP16-01	K19-TP16-02	K19-TP16-02	K19-TP16-03	K19-TP16-03	K19-TP16-04	K19-TP16-04	K19-TP16-05	K19-TP16-05	K19-TP16-06	K19-TP16-06	K19-TP16-07	K19-TP16-07
		Sample Name	06703-12	06704-06	06704-07	06704-08	06704-09	01481-09	01481-10	01481-11	01481-12	K19-TP16-01/SA2	K19-TP16-01/SA3	K19-TP16-02/SA1	K19-TP16-02/SA2	K19-TP16-03/SA1	K19-TP16-03/SA2	K19-TP16-04/SA1	K19-TP16-04/SA2	K19-TP16-05/SA1	K19-TP16-05/SA2	K19-TP16-06/SA1	K19-TP16-06/SA2	K19-TP16-07/SA1	K19-TP16-07/SA2
		Sample Date	2/6/2017	2/7/2017	2/7/2017	2/7/2017	2/7/2017	8/31/2016	8/31/2016	8/31/2016	8/31/2016	3/6/2016	3/6/2016	3/7/2016	3/7/2016	3/7/2016	3/7/2016	3/8/2016	3/8/2016	3/8/2016	3/8/2016	3/8/2016	3/8/2016	3/9/2016	3/9/2016
		Sample Depth	5.5-5.5 m	2.5-2.5 m	2.5-2.5 m	3.5-3.5 m	4.3-4.3 m	0.27-0.27 m	0.34-0.34 m	0.4-0.4 m	0.32-0.32 m	2-2 m	3.6-3.6 m	0.6-0.6 m	1.5-1.5 m	1.5-1.5 m	2.9-2.9 m	1.2-1.2 m	2.2-2.2 m	1.9-1.9 m		1-1 m	2.4-2.4 m	0.8-0.8 m	1.5-1.5 m
		SYS_SAMPLE_CODE	QN6561	QN9105	QN9106	QN9107	QN9108	PK6760	PK6761	PK6762	PK6763	OG9393	OG9394	OG9395	OG9396	OG9397	OG9398	OG9399	OG9400	OG9401	OG9403	OG9375	OG9376	OG9377	OG9378
		PARENT_SAMPLE_CODE			QN9105																				
		SAMPLE_TYPE_CODE	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
		FIELD_SDG	B710078	B710365	B710365	B710365	B710365	B675549	B675549	B675549	B675549	B619198	B619198	B619198	B619198	B619198	B619198	B619198	B619198	B619198	B619198	B619198	B619198	B619198	B619198
PAH																									
Acenaphthene	mg/kg		0.038	0.0076	0.0076	-	0.029	-	-	-	-	0.11	0.21	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg		0.011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg		0.031	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg		0.045	0.025	0.031	-	0.051	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg		0.14	-	-	-	0.11	-	-	-	-	-	0.096	-	-	-	-	-	0.059	-	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg		0.031	-	0.021	-	0.044	-	-	-	-	0.090	0.11	-	0.043	-	0.041	-	0.062	0.034	-	-	0.044	-	0.022
Dibenzo(a,h)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg		0.050	-	-	-	0.023	-	-	-	-	-	0.027	-	-	-	-	-	0.020	-	-	-	-	-	-
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg		0.067	0.042	0.043	-	0.046	0.041	0.041	0.041	0.041	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j) fluoranthene	mg/kg		0.045	0.025	0.031	-	0.051	-	-	-	-	0.047	0.053	-	0.031	-	0.028	-	0.033	0.030	-	-	0.037	-	0.023
Fluorene	mg/kg		0.20	-	-	-	-	-	-	-	-	0.74	0.40	-	-	-	-	-	0.023	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg		1.0	-	0.011	-	0.014	-	-	-	-	2.1	0.96	-	-	-	-	-	-	-	-	-	0.013	-	0.056
Phenanthrene	mg/kg		0.46	0.045	0.065	-	0.13	0.014	0.019	0.016	0.011	0.50	0.22	-	0.038	-	0.049	-	0.13	0.035	-	-	0.044	-	0.030
Pyrene	mg/kg		0.083	-	-	-	0.058	-	-	-	-	0.045	0.065	-	-	-	-	-	0.043	-	-	-	0.020	-	-
2-methylnaphthalene	mg/kg		1.5	-	0.030	-	0.044	-	-	-	-	7.2	3.5	-	-	-	0.021	-	0.027	-	-	-	-	-	0.15
PAH, Low Molecular Weight	mg/kg		3.3	0.053	0.11	-	0.22	-	-	-	-	11	5.3	-	-	-	0.070	-	0.18	-	-	-	0.056	-	0.24
PAH, High Molecular Weight	mg/kg		0.38	-	0.052	-	0.29	-	-	-	-	0.18	0.35	-	0.074	-	0.069	-	0.22	0.064	-	-	0.10	-	-
PAH, Total	mg/kg		3.6	0.078	0.17	-	0.50	-	-	-	-	11	5.6	-	0.11	-	0.14	-	0.40	0.099	-	-	0.16	-	0.29
EPH (C10-C19)	mg/kg		-	-	-	-	210	-	-	-	-	2900	1870	-	-	-	-	-	-	-	-	-	-	-	-
LEPH (C10-C19) Less PAHs	mg/kg		-	-	-	-	210	-	-	-	-	2900	1870	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	mg/kg		-	-	-	-	440	-	-	-	-	231	391	-	-	-	-	-	-	-	-	-	-	-	-
HEPH (C19-C32) Less PAHs	mg/kg		-	-	-	-	440	-	-	-	-	231	391	-	-	-	-	-	-	-	-	-	-	-	-
VPH (C6-C10)	mg/kg		46	-	-	11	-	-	-	-	-	230	720	-	-	-	-	-	12	-	-	-	-	-	-
VHC (C6-C10)	mg/kg		48	-	-	11	-	-	-	-	-	230	720	-	-	-	-	-	12	-	-	-	-	-	10
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg		50	-	-	12	-	-	-	-	-	-	750	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg		52	-	-	12	-	-	-	-	-	-	750	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg		-	-	-	-	-	21	58	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg		-	-	-	-	-	-	46	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13000	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																									
Bromodichloromethane (BDCM)	mg/kg		0.088	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg		-	0.11	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg		-	0.045	0.048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	0.12	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg		-	0.069	0.060	0.25	-	-	-	-	-	0.045	0.14	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg		0.098	0.16	-	0.26	-	-	-	-	-	-	0.30	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg		0.30	-	-	0.020	-	-	-	-	-	0.56	1.7	-	-	-	-	-	-	-	-	-	-	-	0.031
Xylenes, Total	mg/kg		1.3	-	-	0.045	-	-	-	-	-	0.61	2.0	-	-	-	-	-	-	-	-	-	-	-	0.078
o-Xylene	mg/kg		0.40	-	-	-	-	-	-	-	-	-	0.53	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg		0.86	-	-	0.045	-	-	-	-	-	0.61	1.5	-	-	-	-	-	-	-	-	-	-	-	0.078
1,2,3-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit	Location	K19-TP16-07	K19-TP16-08	K19-TP16-08	K19-TP16-08	K19-TP16-09	K19-TP16-09	K19-TP16-09	K19-TP16-10	K19-TP16-10	K19-TP16-11	K19-TP16-11	K19-TP16-11	K19-TP16-12	K19-TP16-12	K19-TP16-12	K19-TP16-13	K19-TP16-13	K19-TP16-13	K19-TP16-14	K19-TP16-14	K19-TP16-14	K19-TP16-14	K19-TP16-15
		Sample Name	K19-TP16-07/SA2-DUP	K19-TP16-08/SA1	K19-TP16-08/SA2	K19-TP16-08/SA4	K19-TP16-09/SA1	K19-TP16-09/SA2	K19-TP16-09/SA3	K19-TP16-10/SA1	K19-TP16-10/SA2	K19-TP16-11/SA1	K19-TP16-11/SA2	K19-TP16-11/SA2 DUP	01463-02	01463-03	01463-04	01463-06	01463-08	01463-09	01463-12	01464-01	01464-04	01464-06	01465-01
		Sample Date	3/9/2016	3/9/2016	3/9/2016	3/9/2016	3/9/2016	3/9/2016	3/9/2016	3/10/2016	3/10/2016	3/10/2016	3/10/2016	3/10/2016	8/29/2016	8/29/2016	8/29/2016	8/29/2016	8/29/2016	8/29/2016	8/29/2016	8/29/2016	8/29/2016	8/29/2016	8/29/2016
		Sample Depth	1.5-1.5 m	0.5-0.5 m	1.2-1.2 m	2.8-2.8 m	0.8-0.8 m	1-1 m	2.8-2.8 m	0.6-0.6 m	1.9-1.9 m	1.1-1.1 m	2-2 m	2-2 m	1.5-1.5 m	2.9-2.9 m	2-2 m	1-1 m	2.2-2.2 m	3.1-3.1 m	0.9-0.9 m	2-2 m	3.6-3.6 m	3.6-3.6 m	2.1-2.1 m
		SYS_SAMPLE_CODE	OG9379	OG9380	OG9381	OG9383	OG9419	OG9420	OG9421	OG9423	OG9424	OG9425	OG9426	OG9427	PK1312	PK1313	PK1314	PK1316	PK1318	PK1319	PK1322	PK1323	PK1326	PK1328	PK5690
		PARENT_SAMPLE_CODE	OG9378											OG9426										PK1326	
		SAMPLE_TYPE_CODE	FD	N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	FD	N
		FIELD_SDG	B619198	B619198	B619198	B619198	B619206	B619206	B619206	B619206	B619206	B619206	B619206	B619206	B674520	B674520	B674520	B674520	B674520	B674520	B674520	B674520	B674520	B674520	B675312
PAH																									
Acenaphthene	mg/kg		-	-	-	-	-	-	0.051	-	-	-	-	-	0.13	0.42	0.64	-	0.035	-	0.058	0.41	-	-	0.14
Acenaphthylene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	0.041	0.11	0.17	-	0.0095	-	0.011	0.082	-	-	-
Anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	0.0050	0.034	0.018	-	-	-	0.013	-	-	-	0.014
Benzo(a)anthracene	mg/kg		-	-	-	-	-	0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg		-	-	-	-	-	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg		-	-	-	-	-	0.13	-	-	-	-	-	-	-	0.034	0.027	-	0.025	-	-	0.021	-	-	0.023
Benzo(g,h,i)perylene	mg/kg		-	-	-	-	-	-	-	-	-	-	0.055	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg		-	-	-	-	-	0.055	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg		0.022	-	-	-	-	0.13	-	-	-	-	0.053	-	-	0.025	-	-	-	-	-	-	-	-	0.033
Dibenzo(a,h)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg		-	-	-	-	-	0.26	-	-	-	-	-	-	-	0.024	0.038	-	-	-	-	-	-	-	-
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	0.041	0.043	0.043	-	0.042	-	0.041	0.042	-	-	0.042
Benzo(b,j) fluoranthene	mg/kg		0.024	-	-	-	-	0.20	-	-	-	-	-	-	-	0.034	0.027	-	0.025	-	-	0.021	-	-	0.023
Fluorene	mg/kg		-	-	-	-	-	-	0.20	-	-	-	-	-	0.29	0.96	1.8	-	0.067	-	0.070	0.69	-	-	0.38
Indeno(1,2,3-c,d)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg		0.053	-	-	-	-	0.075	1.7	-	-	-	-	-	3.2	5.3	9.6	-	0.029	-	0.086	7.1	-	-	0.37
Phenanthrene	mg/kg		0.034	-	-	-	-	0.059	0.10	-	-	-	-	-	0.17	0.66	1.4	-	0.10	-	0.026	0.16	-	-	0.35
Pyrene	mg/kg		-	-	-	-	-	0.28	-	-	-	-	-	-	-	0.030	0.066	-	-	-	0.046	-	-	-	-
2-methylnaphthalene	mg/kg		0.19	-	-	-	-	0.24	5.2	-	-	-	-	-	3.5	6.1	37	-	0.068	-	0.27	25	-	-	0.26
PAH, Low Molecular Weight	mg/kg		0.28	-	-	-	-	0.38	7.2	-	-	-	-	-	7.3	14	52	-	0.31	-	1.0	34	-	-	1.5
PAH, High Molecular Weight	mg/kg		-	-	-	-	-	1.2	-	-	-	-	0.11	-	-	0.11	0.13	-	-	-	-	-	-	-	0.057
PAH, Total	mg/kg		0.33	-	-	-	-	1.6	7.2	-	-	-	0.11	-	7.3	14	52	-	0.33	-	1.1	34	-	-	1.6
EPH (C10-C19)	mg/kg		133	-	-	-	-	404	798	-	-	-	-	-	1700	4200	8900	-	580	-	4300	2900	-	-	1700
LEPH (C10-C19) Less PAHs	mg/kg		133	-	-	-	-	404	797	-	-	-	-	-	1700	4200	8900	-	580	-	4300	2900	-	-	1700
EPH (C19-C32)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	130	280	410	-	-	-	620	110	-	-	150
HEPH (C19-C32) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	130	280	410	-	-	-	620	110	-	-	150
VPH (C6-C10)	mg/kg		11	-	-	-	-	-	69	-	-	-	-	-	110	180	150	-	24	78	200	-	-	-	72
VHC (C6-C10)	mg/kg		11	-	-	-	-	-	71	-	-	-	-	-	110	190	150	-	24	79	200	-	-	-	72
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	120	210	190	-	32	87	240	-	-	10	79
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	120	210	190	-	32	87	240	-	-	10	80
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg		-	-	-	8600	-	-	-	-	-	-	7700	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																									
Bromodichloromethane (BDCM)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	0.031	0.052	0.020	-	-	0.015	-	-	-	-	0.011
Toluene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.025	-	-	-	0.041	-	0.19	0.022	-
Ethylbenzene	mg/kg		0.028	-	-	-	-	-	0.19	-	-	-	-	-	0.29	0.94	0.46	-	0.010	0.095	0.050	-	0.027	0.027	0.30
Xylenes, Total	mg/kg		0.070	-	-	-	-	-	1.5	-	-	-	-	-	0.11	0.36	0.53	-	-	-	0.085	-	-	-	-
o-Xylene	mg/kg		-	-	-	-	-	-	0.32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg		0.070	-	-	-	-	-	1.1	-	-	-	-	-	0.11	0.36	0.53	-	-	-	0.085	-	-	-	-
1,2,3-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit	Location	K19-TP16-15	K19-TP16-15	K19-TP16-16	K19-TP16-16	K19-TP16-16	K19-TP16-17	K19-TP16-17	K19-TP16-18	K19-TP16-18	K19-TP16-18	K19-TP16-18	K19-TP16-19	K19-TP16-19	K19-TP16-20	K19-TP16-20	K19-TP16-20	K19-TP16-20	K19-TP16-21	K19-TP16-24	K19-TP16-24	K19-TP16-24	K19-TP16-25	K19-TP16-25
		Sample Name	01465-02	01465-03	01465-04	01465-06	01465-08	01465-09	01465-10	01466-01	01466-02	01466-03	01466-05	01466-07	01466-08	01466-11	01466-12	01480-02	01480-04	01480-07	01482-01/K19-TP16-24	01482-03	01482-05	01482-08	01482-10
		Sample Date	8/29/2016	8/29/2016	8/29/2016	8/29/2016	8/29/2016	8/30/2016	8/30/2016	8/30/2016	8/30/2016	8/30/2016	8/30/2016	8/30/2016	8/30/2016	8/30/2016	8/30/2016	8/30/2016	8/30/2016	8/30/2016	8/31/2016	8/31/2016	8/31/2016	8/31/2016	8/31/2016
		Sample Depth	3-3 m	3.7-3.7 m	0.5-0.5 m	1-1 m	2-2 m	0.5-0.5 m	1-1 m	0.5-0.5 m	1-1 m	1.5-1.5 m	1.5-1.5 m	0.5-0.5 m	1-1 m	1-1 m	1.5-1.5 m	2.9-2.9 m	3.8-3.8 m	2-2 m	0.5-0.5 m	2.5-2.5 m	2.5-2.5 m	1.6-1.6 m	3.6-3.6 m
		SYS_SAMPLE_CODE	PK5691	PK5692	PK5693	PK5695	PK5697	PK5698	PK5699	PK5722	PK5723	PK5724	PK5725	PK5727	PK5728	PK5731	PK5732	PK5704	PK5706	PK5709	PK6781	PK6783	PK6785	PK6788	PK6790
		PARENT_SAMPLE_CODE											PK5724										PK6783		
		SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	FD	N	N
		FIELD_SDG	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675312	B675549	B675549	B675549	B675549	B675549
PAH																									
Acenaphthene	mg/kg		-	0.017	-	-	0.18	-	0.0066	-	-	-	-	-	0.0086	-	-	0.47	0.18	0.011	-	0.073	0.12	-	0.049
Acenaphthylene	mg/kg		-	-	-	-	0.057	-	-	-	-	-	-	-	-	-	-	0.24	0.035	-	-	0.012	-	-	-
Anthracene	mg/kg		-	-	-	-	0.017	-	-	-	-	-	-	-	-	-	-	0.028	0.0050	-	-	0.0059	-	-	-
Benzo(a)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.023
Benzo(b)fluoranthene	mg/kg		-	0.043	-	-	0.020	-	0.026	-	0.020	-	-	-	0.030	-	-	0.040	0.047	0.023	-	-	-	0.025	0.042
Benzo(g,h,i)perylene	mg/kg		-	0.086	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.075	-	-	-	-	-	0.11
Benzo(k)fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg		-	0.10	-	-	0.026	-	0.030	-	-	-	-	-	0.044	-	-	0.064	0.11	0.031	-	-	-	-	0.10
Dibenzo(a,h)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.024	-	-	-	-	-	0.033
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg		-	0.046	-	0.041	0.042	-	0.043	-	0.042	-	-	-	0.043	-	-	0.044	0.046	0.042	-	0.041	0.041	0.042	0.059
Benzo(b,j) fluoranthene	mg/kg		-	0.043	-	-	0.020	-	0.026	-	0.020	-	-	-	0.030	-	-	0.040	0.047	0.023	-	-	-	0.025	0.042
Fluorene	mg/kg		-	0.040	-	-	0.71	-	-	-	-	-	-	-	-	-	-	0.82	0.36	-	-	0.089	0.061	-	0.14
Indeno(1,2,3-c,d)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg		-	0.017	-	-	3.9	-	-	-	-	-	-	-	-	-	-	3.3	2.1	-	-	0.16	0.067	-	0.19
Phenanthrene	mg/kg		-	0.091	-	0.015	0.53	-	0.037	-	0.017	-	-	-	0.052	-	-	0.64	0.34	0.041	-	0.053	0.046	0.024	0.37
Pyrene	mg/kg		-	0.048	-	-	-	-	-	-	-	-	-	-	-	-	-	0.029	0.054	-	-	0.027	0.023	-	0.068
2-methylnaphthalene	mg/kg		-	0.055	-	-	2.4	-	-	-	-	-	-	-	-	-	-	5.6	2.9	-	-	0.32	0.22	-	0.71
PAH, Low Molecular Weight	mg/kg		-	0.22	-	-	7.8	-	-	-	-	-	-	-	0.061	-	-	11	5.9	0.052	-	0.71	0.51	-	1.5
PAH, High Molecular Weight	mg/kg		-	0.28	-	-	-	-	0.056	-	-	-	-	-	0.075	-	-	0.13	0.31	0.054	-	-	-	-	0.38
PAH, Total	mg/kg		-	0.50	-	-	7.8	-	0.10	-	-	-	-	-	0.14	-	-	11	6.2	0.11	-	0.74	0.54	-	1.8
EPH (C10-C19)	mg/kg		-	370	-	-	5400	-	-	-	-	-	-	-	-	-	-	4100	1800	-	-	2400	1400	-	-
LEPH (C10-C19) Less PAHs	mg/kg		-	370	-	-	5400	-	-	-	-	-	-	-	-	-	-	4100	1800	-	-	2400	1400	-	-
EPH (C19-C32)	mg/kg		-	510	-	-	290	-	-	-	-	-	-	-	-	-	-	260	350	-	-	370	300	-	-
HEPH (C19-C32) Less PAHs	mg/kg		-	510	-	-	290	-	-	-	-	-	-	-	-	-	-	260	350	-	-	370	300	-	-
VPH (C6-C10)	mg/kg		78	-	-	-	80	-	-	-	-	-	-	-	-	-	-	110	260	-	-	73	-	-	26
VHC (C6-C10)	mg/kg		79	-	-	-	80	-	-	-	-	-	-	-	-	-	-	110	260	-	-	73	-	-	26
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg		81	-	-	-	100	-	-	-	-	-	-	-	-	-	-	110	300	-	-	82	-	-	29
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg		81	-	-	-	100	-	-	-	-	-	-	-	-	-	-	110	300	-	-	82	-	-	29
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																									
Bromodichloromethane (BDCM)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg		0.0087	-	-	-	0.0084	-	-	-	-	-	-	-	-	-	-	0.057	0.19	-	-	0.013	-	-	-
Toluene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	0.10	-	-	-	0.23	-	-	0.087	0.039	-	0.064
Ethylbenzene	mg/kg		0.19	-	-	-	0.24	-	-	-	-	-	-	-	-	-	-	0.77	2.3	-	-	0.14	0.075	-	0.011
Xylenes, Total	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.17	2.4	-	-	0.16	0.040	-	-
o-Xylene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.26	-	-	0.057	-	-	-
Styrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.17	2.1	-	-	0.10	0.040	-	-
1,2,3-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit																								
Location		K19-TP16-26	K19-TP16-26	K19-TP16-27	K19-TP16-27	K19-TP16-27	K19-TP16-28	K19-TP16-28	K19-TP16-28	K19-TP16-29	K19-TP16-29	K19-TP16-29	K19-TP16-30	K19-TP16-30	K19-TP16-30	K19-TP16-30	K19-TP16-31	K19-TP16-31	K19-TP16-31	K19-TP16-32	K19-TP16-32	K19-TP16-32	K19-TP16-33	K19-TP16-34
Sample Name		01482-12	01483-02	01483-03	01483-04	01483-06	01484-01	01484-02	01484-04	01484-07	01484-11	01484-12	01485-01	01485-04	01485-06	01485-07	01485-08	01485-11	PK9459-01485-08	01486-02	01486-03	01486-05	01486-07	01486-11
Sample Date		8/31/2016	8/31/2016	8/31/2016	8/31/2016	8/31/2016	8/31/2016	8/31/2016	8/31/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/1/2016	9/2/2016
Sample Depth		2.1-2.1 m	2.5-2.5 m	0.4-0.4 m	1.5-1.5 m	3.5-3.5 m	0.4-0.4 m	1.5-1.5 m	3-3 m	1-1 m	3.8-3.8 m	4.3-4.3 m	1-1 m	2.9-2.9 m	3.8-3.8 m	4.3-4.3 m	0.9-0.9 m	2.8-2.8 m	0.9-0.9 m	2-2 m	2.9-2.9 m	2.9-2.9 m	1-1 m	1.5-1.5 m
SYS_SAMPLE_CODE		PK6792	PK6794	PK6795	PK6796	PK6798	PK9440	PK9441	PK9443	PK9446	PK9450	PK9451	PK9452	PK9455	PK9457	PK9458	PK9459	PK9462	DAF958	PK9775	PK9776	PK9778	PK9780	PK9784
PARENT_SAMPLE_CODE																						PK9776		
SAMPLE_TYPE_CODE		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	N
FIELD_SDG		B675549	B675549	B675549	B675549	B675549	B675954	B675954	B675954	B675954	B675954	B675954	B675954	B675954	B675954	B675954	B675954	B675954	B6J0794	B676013	B676013	B676013	B676013	B676013
PAH																								
Acenaphthene	mg/kg	-	0.020	-	-	0.022	-	0.027	0.041	-	0.016	0.013	0.022	0.018	-	0.013	-	0.032	-	0.24	-	0.13	-	-
Acenaphthylene	mg/kg	-	-	-	-	-	-	0.0070	0.0066	-	-	-	0.0066	-	-	-	-	-	-	0.21	-	-	-	-
Anthracene	mg/kg	-	-	-	-	-	-	0.0056	0.0067	-	-	-	0.0072	0.012	-	0.0041	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg	-	-	-	-	-	-	-	0.027	-	0.023	0.022	-	-	-	0.021	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.025	0.049	-	0.020	0.031	-	0.026	0.056	-	0.076	0.059	-	-	-	0.053	0.025	0.036	-	-	-	0.056	-	-
Benzo(g,h,i)perylene	mg/kg	-	0.11	-	-	0.076	-	-	0.13	-	0.12	0.10	-	-	-	0.11	-	0.091	-	-	-	0.12	-	-
Benzo(k)fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg	-	0.12	-	-	0.071	-	-	0.037	-	0.048	0.055	-	-	-	0.066	-	0.034	-	0.061	-	-	-	-
Dibenzo(a,h)anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg	-	0.044	-	-	0.022	-	-	0.039	-	0.034	0.036	-	0.023	-	0.030	-	0.026	-	-	-	-	-	-
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg	0.042	0.047	0.041	0.042	0.044	-	0.042	0.064	0.041	0.062	0.059	-	0.041	-	0.058	0.042	0.044	-	-	-	-	-	-
Benzo(b,j) fluoranthene	mg/kg	0.025	0.049	-	0.020	0.031	-	0.026	0.056	-	0.076	0.059	-	-	-	0.053	0.025	0.036	-	-	-	0.056	-	-
Fluorene	mg/kg	-	-	-	-	0.078	-	0.064	0.15	-	0.035	0.026	0.092	0.038	-	0.026	-	0.15	-	0.78	-	0.35	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	-	-	-	-	0.027	-	0.32	0.33	-	1.8	0.29	26	11	-	2.6	-	0.027	-	6.1	-	1.2	-	2.4
Phenanthrene	mg/kg	0.023	0.10	-	0.020	0.20	-	0.11	0.36	-	0.13	0.10	0.092	0.067	-	0.12	0.028	0.35	-	0.93	-	0.42	-	-
Pyrene	mg/kg	-	0.093	-	-	0.051	-	-	0.081	-	0.095	0.078	-	-	-	0.070	-	0.055	-	-	-	0.11	-	-
2-methylnaphthalene	mg/kg	-	-	-	-	0.24	-	0.21	0.86	-	0.51	0.089	9.2	4.2	-	1.2	-	0.27	-	1.4	-	3.2	-	0.98
PAH, Low Molecular Weight	mg/kg	-	0.12	-	-	0.56	-	0.75	1.8	-	2.5	0.52	-	15	-	4.0	-	0.83	-	9.7	-	5.3	-	3.3
PAH, High Molecular Weight	mg/kg	-	0.42	-	-	0.25	-	-	0.37	-	0.40	0.35	-	-	-	0.35	-	0.24	-	0.061	-	0.29	-	-
PAH, Total	mg/kg	-	0.54	-	-	0.82	-	0.78	2.1	-	2.9	0.87	-	15	-	4.4	0.052	1.1	-	9.7	-	5.6	-	3.3
EPH (C10-C19)	mg/kg	-	150	-	-	-	-	690	290	-	400	300	4700	1600	-	600	-	130	-	5800	-	2200	-	280
LEPH (C10-C19) Less PAHs	mg/kg	-	150	-	-	-	-	690	290	-	400	300	4700	1600	-	590	-	130	-	5700	-	2200	-	280
EPH (C19-C32)	mg/kg	-	140	-	-	-	-	-	110	-	380	460	510	130	-	370	-	120	-	230	-	210	-	-
HEPH (C19-C32) Less PAHs	mg/kg	-	130	-	-	-	-	-	110	-	380	460	510	130	-	370	-	120	-	230	-	210	-	-
VPH (C6-C10)	mg/kg	-	58	-	-	17	-	33	26	-	230	91	3200	6100	1400	690	-	14	-	220|220	210|210	-	-	-
VHC (C6-C10)	mg/kg	-	60	-	-	17	-	34	27	-	250	98	3400	6600	-	750	-	14	-	220	220	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg	-	69	-	-	19	-	36	30	-	250	110	3300	6800	1700	780	-	15	-	230|230	220|220	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg	-	71	-	-	19	-	37	31	-	270	120	3600	7200	-	840	-	15	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	4300	1900	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	650	160	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	290	68	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																								
Bromodichloromethane (BDCM)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	7.1	6.9	2.0	0.82	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0.34	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	2.7	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	2.4	12	4.3	35	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	0.92	0.64	0.30	0.12	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	0.085	0.30	0.14	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6	2.1	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	0.30	0.15	0.10	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	0.15	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	4.8	4.4	1.9	0.52	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg	-	0.20	-	-	-	-	0.035	0.016	-	-	0.75	1.8	20	13	19	0.027	0.015	-	0.12	0.23	-	-	-
Toluene	mg/kg	-	0.061	-	-	-	-	-	0.070	0.043	1.8	1.4	27	110	7.2	9.3	0.055	0.030	-	0.060	0.025	-	-	-
Ethylbenzene	mg/kg	-	0.40	-	-	-	-	0.078	0.13	-	7.1	1.7	8.8	54	19	7.8	-	0.026	-	0.070	2.5	-	-	-
Xylenes, Total	mg/kg	-	1.3	-	-	-	-	0.28	0.25	-	15	3.1	190	310	52	21	-	0.060	-	1.5	10	-	-	-
o-Xylene	mg/kg	-	0.12	-	-	-	-	-	0.061	-	1.3	0.40	64	110	5.8	3.9	-	-	-	0.13	0.053	-	-	-
Styrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0.25	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg	-	1.2	-	-	-	-	0.28	0.19	-	13	2.7	130	190	47	17	-	0.060	-	1.4	10	-	-	-
1,2,3-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit																							
Location		K19-TP16-34	K19-TP16-35	K19-TP16-35	K19-TP16-35	K19-TP16-35	K19-TP16-35	K19-TP16-36	K19-TP16-36	K19-TP16-37	K19-TP16-38	K19-TP16-39	K19-TP16-39	K19-TP16-40	K19-TP16-40	K19-TP16-41	K19-TP16-41	K19-TP16-41	K19-TP16-42	K19-TP16-42	K19-TP16-42	K19-TP16-43	K19-TP16-43	K19-TP16-43
Sample Name		01487-02	01487-05	01487-06/K19-TP16-35	01487-07/K19-TP16-35	01487-08	01487-09	01488-01	01488-04	01488-07	01488-11	01489-05	01489-07	01489-06	01489-08	01489-10	01489-12	01490-04	01490-05	01490-06	01490-08	01490-11	01490-12	01491-02
Sample Date		9/2/2016	9/2/2016	9/2/2016	9/2/2016	9/2/2016	9/2/2016	9/2/2016	9/2/2016	9/2/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016
Sample Depth		3.4-3.4 m	2-2 m	3-3 m	2-2 m	3.8-3.8 m	4.4-4.4 m	1-1 m	2.9-2.9 m	2.5-2.5 m	1-1 m	2-2 m	2-2 m	0.5-0.5 m	1-1 m	0.45-0.45 m	0.7-0.7 m	4-4 m	1-1 m	2-2 m	3.5-3.5 m	0.8-0.8 m	1.7-1.7 m	3-3 m
SYS_SAMPLE_CODE		PK9787	PK9790	PK9791	PK9792	PK9793	PK9794	PL2461	PL2464	PL2467	PL2471	PL2477	PL2479	PL2478	PL2480	PL2482	PL2484	PL2488	PL2489	PL2490	PL2492	PL2495	PL2496	PL2499
PARENT_SAMPLE_CODE					PK9790								PL2477											
SAMPLE_TYPE_CODE		N	N	N	FD	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N
FIELD_SDG		B676013	B676013	B676013	B676013	B676013	B676013	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470
PAH																								
Acenaphthene	mg/kg	-	-	-	-	-	-	-	-	-	-	0.078	0.13	0.14	-	-	-	0.0074	-	0.043	-	-	-	-
Acenaphthylene	mg/kg	-	-	-	-	-	-	-	-	-	-	0.032	0.047	0.049	0.037	-	-	-	-	0.014	-	-	-	-
Anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	0.0083	0.015	0.013	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	-	-	-	-	-	-	-	0.024	-	0.020	0.034	0.036	-	-	-	-	0.022	-	-	0.028	-	-	0.041
Benzo(g,h,i)perylene	mg/kg	0.063	-	-	-	-	-	-	-	-	-	-	0.054	-	-	-	-	0.073	-	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg	0.094	-	-	-	0.061	-	-	-	-	-	-	0.021	-	-	-	-	-	-	-	0.026	-	-	0.021
Dibenzo(a,h)anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg	-	-	-	-	-	-	0.041	0.042	0.041	0.042	0.043	0.044	0.041	0.041	-	0.041	0.042	-	0.041	0.043	-	0.041	0.044
Benzo(b,j) fluoranthene	mg/kg	-	-	-	-	-	-	-	0.024	-	0.020	0.034	0.036	-	-	-	-	0.022	-	-	0.028	-	-	0.041
Fluorene	mg/kg	-	-	-	-	-	-	-	-	-	-	0.25	0.38	0.29	0.035	-	-	0.065	-	0.26	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	2.3	3.5	-	3.8	4.4	-	-	-	0.016	-	6.3	19	3.8	0.13	-	-	0.086	-	0.023	-	-	-	-
Phenanthrene	mg/kg	0.12	0.061	-	0.060	0.092	-	0.015	0.038	0.040	0.010	0.20	0.25	0.36	0.065	-	-	0.16	-	0.18	0.040	-	0.011	0.029
Pyrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	0.024	-	-	-	-	0.035	-	-	-	-	-	-
2-methylnaphthalene	mg/kg	1.2	1.4	-	1.5	2.1	-	-	-	0.050	-	13	37	16	0.76	-	-	0.29	-	0.12	-	-	-	-
PAH, Low Molecular Weight	mg/kg	3.6	4.9	-	5.4	6.6	-	-	-	0.11	-	20	56	21	1.0	-	-	0.61	-	0.65	-	-	-	-
PAH, High Molecular Weight	mg/kg	0.16	-	-	-	0.061	-	-	-	-	-	-	0.13	-	-	-	-	0.13	-	-	0.055	-	-	0.062
PAH, Total	mg/kg	3.7	4.9	-	5.4	6.7	-	-	0.061	0.11	-	20	56	21	1.0	-	-	0.74	-	0.65	0.095	-	-	0.091
EPH (C10-C19)	mg/kg	410	510	-	510	700	-	-	-	-	-	2000	4700	5700	1700	-	-	-	-	1400	110	-	-	-
LEPH (C10-C19) Less PAHs	mg/kg	400	500	-	510	690	-	-	-	-	-	2000	4700	5700	1700	-	-	-	-	1400	110	-	-	-
EPH (C19-C32)	mg/kg	230	120	-	140	140	-	-	-	-	-	-	170	140	-	-	-	-	-	-	-	-	-	-
HEPH (C19-C32) Less PAHs	mg/kg	230	120	-	140	140	-	-	-	-	-	-	170	140	-	-	-	-	-	-	-	-	-	-
VPH (C6-C10)	mg/kg	610|610	-	2800|2800	-	410|410	1200|1200	-	-	-	-	480	460	2000	390	-	-	-	-	37	-	-	-	-
VHC (C6-C10)	mg/kg	630	-	2900	-	480	1200	-	-	-	-	510	490	2000	390	-	-	-	-	37	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg	670|670	-	3100|3100	-	430|430	1300|1100	-	-	-	-	540	520	2100	430	-	-	-	-	40	10	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg	-	-	3200|2200	-	500	1100	-	-	-	-	580	550	2200	430	-	-	-	-	40	10	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg	-	-	-	-	-	-	-	-	-	-	2500	5300	-	1800	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg	-	-	-	-	-	-	-	-	-	-	250	460	-	160	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg	-	-	-	-	-	-	-	-	-	-	20	33	-	13	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																								
Bromodichloromethane (BDCM)	mg/kg	0.61	-	-	-	-	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg	0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg	0.97	-	16	-	-	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg	0.042	-	0.46	-	0.079	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg	-	-	0.14	-	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	-	-	1.6	-	0.61	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg	-	-	0.22	-	0.060	0.13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg	0.61	-	-	-	0.42	-	-	-	-	-	-	-	-	-	-	-	-	-	0.57	-	-	-	-
1,1,2-trichloroethane	mg/kg	0.36	-	2.7	-	0.29	0.91	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg	4.7	-	19	-	1.7	18	-	-	-	-	1.1	0.89	0.40	0.39	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	0.86	-	7.3	-	14	3.3	-	-	0.022	-	0.85	0.72	0.79	0.11	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	7.3	-	34	-	9.9	16	-	-	-	-	6.1	5.2	0.15	0.17	-	-	-	-	0.011	0.010	-	-	-
Xylenes, Total	mg/kg	13	-	53	-	39	38	-	-	-	-	22	18	47	2.5	-	-	-	-	-	-	-	-	-
o-Xylene	mg/kg	0.45	-	8.7	-	16	4.6	-	-	-	-	0.37	0.37	33	0.86	-	-	-	-	-	-	-	-	-
Styrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg	13	-	45	-	24	33	-	-	-	-	22	18	14	1.6	-	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit																							
Location		K19-TP16-44	K19-TP16-45	K19-TP16-45	K19-TP16-45	K19-TP16-45	K19-TP16-46	K19-TP16-46	K19-TP16-47	K19-TP16-47	K19-TP16-47	K19-TP16-48	K19-TP16-49	K19-TP16-49	K19-TP16-49	K19-TP17-01	K19-TP17-01	K19-TP17-01	K19-TP17-02	K19-TP17-02	K19-TP17-02	K19-TP17-02	K19-TP17-03	K19-TP17-03
Sample Name		01491-04	01491-05	01491-06	01491-07	01491-08	01491-10	01491-12	01492-02	01492-03	01492-05	01492-09	01492-11	01492-12	01493-01	03343-01	03343-03	03343-05	03343-06	03343-07	03343-08	03343-10	03343-12	03344-01
Sample Date		9/4/2016	9/3/2016	9/3/2016	9/4/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	1/22/2017	1/22/2017	1/22/2017	1/22/2017	1/22/2017	1/22/2017	1/22/2017	1/22/2017	1/22/2017
Sample Depth		0.8-0.8 m	0.5-0.5 m	1-1 m	1.5-1.5 m	2-2 m	0.5-0.5 m	2-2 m	1.7-1.7 m	2.5-2.5 m	2.5-2.5 m	2.5-2.5 m	2-2 m	1.7-1.7 m	3-3 m	0.5-0.5 m	2.4-2.4 m	4.2-4.2 m	0.2-0.2 m	1.8-1.8 m	1.8-1.8 m	2.5-2.5 m	0.5-0.5 m	1.8-1.8 m
SYS_SAMPLE_CODE		PL2501	PL2502	PL2503	PL2504	PL2505	PL2507	PL2509	PL2511	PL2512	PL2514	PL2518	PL2520	PL2521	PL2522	QL7790	QL7792	QL7794	QL7795	QL7796	QL7797	QL7799	QL7801	QL7802
PARENT_SAMPLE_CODE											PL2512										QL7796			
SAMPLE_TYPE_CODE		N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	FD	N	N	N
FIELD_SDG		B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358
PAH																								
Acenaphthene	mg/kg	-	-	-	-	-	1.0	0.011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	mg/kg	-	-	-	-	-	0.55	0.013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg	-	-	-	-	-	0.13	0.0056	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg	-	-	-	-	-	0.30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg	-	-	-	-	-	0.31	0.069	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	-	-	-	0.022	-	0.30	0.093	-	0.034	0.030	0.033	0.023	-	0.027	-	0.065	0.060	-	0.037	0.033	0.044	-	0.032
Benzo(g,h,i)perylene	mg/kg	-	-	-	-	-	0.16	-	-	-	-	0.067	-	-	-	-	0.068	0.051	-	-	-	0.052	-	-
Benzo(k)fluoranthene	mg/kg	-	-	-	-	-	0.15	0.036	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg	-	-	-	-	-	0.31	0.048	-	-	-	0.038	-	-	0.031	-	0.089	0.094	-	0.035	0.040	0.069	-	-
Dibenzo(a,h)anthracene	mg/kg	-	-	-	-	-	0.052	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg	-	-	-	-	-	0.84	-	-	-	-	0.022	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg	-	0.041	-	0.042	-	0.47	0.12	0.041	0.043	0.043	0.044	0.042	-	0.043	-	0.048	0.047	-	0.044	0.043	0.045	-	0.043
Benzo(b,j) fluoranthene	mg/kg	-	-	-	0.022	-	0.47	0.13	-	0.034	0.030	0.033	0.023	-	0.027	-	0.065	0.060	-	0.037	0.033	0.044	-	0.032
Fluorene	mg/kg	-	-	-	-	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg	-	-	-	-	-	0.16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	-	-	-	-	-	0.41	0.25	-	-	-	-	-	-	-	-	0.011	0.015	-	-	-	0.020	-	-
Phenanthrene	mg/kg	-	-	-	0.019	-	0.63	0.016	-	0.025	0.023	0.050	0.021	-	0.049	-	0.054	0.061	-	0.034	0.050	0.089	-	0.029
Pyrene	mg/kg	-	-	-	-	-	1.4	0.033	-	-	-	0.035	-	-	0.031	-	0.026	0.031	-	-	-	0.023	-	-
2-methylnaphthalene	mg/kg	-	-	-	-	-	2.2	-	-	-	-	-	-	-	-	-	0.023	0.033	-	-	0.021	0.053	-	-
PAH, Low Molecular Weight	mg/kg	-	-	-	-	-	7.0	0.30	-	-	-	0.050	-	-	-	-	0.089	0.11	-	-	0.071	0.16	-	-
PAH, High Molecular Weight	mg/kg	-	-	-	-	-	4.2	0.32	-	-	-	0.20	-	-	0.089	-	0.25	0.24	-	0.072	0.073	0.19	-	-
PAH, Total	mg/kg	-	-	-	-	-	11	0.62	-	0.059	0.054	0.25	-	-	0.14	-	0.34	0.34	-	0.11	0.14	0.35	-	0.061
EPH (C10-C19)	mg/kg	-	-	-	-	-	22000	140	-	-	-	100	-	-	-	-	-	-	-	-	-	140	-	-
LEPH (C10-C19) Less PAHs	mg/kg	-	-	-	-	-	22000	140	-	-	-	100	-	-	-	-	-	-	-	-	-	140	-	-
EPH (C19-C32)	mg/kg	-	-	-	-	-	890	-	-	-	-	190	-	-	-	-	-	-	-	-	-	110	-	-
HEPH (C19-C32) Less PAHs	mg/kg	-	-	-	-	-	890	-	-	-	-	190	-	-	-	-	-	-	-	-	-	110	-	-
VPH (C6-C10)	mg/kg	-	-	-	-	-	56	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VHC (C6-C10)	mg/kg	-	-	-	-	-	56	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg	-	-	-	-	-	62	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg	-	-	-	-	-	62	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg	-	-	-	-	-	19000	170	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg	-	-	-	-	-	2600	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg	-	-	-	-	-	200	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																								
Bromodichloromethane (BDCM)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg	-	-	-	-	-	2.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.11	-	-
1,1,2-trichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	-	-	-	-	-	0.011	0.031	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.048	-	-
o-Xylene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.048	-	-
1,2,3-Trichlorobenzene	mg/kg	-	-	-	-	-	0.083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	-	-	-	-	-	0.12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit	Location	K19-TP17-03	K19-TP17-03	K19-TP17-04	K19-TP17-04	K19-TP17-04	K19-TP17-04	K19-TP17-05	K19-TP17-05	K19-TP17-05	K19-TP17-05	K19-TP17-05	K19-TP17-06	K19-TP17-06	K19-TP17-07	K19-TP17-07	K19-TP17-08	K19-TP17-08	K19-TP17-09	K19-TP17-09	K19-TP17-09	K19-TP17-10	K19-TP17-10	K19-TP17-10
		Sample Name	03344-02	03344-04	03344-05	03344-06	03344-07	03344-09	03344-10	03344-11	03344-12	03345-01	03345-02	03345-05	03345-10	03345-11	03346-02	03346-03	03346-05	03346-07	03346-08	03346-09	03346-12	03347-01	03347-05
		Sample Date	1/22/2017	1/22/2017	1/23/2017	1/23/2017	1/23/2017	1/23/2017	1/23/2017	1/23/2017	1/23/2017	1/23/2017	1/23/2017	1/24/2017	1/24/2017	1/24/2017	1/24/2017	1/24/2017	1/24/2017	1/24/2017	1/24/2017	1/24/2017	1/24/2017	1/24/2017	1/24/2017
		Sample Depth	2.5-2.5 m	3.8-3.8 m	0.5-0.5 m	2.5-2.5 m	1.5-1.5 m	4-4 m	0.5-0.5 m	0.5-0.5 m	1.6-1.6 m	2.6-2.6 m	3.5-3.5 m	0.5-0.5 m	4.2-4.2 m	0.5-0.5 m	3.4-3.4 m	0.5-0.5 m	2.5-2.5 m	0.5-0.5 m	1.5-1.5 m	2.5-2.5 m	0.5-0.5 m	0.5-0.5 m	3.8-3.8 m
		SYS_SAMPLE_CODE	QL7803	QL7805	QL7806	QL7807	QL7808	QL7810	QL7811	QL7812	QL7813	QL7814	QL7815	QL7818	QL7823	QL7824	QL7828	QL7829	QL7831	QL7833	QL7834	QL7835	QL7838	QL7839	QL7843
		PARENT_SAMPLE_CODE								QL7811														QL7838	
		SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N
		FIELD_SDG	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358
PAH																									
Acenaphthene	mg/kg		-	0.0068	-	0.0055	-	-	-	-	-	-	-	-	0.039	-	0.0097	-	-	-	-	-	-	-	0.017
Acenaphthylene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	0.0065	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg		-	-	-	0.0076	-	-	-	-	-	-	-	-	0.0042	-	0.013	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	0.035	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg		0.034	0.038	-	0.023	-	-	-	-	-	0.037	-	-	0.068	-	0.056	-	0.054	-	-	0.052	-	-	0.046
Benzo(g,h,i)perylene	mg/kg		-	0.056	-	-	-	-	-	-	-	-	-	-	0.18	-	0.056	-	-	-	-	-	-	-	0.067
Benzo(k)fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg		0.038	0.068	-	0.037	-	-	-	-	-	0.032	-	-	0.15	-	0.11	-	0.084	-	-	0.090	-	-	0.088
Dibenzo(a,h)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	0.053	-	0.049	-	-	-	-	0.020	-	-	0.030
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg		0.044	0.045	-	0.042	-	-	-	-	-	0.044	-	-	0.074	-	0.047	-	0.046	-	-	0.046	-	-	0.046
Benzo(b,j) fluoranthene	mg/kg		0.034	0.038	-	0.023	-	-	-	-	-	0.037	-	-	0.068	-	0.056	-	0.054	-	-	0.052	-	-	0.046
Fluorene	mg/kg		-	-	-	0.034	-	-	-	-	-	-	-	-	0.19	-	-	-	-	-	-	-	-	-	0.067
Indeno(1,2,3-c,d)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	0.31	-	0.037	-	0.012	-	-	0.018	-	-	0.12
Phenanthrene	mg/kg		0.036	0.087	-	0.11	-	-	-	-	-	0.023	-	-	0.50	-	0.23	-	0.056	-	-	0.085	-	-	0.20
Pyrene	mg/kg		-	0.033	-	0.033	-	-	-	-	-	-	-	-	0.11	-	0.054	-	0.025	-	-	0.031	-	-	0.052
2-methylnaphthalene	mg/kg		-	0.024	-	0.039	-	-	-	-	-	-	-	-	1.0	-	0.080	-	-	-	-	0.027	-	-	0.34
PAH, Low Molecular Weight	mg/kg		-	0.12	-	0.19	-	-	-	-	-	-	-	-	2.1	-	0.37	-	0.068	-	-	0.13	-	-	0.75
PAH, High Molecular Weight	mg/kg		0.072	0.20	-	0.093	-	-	-	-	-	0.069	-	-	0.59	-	0.32	-	0.16	-	-	0.19	-	-	0.28
PAH, Total	mg/kg		0.11	0.31	-	0.29	-	-	-	-	-	0.092	-	-	2.7	-	0.70	-	0.23	-	-	0.32	-	-	1.0
EPH (C10-C19)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	110	-	-	-	-	-	-	-	-	-	-
LEPH (C10-C19) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	110	-	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	mg/kg		-	150	-	200	-	-	-	-	-	-	-	-	120	-	-	-	-	-	-	-	-	-	-
HEPH (C19-C32) Less PAHs	mg/kg		-	150	-	200	-	-	-	-	-	-	-	-	120	-	-	-	-	-	-	-	-	-	-
VPH (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	26	-	-	-	-	-	-	-	-	-	14
VHC (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	26	-	-	-	-	-	-	-	11	10	14
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	28	-	-	-	-	-	-	-	11	-	15
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	29	-	-	-	-	-	-	-	14	12	15
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																									
Bromodichloromethane (BDCM)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	0.11	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.35	0.65	-
Toluene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6	2.9	0.047
Ethylbenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	0.018	-	-	-	-	-	-	-	0.14	0.21	-
Xylenes, Total	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	0.062	-	-	-	-	-	-	-	1.7	2.5	-
o-Xylene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.27	0.40	-
Styrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	0.062	-	-	-	-	-	-	-	1.4	2.1	-
1,2,3-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit																								
Location		K19-TP17-11	K19-TP17-11	K19-TP17-12	K19-TP17-12	K19-TP17-13	K19-TP17-13	K19-TP17-13	K19-TP17-14	K19-TP17-14	K19-TP17-15	K19-TP17-15	K19-TP17-15	K19-TP17-16	K19-TP17-16	K19-TP17-16	K19-TP17-16	K19-TP17-17	K19-TP17-17	K19-TP17-18	K19-TP17-18	K19-TP17-18	K19-TP17-18	K19-TP17-19
Sample Name		03351-01	03351-03	03351-06	03351-08	03351-11	03351-12	03352-02	03352-04	03352-08	03352-11	03353-01	03353-04	03347-06	03347-07	03347-08	03347-11	03347-12	03348-01	03348-05	03349-01	03349-02	03350-07	03349-03
Sample Date		1/24/2017	1/24/2017	1/24/2017	1/24/2017	1/24/2017	1/24/2017	1/24/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017
Sample Depth		0.6-0.6 m	2.5-2.5 m	0.5-0.5 m	2.4-2.4 m	0.6-0.6 m	1.6-1.6 m	3.4-3.4 m	0.5-0.5 m	3.4-3.4 m	1.6-1.6 m	3.5-3.5 m	4.9-4.9 m	0.5-0.5 m	1.5-1.5 m	1.5-1.5 m	4.2-4.2 m	0.5-0.5 m	1.5-1.5 m	0.5-0.5 m	3.4-3.4 m	4-4 m	2.5-2.5 m	0.4-0.4 m
SYS_SAMPLE_CODE		QL7856	QL7858	QL7861	QL7863	QL7866	QL7867	QL7871	QL7873	QL7877	QL7880	QM7176	QM7179	QL7844	QL7845	QL7846	QL7849	QL7850	QL7851	QL7855	QM7146	QM7147	QM7164	QM7148
PARENT_SAMPLE_CODE																QL7845								
SAMPLE_TYPE_CODE		N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N
FIELD_SDG		B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B708210	B708210	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B708210	B708210	B708210	B708210
PAH																								
Acenaphthene	mg/kg	-	-	-	-	-	0.0086	0.020	-	-	-	0.068	0.024	-	0.45	0.28	0.033	-	-	-	0.018	0.020	0.015	-
Acenaphthylene	mg/kg	-	-	-	-	-	-	0.0082	-	-	-	0.017	-	-	0.10	0.071	0.0065	-	-	-	-	-	-	-
Anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	0.0054	-	-	0.038	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	0.021	-	-	-	0.028	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	-	0.051	-	0.027	-	0.038	0.034	-	0.049	-	0.053	0.051	-	0.029	0.032	0.063	-	0.047	-	0.041	0.040	0.041	-
Benzo(g,h,i)perylene	mg/kg	-	-	-	-	-	-	-	-	0.068	-	0.079	0.12	-	-	-	0.14	-	-	-	0.073	0.092	-	-
Benzo(k)fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg	-	0.083	-	0.024	-	0.038	0.042	-	0.11	-	0.034	0.034	-	0.035	0.032	0.13	-	0.031	-	0.041	0.028	-	-
Dibenzo(a,h)anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg	-	0.021	-	-	-	-	-	-	0.042	-	0.045	0.039	-	-	-	0.050	-	-	-	0.030	0.034	-	-
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg	-	0.046	-	0.043	-	0.044	0.044	-	0.046	0.041	0.046	0.057	-	0.043	0.043	0.067	-	0.045	-	0.045	0.045	0.044	-
Benzo(b,j) fluoranthene	mg/kg	-	0.051	-	0.027	-	0.038	0.034	-	0.049	-	0.053	0.051	-	0.029	0.032	0.063	-	0.047	-	0.041	0.040	0.041	-
Fluorene	mg/kg	-	-	-	-	-	0.026	0.049	-	-	-	0.13	0.10	-	0.59	0.47	0.11	-	-	-	0.057	0.11	0.063	-
Indeno(1,2,3-c,d)pyrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	-	0.018	-	-	-	0.030	0.054	-	0.027	-	0.11	0.25	-	3.0	2.1	0.30	-	-	-	0.032	0.26	0.031	-
Phenanthrene	mg/kg	-	0.092	-	0.018	-	0.059	0.055	-	0.21	-	0.31	0.30	-	0.51	0.47	0.39	-	0.012	-	0.19	0.27	0.067	-
Pyrene	mg/kg	-	0.029	-	-	-	-	-	-	0.069	-	0.062	0.065	-	0.022	0.022	0.084	-	-	-	0.053	0.059	-	-
2-methylnaphthalene	mg/kg	-	0.026	-	-	-	0.13	0.060	-	0.075	-	0.28	0.58	-	0.59	0.38	0.58	-	-	-	0.13	0.59	0.049	-
PAH, Low Molecular Weight	mg/kg	-	0.14	-	-	-	0.25	0.25	-	0.31	-	0.93	1.3	-	5.3	3.7	1.4	-	-	-	0.43	1.3	0.22	-
PAH, High Molecular Weight	mg/kg	-	0.18	-	0.050	-	0.077	0.076	-	0.34	-	0.27	0.33	-	0.087	0.085	0.49	-	0.078	-	0.24	0.25	-	-
PAH, Total	mg/kg	-	0.32	-	0.068	-	0.33	0.32	-	0.65	-	1.2	1.6	-	5.4	3.8	1.9	-	0.090	-	0.66	1.5	0.27	-
EPH (C10-C19)	mg/kg	-	-	-	-	-	650	380	-	-	-	740	180	-	4800	4600	160	-	-	-	180	-	140	-
LEPH (C10-C19) Less PAHs	mg/kg	-	-	-	-	-	650	380	-	-	-	740	180	-	4800	4600	160	-	-	-	180	-	140	-
EPH (C19-C32)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HEPH (C19-C32) Less PAHs	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	14	21	-	190	340	14	-	-	-	-	-	-	-
VHC (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	14	21	-	190	340	14	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg	-	-	-	-	-	-	-	-	-	-	14	20	-	190	350	14	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	14	20	-	190	350	14	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																								
Bromodichloromethane (BDCM)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0.061	0.11	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg	-	-	-	-	-	-	-	-	0.22	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg	-	-	-	-	-	-	0.17	-	-	-	-	-	-	8.4	12	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	0.0072	-	-	0.0065	-	-	-	-	-	-	-	-
Toluene	mg/kg	-	-	-	-	-	-	-	-	0.099	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	0.012	0.037	-	0.27	0.43	0.021	-	-	-	-	-	-	-
Xylenes, Total	mg/kg	-	-	-	-	-	-	-	-	-	-	-	0.13	-	0.10	0.15	0.061	-	-	-	-	-	-	-
o-Xylene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	0.042	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg	-	-	-	-	-	-	-	-	-	-	-	0.091	-	0.10	0.15	0.061	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	0.040	-	0.22	0.39	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0.22	0.22	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit	Location	K19-TP17-19	K19-TP17-19	K19-TP17-20	K19-TP17-20	K19-TP17-20	K19-TP17-21	K19-TP17-21	K19-TP17-21	K19-TP17-21	K19-TP17-21	K19-TP17-22	K19-TP17-22	K19-TP17-22	K19-TP17-23	K19-TP17-23	K19-TP17-24	K19-TP17-24	K19-TP17-24	K19-TP17-25	K19-TP17-25	K19-TP17-26	K19-TP17-26	K19-TP17-26
		Sample Name	03349-05	03349-07	03349-09	03349-10	03350-01	03353-05	03353-06	03353-07	03353-08	03353-11	03353-12	03354-04	03354-06	03354-09	03354-11	03355-02	03355-05	03355-07	03355-08	03355-10	03350-02	03350-03	03350-08
		Sample Date	1/25/2017	1/25/2017	1/26/2017	1/26/2017	1/26/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017
		Sample Depth	2.6-2.6 m	4-4 m	1.6-1.6 m	2.5-2.5 m	4.1-4.1 m	0.6-0.6 m	1.5-1.5 m	2.4-2.4 m	2.4-2.4 m	4.6-4.6 m	0.5-0.5 m	2.9-2.9 m	5.1-5.1 m	2.1-2.1 m	3.2-3.2 m	0.6-0.6 m	2.5-2.5 m	4-4 m	0.6-0.6 m	2.5-2.5 m	0.5-0.5 m	1.5-1.5 m	4.4-4.4 m
		SYS_SAMPLE_CODE	QM7150	QM7152	QM7154	QM7155	QM7158	QM7180	QM7181	QM7182	QM7183	QM7186	QM7187	QM7191	QM7193	QM7196	QM7198	QM7204	QM7207	QM7209	QM7210	QM7212	QM7159	QM7160	QM7165
		PARENT_SAMPLE_CODE									QM7182														
		SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N
		FIELD_SDG	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210
PAH																									
Acenaphthene	mg/kg		-	0.018	-	-	0.032	-	-	0.12	0.13	0.029	0.27	0.18	0.099	-	0.068	-	0.048	0.029	-	0.0091	-	-	0.010
Acenaphthylene	mg/kg		-	-	-	-	-	-	-	0.031	0.021	-	-	0.0091	0.013	-	0.011	-	0.0080	-	-	-	-	-	-
Anthracene	mg/kg		-	-	-	-	-	-	-	0.052	0.045	0.0050	0.014	0.021	0.0056	-	0.0076	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg		-	0.021	-	-	0.025	-	-	-	-	0.024	-	-	0.025	-	-	-	-	0.028	-	0.025	-	-	-
Benzo(b)fluoranthene	mg/kg		0.048	0.044	-	0.047	0.046	-	-	0.043	0.050	0.052	-	0.048	0.056	0.024	0.045	-	0.041	0.056	-	0.057	-	0.022	0.064
Benzo(g,h,i)perylene	mg/kg		-	0.10	-	-	0.15	-	-	-	-	0.13	-	0.068	0.15	-	0.073	-	-	0.15	-	0.11	-	-	0.093
Benzo(k)fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg		0.026	0.077	-	0.021	0.029	-	-	0.024	0.028	0.035	-	0.047	0.037	-	0.038	-	0.027	0.037	-	0.028	-	-	0.056
Dibenzo(a,h)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg		-	0.036	-	0.024	0.032	-	-	0.049	0.057	0.043	-	0.040	0.039	-	0.040	-	0.021	0.039	-	0.030	-	-	0.032
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg		0.045	0.057	-	0.045	0.060	-	0.041	0.044	0.045	0.060	0.041	0.045	0.062	0.042	0.045	-	0.044	0.065	-	0.062	-	0.042	0.047
Benzo(b,j) fluoranthene	mg/kg		0.048	0.044	-	0.047	0.046	-	-	0.043	0.050	0.052	-	0.048	0.056	0.024	0.045	-	0.041	0.056	-	0.057	-	0.022	0.064
Fluorene	mg/kg		-	0.090	-	-	0.13	-	-	0.46	0.50	0.16	0.077	0.99	0.37	-	0.25	-	0.11	0.14	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg		0.011	0.11	-	0.029	0.21	-	-	0.40	0.47	0.43	0.044	2.1	1.5	-	0.78	-	0.080	0.22	-	0.018	-	-	1.2
Phenanthrene	mg/kg		0.041	0.24	-	0.11	0.29	-	0.031	1.2	1.2	0.39	0.063	0.97	0.53	0.019	0.39	-	0.13	0.33	-	0.078	-	0.027	0.11
Pyrene	mg/kg		0.029	0.053	-	0.038	0.063	-	0.024	0.075	0.084	0.075	0.021	0.053	0.067	-	0.056	-	-	0.073	-	0.075	-	-	0.080
2-methylnaphthalene	mg/kg		-	0.40	-	0.041	0.62	-	0.028	0.29	0.35	0.89	0.19	6.1	3.0	-	2.7	-	0.29	0.66	-	0.055	-	-	0.41
PAH, Low Molecular Weight	mg/kg		0.053	0.86	-	0.18	1.3	-	0.059	2.7	3.0	1.9	0.65	10	5.6	-	4.2	-	0.66	1.4	-	0.16	-	-	1.7
PAH, High Molecular Weight	mg/kg		0.10	0.33	-	0.13	0.34	-	-	0.19	0.22	0.36	-	0.26	0.37	-	0.25	-	0.089	0.38	-	0.32	-	-	0.33
PAH, Total	mg/kg		0.16	1.2	-	0.31	1.6	-	0.083	2.9	3.2	2.3	0.67	11	5.9	-	4.5	-	0.75	1.8	-	0.49	-	-	2.0
EPH (C10-C19)	mg/kg		-	-	-	-	-	-	180	1100	1100	130	4800	1900	750	-	1300	-	260	-	-	-	-	-	360
LEPH (C10-C19) Less PAHs	mg/kg		-	-	-	-	-	-	180	1100	1100	130	4800	1900	750	-	1300	-	260	-	-	-	-	-	360
EPH (C19-C32)	mg/kg		-	-	-	-	-	-	-	160	170	-	310	120	110	-	100	-	-	-	-	170	-	-	200
HEPH (C19-C32) Less PAHs	mg/kg		-	-	-	-	-	-	-	160	170	-	310	120	110	-	100	-	-	-	-	170	-	-	200
VPH (C6-C10)	mg/kg		-	12	-	-	16	-	-	51	49	22	-	49	18	-	26	-	-	-	-	-	-	-	500
VHC (C6-C10)	mg/kg		-	12	-	-	16	-	-	51	50	22	-	49	19	-	27	-	-	-	-	-	-	-	550
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg		-	13	-	-	17	-	-	53	51	22	-	52	20	-	30	-	-	-	-	-	-	-	530
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg		-	13	-	-	17	-	-	53	52	23	-	53	20	-	31	-	-	-	-	-	-	-	580
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																									
Bromodichloromethane (BDCM)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1
Chlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.10
Chloroform	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.26	-	-	-	-	-	-	-	2.5
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.069
1,2-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6
1,2-dichloropropane (Propylene Dichloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.096
1,3-dichloropropene (Trans)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.67
Trichloroethylene (TCE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.016
Benzene	mg/kg		-	-	-	-	-	-	-	0.0060	0.0078	-	-	0.011	0.0052	-	0.0064	-	-	-	-	-	-	-	20
Toluene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	0.024	-	0.055	-	-	-	-	0.028	-	-	3.7
Ethylbenzene	mg/kg		-	-	-	-	0.029	-	-	0.16	0.21	0.068	-	0.27	0.18	-	0.14	-	-	-	-	-	-	-	11
Xylenes, Total	mg/kg		-	-	-	-	0.080	-	-	0.18	0.27	0.28	-	0.34	0.56	-	0.33	-	-	-	-	-	-	-	18
o-Xylene	mg/kg		-	-	-	-	-	-	-	-	-	0.092	-	-	0.14	-	0.056	-	-	-	-	-	-	-	1.5
Styrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.093
m,p-Xylenes	mg/kg		-	-	-	-	0.080	-	-	0.18	0.27	0.19	-	0.34	0.42	-	0.27	-	-	-	-	-	-	-	16
1,2,3-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.040
1,2,4-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.030
1-Methylnaphthalene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit	Location	K19-TP17-26	K19-TP17-27	K19-TP17-27	K19-TP17-28	K19-TP17-28	K19-TP17-29	K19-TP17-29	K19-TP17-29	K19-TP17-29	K19-TP17-29	K19-TP17-30	K19-TP17-30	K19-TP17-30	K19-TP17-31	K19-TP17-31	K19-TP17-31	K19-TP17-32	K19-TP17-32	K19-TP17-32	K19-TP17-33	K19-TP17-33	K19-TP17-34	K19-TP17-34
		Sample Name	03350-11	03356-03	03356-04	03356-09	03356-11	03356-12	03357-01	03357-02	03357-04	03357-07	03357-09	03357-12	03358-01	03361-02	03361-03	03361-04	03361-07	03361-08	03361-11	03362-01	03362-03	03362-06	03362-07
		Sample Date	1/26/2017	1/26/2017	1/26/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017
		Sample Depth	6.2-6.2 m	3.5-3.5 m	4.6-4.6 m	2.6-2.6 m	4.3-4.3 m	0.5-0.5 m	1.5-1.5 m	1.5-1.5 m	3.5-3.5 m	5.8-5.8 m	1.5-1.5 m	3.2-3.2 m	4.6-4.6 m	1.6-1.6 m	1.6-1.6 m	2.5-2.5 m	0.6-0.6 m	1.4-1.4 m	3.5-3.5 m	0.5-0.5 m	2.4-2.4 m	0.6-0.6 m	1.5-1.5 m
		SYS_SAMPLE_CODE	QM7168	QM7217	QM7218	QM7223	QM7225	QM7226	QM7228	QM7229	QM7231	QM7234	QM7236	QM7239	QM7241	QM7269	QM7270	QM7271	QM7274	QM7275	QM7278	QM7281	QM7283	QM7286	QM7287
		PARENT_SAMPLE_CODE								QM7228							QM7269								
		SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N
		FIELD_SDG	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210
PAH																									
Acenaphthene	mg/kg		0.016	0.010	0.018	0.0071	0.034	-	-	-	0.10	0.024	-	0.031	0.027	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg		-	-	-	-	0.0043	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg		0.020	-	-	-	0.020	-	-	-	-	-	-	-	0.033	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg		0.049	0.045	0.054	0.043	0.058	-	0.034	0.027	0.053	0.043	0.029	0.044	0.058	-	-	0.040	-	0.026	0.043	-	0.035	-	0.022
Benzo(g,h,i)perylene	mg/kg		0.099	0.090	0.13	0.082	0.14	-	-	-	0.061	0.093	-	-	0.19	-	-	-	-	-	0.081	-	-	-	-
Benzo(k)fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg		0.042	0.035	0.052	0.035	0.056	-	-	-	0.10	0.073	-	0.077	0.043	-	-	-	-	-	0.034	-	-	-	-
Dibenzo(a,h)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg		0.032	-	0.031	-	0.034	-	-	-	0.031	0.031	-	-	0.044	-	-	-	-	-	0.039	-	-	-	-
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg		0.056	0.045	0.047	0.045	0.057	-	0.043	0.043	0.046	0.045	0.043	0.045	0.070	-	-	0.044	-	0.042	0.045	-	0.043	-	0.042
Benzo(b,j) fluoranthene	mg/kg		0.049	0.045	0.054	0.043	0.058	-	0.034	0.027	0.053	0.043	0.029	0.044	0.058	-	-	0.040	-	0.026	0.043	-	0.035	-	0.022
Fluorene	mg/kg		0.052	-	0.027	-	0.035	-	-	-	0.28	0.11	-	0.046	0.10	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg		0.24	-	0.012	-	0.017	-	-	-	0.22	0.40	-	0.043	0.069	-	-	0.013	-	-	0.046	-	0.012	-	-
Phenanthrene	mg/kg		0.17	0.055	0.14	0.077	0.21	-	0.028	0.017	0.37	0.24	0.018	0.13	0.29	-	-	0.045	-	-	0.31	-	0.027	-	0.011
Pyrene	mg/kg		0.068	0.049	0.071	0.041	0.078	-	-	-	0.038	0.046	-	0.025	0.086	-	-	-	-	-	0.057	-	-	-	-
2-methylnaphthalene	mg/kg		0.13	-	0.031	-	0.054	-	-	-	0.33	0.71	-	0.082	0.26	-	-	-	-	-	0.11	-	0.032	-	-
PAH, Low Molecular Weight	mg/kg		0.60	0.065	0.23	0.084	0.36	-	-	-	1.3	1.5	-	0.33	0.75	-	-	0.059	-	-	0.47	-	0.072	-	-
PAH, High Molecular Weight	mg/kg		0.31	0.22	0.33	0.20	0.38	-	-	-	0.28	0.29	-	0.15	0.45	-	-	-	-	-	0.25	-	-	-	-
PAH, Total	mg/kg		0.91	0.28	0.57	0.29	0.74	-	0.062	-	1.6	1.8	-	0.48	1.2	-	-	0.099	-	-	0.72	-	0.11	-	-
EPH (C10-C19)	mg/kg		250	190	280	130	320	-	-	-	1900	100	-	510	-	-	-	-	-	-	-	-	-	-	-
LEPH (C10-C19) Less PAHs	mg/kg		250	190	280	130	320	-	-	-	1900	100	-	510	-	-	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	mg/kg		210	320	330	280	380	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HEPH (C19-C32) Less PAHs	mg/kg		210	320	330	280	380	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH (C6-C10)	mg/kg		48	-	-	-	-	-	-	-	61	50	-	10	-	-	-	-	-	-	-	-	-	-	-
VHC (C6-C10)	mg/kg		54	-	-	-	-	-	-	-	61	51	-	10	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg		51	-	-	-	-	-	-	-	67	66	-	10	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg		57	-	-	-	-	-	-	-	68	67	-	10	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																									
Bromodichloromethane (BDCM)	mg/kg		0.095	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg		0.26	-	0.38	-	-	-	-	-	0.22	-	0.15	-	-	-	-	0.31	-	-	-	-	0.19	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg		0.36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg		0.048	-	-	-	-	-	-	-	0.031	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg		1.9	-	-	-	-	-	-	-	0.0075	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg		1.0	-	-	-	-	-	-	-	-	0.066	-	-	-	-	-	0.063	-	-	-	-	-	-	-
Ethylbenzene	mg/kg		0.63	-	-	-	-	-	-	-	0.089	0.21	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total	mg/kg		2.3	-	-	-	-	-	-	-	0.088	0.91	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/kg		0.42	-	-	-	-	-	-	-	-	0.28	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg		1.8	-	-	-	-	-	-	-	0.088	0.63	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit																								
Location		K19-TP17-35	K19-TP17-35	K19-TP17-36	K19-TP17-36	K19-TP17-36	K19-TP17-37	K19-TP17-37	K19-TP17-38	K19-TP17-38	K19-TP17-39	K19-TP17-39	K19-TP17-39	K19-TP17-39	K19-TP17-39	K19-TP17-40	K19-TP17-40	K19-TP17-41	K19-TP17-41	K19-TP17-41	K19-TP17-42	K19-TP17-42	K19-TP17-43	K19-TP17-43
Sample Name		03362-11	03363-03	03358-03	03358-05	03358-07	03358-08	03359-01	03359-03	03359-06	03364-10	03364-11	03364-12	03365-03	03365-04	03365-05	03365-06	03363-07	03363-08	03363-10	03363-12	03364-04	03364-05	03364-06
Sample Date		1/28/2017	1/28/2017	1/28/2017	1/28/2017	1/28/2017	1/28/2017	1/28/2017	1/28/2017	1/28/2017	1/29/2017	1/29/2017	1/29/2017	1/29/2017	1/29/2017	1/29/2017	1/29/2017	1/28/2017	1/28/2017	1/28/2017	1/28/2017	1/28/2017	1/28/2017	1/28/2017
Sample Depth		0.5-0.5 m	3.4-3.4 m	0.5-0.5 m	2.4-2.4 m	4.1-4.1 m	0.5-0.5 m	4-4 m	0.5-0.5 m	3.5-3.5 m	0.5-0.5 m	1.5-1.5 m	1.5-1.5 m	4-4 m	5.1-5.1 m	0.5-0.5 m	1.5-1.5 m	2.6-2.6 m	2.6-2.6 m	4.3-4.3 m	1.6-1.6 m	4.3-4.3 m	0.6-0.6 m	1.4-1.4 m
SYS_SAMPLE_CODE		QM7291	QM7295	QM7243	QM7245	QM7247	QM7248	QM7253	QM7255	QM7258	QM7314	QM7315	QM7316	QM7322	QM7323	QM7324	QM7325	QM7299	QM7300	QM7302	QM7304	QM7308	QM7309	QM7310
PARENT_SAMPLE_CODE													QM7315						QM7299					
SAMPLE_TYPE_CODE		N	N	N	N	N	N	N	FD	N	N	N	FD	N	N	N	N	N	FD	N	N	N	N	N
FIELD_SDG		B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210
PAH																								
Acenaphthene	mg/kg	-	-	-	0.0054	0.021	-	0.031	-	0.0065	-	-	0.021	0.045	0.036	-	-	-	-	0.024	-	0.016	-	-
Acenaphthylene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg	-	-	-	-	-	-	0.028	-	-	-	-	-	0.030	0.032	-	-	-	-	0.023	-	0.028	-	-
Benzo(b)fluoranthene	mg/kg	-	0.060	-	0.044	0.051	-	0.050	-	0.050	-	0.021	0.021	0.055	0.049	-	0.033	-	-	0.054	-	0.050	-	0.057
Benzo(g,h,i)perylene	mg/kg	-	0.092	-	-	0.11	-	0.16	-	0.095	-	-	-	0.17	0.17	-	-	-	-	0.14	-	0.13	-	0.088
Benzo(k)fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg	-	0.049	-	0.029	0.039	-	0.043	-	0.038	-	-	-	0.042	0.034	-	-	-	-	0.043	-	0.035	-	0.028
Dibenzo(a,h)anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg	-	0.035	-	-	0.037	-	0.042	-	0.022	-	-	-	0.044	0.042	-	-	-	-	0.034	-	0.039	-	-
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg	-	0.047	-	0.044	0.046	-	0.065	-	0.046	-	0.042	0.042	0.067	0.068	-	0.043	-	-	0.060	-	0.065	-	0.046
Benzo(b,j) fluoranthene	mg/kg	-	0.060	-	0.044	0.051	-	0.050	-	0.050	-	0.021	0.021	0.055	0.049	-	0.033	-	-	0.054	-	0.050	-	0.057
Fluorene	mg/kg	-	-	-	-	0.087	-	0.14	-	-	-	-	0.020	0.11	0.17	-	-	-	-	0.11	-	0.032	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	-	0.038	-	-	0.35	-	0.27	-	0.015	-	0.021	0.12	0.24	0.43	-	-	-	-	0.22	-	0.027	-	0.015
Phenanthrene	mg/kg	-	0.22	-	0.047	0.32	-	0.36	-	0.085	-	0.018	0.025	0.37	0.38	-	0.029	-	-	0.28	-	0.13	-	0.059
Pyrene	mg/kg	-	0.049	-	-	0.065	-	0.082	-	0.056	-	-	-	0.083	0.083	-	-	-	-	0.069	-	0.082	-	0.022
2-methylnaphthalene	mg/kg	-	0.065	-	-	0.77	-	0.71	-	0.044	-	-	0.17	0.63	0.97	-	-	-	-	0.65	-	0.080	-	0.022
PAH, Low Molecular Weight	mg/kg	-	0.33	-	0.052	1.5	-	1.5	-	0.15	-	-	0.35	1.4	2.0	-	-	-	-	1.3	-	0.28	-	0.097
PAH, High Molecular Weight	mg/kg	-	0.29	-	0.073	0.30	-	0.41	-	0.26	-	-	-	0.42	0.41	-	-	-	-	0.37	-	0.37	-	0.20
PAH, Total	mg/kg	-	0.61	-	0.13	1.8	-	1.9	-	0.41	-	0.059	0.38	1.8	2.4	-	0.062	-	-	1.7	-	0.65	-	0.29
EPH (C10-C19)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	340	160	-	-	-	-	-	-	-	-	-	-
LEPH (C10-C19) Less PAHs	mg/kg	-	-	-	-	-	-	-	-	-	-	-	340	160	-	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HEPH (C19-C32) Less PAHs	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH (C6-C10)	mg/kg	-	-	-	-	13	-	13	-	-	-	-	-	21	38	-	-	-	-	20	-	-	-	-
VHC (C6-C10)	mg/kg	-	-	-	-	13	-	13	-	-	-	-	-	22	39	-	-	-	-	21	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg	-	-	-	-	13	-	14	-	-	-	-	-	25	41	-	-	-	-	21	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg	-	-	-	-	13	-	14	-	-	-	-	-	25	42	-	-	-	-	21	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																								
Bromodichloromethane (BDCM)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0.082	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg	-	-	-	-	-	-	-	-	0.19	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg	-	-	-	-	0.016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0051	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	-	-	-	-	-	-	-	-	0.024	-	-	-	-	0.023	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	-	-	-	-	0.042	-	0.014	-	-	-	-	-	0.048	0.098	-	-	-	-	0.040	-	-	-	-
Xylenes, Total	mg/kg	-	-	-	-	0.19	-	0.043	-	-	-	-	-	0.21	0.44	-	-	-	-	0.17	-	-	-	-
o-Xylene	mg/kg	-	-	-	-	0.055	-	-	-	-	-	-	-	0.067	0.12	-	-	-	-	0.049	-	-	-	-
Styrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg	-	-	-	-	0.13	-	0.043	-	-	-	-	-	0.14	0.32	-	-	-	-	0.12	-	-	-	-
1,2,3-Trichlorobenzene	mg/kg	-	-	-	-	0.037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit																								
Location		K19-TP17-44	K19-TP17-44	K19-TP17-44	K19-TP17-44	K19-TP17-44	K19-TP17-45	K19-TP17-45	K19-TP17-45	K19-TP17-46	K19-TP17-46	K19-TP17-47	K19-TP17-47	K19-TP17-48	K19-TP17-48	K19-TP17-49	K19-TP17-49	K19-TP17-49	K19-TP17-50	K19-TP17-50	K19-TP17-50	K19A-09MW-01	K19A-09MW-01	K19A-09MW-01
Sample Name		03359-10	03359-11	03365-10	03365-11	03365-12	06685-01	06685-02	06685-04	06685-07	06685-11	06686-01	06686-02	06686-06	06686-12	06688-02	06688-03	06688-06	06688-07	06688-09	06688-12			
Sample Date		1/29/2017	1/29/2017	1/29/2017	1/29/2017	1/29/2017	1/30/2017	1/30/2017	1/30/2017	1/30/2017	1/30/2017	1/30/2017	1/30/2017	1/30/2017	1/30/2017	1/30/2017	1/30/2017	1/30/2017	1/30/2017	1/30/2017	1/30/2017	10/20/2009	10/22/2009	10/22/2009
Sample Depth		3.4-3.4 m	4.2-4.2 m	0.7-0.7 m	1.7-1.7 m	1.7-1.7 m	0.6-0.6 m	0.6-0.6 m	2.5-2.5 m	0.7-0.7 m	3.4-3.4 m	0.6-0.6 m	1.6-1.6 m	0.7-0.7 m	4.9-4.9 m	1.4-1.4 m	2.4-2.4 m	4.1-4.1 m	0.6-0.6 m	2.4-2.4 m	5.1-5.1 m	2.4-3 m	9.1-9.8 m	9.1-9.8 m
SYS_SAMPLE_CODE		QM7262	QM7263	QM7329	QM7330	QM7331	QN1549	QN1550	QN1552	QN1555	QN1559	QN1567	QN1568	QN1572	QN1578	QN1581	QN1582	QN1585	QN1586	QN1588	QN1591	K19A-09BH-01-4	09-DUP-03	K19A-09BH-01-8
PARENT_SAMPLE_CODE						QM7330		QN1549															K19a-09BH-01-8	
SAMPLE_TYPE_CODE		N	N	N	N	FD	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N
FIELD_SDG		B708210	B708210	B708210	B708210	B708210	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B709132			
PAH																								
Acenaphthene	mg/kg	0.0094	-	-	-	-	-	-	0.0077	-	0.019	-	-	-	0.029	-	0.059	0.040	-	0.017	0.031	0.14	-	-
Acenaphthylene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.29	-	-
Benzo(a)anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.13	-	-
Benzo(a)pyrene	mg/kg	0.022	-	-	-	-	-	-	-	-	-	-	-	-	0.020	-	-	0.022	-	-	0.021	-	-	-
Benzo(b)fluoranthene	mg/kg	0.053	-	-	0.024	0.022	-	-	0.047	-	0.038	-	0.033	-	0.051	-	0.023	0.044	-	0.033	0.057	0.08	-	-
Benzo(g,h,i)perylene	mg/kg	0.13	-	-	-	-	-	-	-	-	0.069	-	-	-	0.11	-	-	0.098	-	0.054	0.13	0.09	-	-
Benzo(k)fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.06	-	-
Chrysene	mg/kg	0.053	-	-	-	-	-	-	0.028	-	0.026	-	-	-	0.069	-	-	0.031	-	0.021	0.047	0.18	-	-
Dibenzo(a,h)anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg	0.040	-	-	-	-	-	-	-	-	0.032	-	-	-	0.025	-	-	0.039	-	-	0.031	-	-	-
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg	0.059	-	-	0.042	0.042	-	-	0.045	-	0.044	-	0.043	0.041	0.056	-	0.042	0.057	-	0.044	0.058	-	-	-
Benzo(b,j) fluoranthene	mg/kg	0.053	-	-	0.024	0.022	-	-	0.047	-	0.038	-	0.033	-	0.051	-	0.023	0.044	-	0.033	0.057	-	-	-
Fluorene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.18	0.15	-	-	0.023	0.28	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	0.018	-	-	-	-	-	-	-	-	0.019	-	-	0.015	-	-	0.029	0.49	-	-	0.012	-	-	-
Phenanthrene	mg/kg	0.094	-	-	0.028	0.026	-	-	0.066	-	0.21	-	0.027	-	0.11	-	0.16	0.33	-	0.049	0.16	0.41	-	-
Pyrene	mg/kg	0.080	-	-	-	-	-	-	0.021	-	0.052	-	-	-	0.058	-	-	0.058	-	0.023	0.072	-	-	-
2-methylnaphthalene	mg/kg	0.054	-	-	-	-	-	-	0.024	-	0.12	-	-	0.042	0.030	-	0.14	0.91	-	0.026	0.038	-	-	-
PAH, Low Molecular Weight	mg/kg	0.18	-	-	-	-	-	-	0.098	-	0.37	-	-	0.057	0.17	-	0.56	1.9	-	0.092	0.27	1.12	-	-
PAH, High Molecular Weight	mg/kg	0.37	-	-	-	-	-	-	0.096	-	0.22	-	-	-	0.33	-	-	0.29	-	0.13	0.35	0.54	-	-
PAH, Total	mg/kg	0.55	-	-	0.052	-	-	-	0.19	-	0.59	-	0.059	0.057	0.50	-	0.59	2.2	-	0.22	0.62	1.66	-	-
EPH (C10-C19)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	190	-	430	140	-	-	250	1100	-	-
LEPH (C10-C19) Less PAHs	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	190	-	430	140	-	-	250	1100	-	-
EPH (C19-C32)	mg/kg	140	-	-	-	-	-	-	-	-	-	-	-	-	310	-	-	-	-	140	340	390	-	-
HEPH (C19-C32) Less PAHs	mg/kg	140	-	-	-	-	-	-	-	-	-	-	-	-	310	-	-	-	-	140	340	390	-	-
VPH (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	-	-	-	-	-	-
VHC (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	13	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	12	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	16	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																								
Bromodichloromethane (BDCM)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	0.0081	0.0097	-	-	-	-	0.0061	0.033	-	-	-
Toluene	mg/kg	-	-	-	-	-	-	-	0.24	-	-	-	-	0.62	0.31	-	-	0.024	-	0.21	3.8	-	-	-
Ethylbenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.023	0.081	-	-	0.012	-	-	-
Xylenes, Total	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.34	-	-	-	-	-	-
o-Xylene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.11	-	-	-	-	-	-
Styrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.23	-	-	-	-	-	-
1,2,3-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit																							
Location		K19A-09MW-02	K19A-09MW-02	K19A-09MW-02	K19A-09MW-03	K19A-09MW-03	K19A-09MW-03	K19A-09MW-04	K19A-09MW-04	K19A-09MW-04	K19A-09MW-05	K19A-09MW-05	K19A-09MW-05	K19A-09MW-05	K19A-09MW-06	K19A-09MW-06	K19A-09MW-06	K19A-09MW-06	K19A-09MW-07	K19A-09MW-07	K19A-09MW-08	K19A-09MW-08	K19A-09MW-08	K19A-09MW-09
Sample Name																								
Sample Date		10/20/2009	10/22/2009	10/22/2009	10/20/2009	10/22/2009	10/22/2009	10/20/2009	10/21/2009	10/21/2009	10/21/2009	10/21/2009	10/21/2009	10/21/2009	10/22/2009	10/22/2009	10/22/2009	10/22/2009	10/22/2009	10/22/2009	10/22/2009	10/22/2009	10/22/2009	10/22/2009
Sample Depth		0.6-1.2 m	7.6-8.2 m	8.2-9.1 m	0-0.6 m	2.4-3 m	4.3-4.9 m	1.8-2.4 m	1.8-2.4 m	6.7-7.9 m	0-0.6 m	0-0.6 m	1.8-2.4 m	6.4-7 m	0.6-1.2 m	2.7-3.7 m	5.8-6.4 m	6.7-7.3 m	0-0.6 m	1.2-2.4 m	0.6-1.2 m	5.5-6.1 m	6.7-7.3 m	0.6-1.2 m
SYS_SAMPLE_CODE		K19A-09BH-02-2	K19A-09BH-02-8	K19A-09BH-02-9	K19A-09BH-03-1	K19A-09BH-03-4	K19A-09BH-03-6	K19A-09BH-04-3	09-DUP-01	K19A-09BH-04-7	09-DUP-02	K19A-09BH-05-1	K19A-09BH-05-4	K19A-09BH-05-8	K19A-09BH-06-2	K19A-09BH-06-4	K19A-09BH-06-6	K19A-09BH-06-8	K19A-09BH-07-1	K19A-09BH-07-3	K19A-09BH-08-2	K19A-09BH-08-7	K19A-09BH-08-8	K19A-09BH-09-2
PARENT_SAMPLE_CODE									K19a-09BH-04-3		K19a-09BH-05-1													
SAMPLE_TYPE_CODE		N	N	N	N	N	N	N	FD	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N
FIELD_SDG																								
PAH																								
Acenaphthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	0.35	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	0.14	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg	0.08	-	-	-	-	-	0.09	-	0.06	-	-	-	0.08	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	mg/kg	-	-	-	-	-	-	-	-	0.09	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j) fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	mg/kg	-	-	-	-	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	-	-	-	-	-	-	-	-	0.17	-	-	-	0.16	-	-	-	-	-	-	-	-	-	-
Phenanthrene	mg/kg	0.1	-	-	-	-	-	0.09	0.08	0.27	-	-	0.07	-	-	-	-	-	-	-	-	-	-	-
Pyrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	0.06	-	-	-	-	-	-	-	-	-	-
2-methylnaphthalene	mg/kg	-	-	-	-	-	-	0.09	-	0.57	-	-	-	0.62	-	-	-	-	-	-	-	-	-	-
PAH, Low Molecular Weight	mg/kg	0.1	-	-	-	-	-	0.18	0.08	1.11	-	-	0.07	1.28	-	-	-	-	-	-	-	-	-	-
PAH, High Molecular Weight	mg/kg	0.14	-	-	-	-	-	0.09	-	0.2	-	-	-	0.24	-	-	-	-	-	-	-	-	-	-
PAH, Total	mg/kg	0.24	-	-	-	-	-	0.27	0.08	1.3	-	-	0.07	1.52	-	-	-	-	-	-	-	-	-	-
EPH (C10-C19)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEPH (C10-C19) Less PAHs	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	mg/kg	320	-	-	-	-	-	-	-	320	930	710	510	370	310	390	-	390	-	-	-	-	-	-
HEPH (C19-C32) Less PAHs	mg/kg	320	-	-	-	-	-	-	-	320	930	710	510	370	-	-	-	-	-	-	-	-	-	-
VPH (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VHC (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																								
Bromodichloromethane (BDCM)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit																								
Location		K19A-09MW-09	K19A-09MW-09	K19A-09MW-10	K19A-09MW-10	K19A-09MW-10	K19A-09MW-11	K19A-09MW-11	K19A-09MW-11	K19A-10BH-01	K19A-10BH-01	K19A-10BH-08	K19A-10BH-11	K19A-10BH-11	K19A-10BH-11	K19A-10BH-11	K19A-10BH-11	K19A-10BH-11	K19A-10BH-23	K19A-10MW-02	K19A-10MW-02	K19A-10MW-03	K19A-10MW-03	K19A-10MW-04
Sample Name		-	-	-	-	-	-	-	-	K19A-10BH-01-7	K19A-10BH-01-8	K19A-10BH-08-3	K19A-10BH-11-1	K19A-10BH-11-4	K19A-10BH-11-5	K19A-10BH-11-7	K19A-10BH-11-8	K19-DUP-6	K19A-10BH-23-6	K19A-10MW-02-2	K19A-10MW-02-5	K19A-10MW-03-2	K19A-10MW-DUP-1	K19A-10MW-04-4
Sample Date		10/22/2009	10/22/2009	10/22/2009	10/22/2009	10/22/2009	10/24/2009	10/24/2009	10/24/2009	8/12/2010	8/12/2010	8/15/2010	8/17/2010	8/17/2010	8/17/2010	8/17/2010	8/17/2010	8/17/2010	8/23/2010	8/13/2010	8/13/2010	8/13/2010	8/13/2010	8/14/2010
Sample Depth		6.7-7.3 m	7.3-8.2 m	0-0.6 m	3.7-4.3 m	4.9-5.5 m	1.8-2.4 m	3-3.7 m	3-3.7 m	3.88-3.96 m	2.9-3.05 m	2.1-2.4 m	0.3-0.6 m	2.4-2.7 m	3.05-3.35 m	3.8-3.95 m	3.95-4.1 m	2.4-2.7 m	2.6-2.74 m	1.52-2.13 m	3.84-3.99 m	1.22-1.52 m	1.22-1.52 m	2.6-2.75 m
SYS_SAMPLE_CODE		K19A-09BH-09-8	K19A-09BH-09-9	K19A-09BH-10-1	K19A-09BH-10-5	K19A-09BH-10-6	K19A-09BH-11-3	09-DUP-04	K19A-09BH-11-4	W20888	W20889	W32109	W31214	W31217	W31218	W31220	W31221	W31223	W49067	W32455	W32458	W32462	W32490	W32038
PARENT_SAMPLE_CODE								K19a-09BH-11-4										W31217					W32462	
SAMPLE_TYPE_CODE		N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	FD	N
FIELD_SDG										B071276	B071276	B073313	B073093	B073093	B073093	B073093	B073093	B073093	B076441	B073372	B073372	B073372	B073372	B073302
PAH																								
Acenaphthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.70	-	-	-	-
Acenaphthylene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.026	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.031	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	-	-	-	-	-	-	-	-	-	0.053	-	-	0.059	-	0.19	-	-	0.058	0.044	-	-	-	-
Benzo(k)fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg	-	-	-	-	-	-	-	-	-	0.072	-	-	0.017	-	0.041	-	-	0.079	0.055	-	-	-	-
Dibenzo(a,h)anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	0.015	-	-	0.015	-	0.055	-	-	0.017	0.033	-	-	-	-
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j) fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	0.035	-	-	0.042	-	0.075	-	-	0.055	0.030	-	-	-	-
Fluorene	mg/kg	-	-	-	-	-	-	-	-	-	0.25	-	-	-	-	-	-	-	-	2.2	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.022	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	0.015	-	0.55	-	-	0.031	18	-	-	-	-
Phenanthrene	mg/kg	-	-	-	-	-	-	-	-	-	0.41	-	-	0.066	-	0.51	-	-	0.071	2.0	-	-	-	-
Pyrene	mg/kg	-	-	-	-	-	-	-	-	-	0.028	-	-	0.018	-	0.084	-	-	0.028	0.062	-	-	-	-
2-methylnaphthalene	mg/kg	-	-	-	-	-	-	-	-	-	0.33	-	-	0.017	-	0.64	-	-	0.028	62	-	-	-	-
PAH, Low Molecular Weight	mg/kg	-	-	-	-	-	-	-	-	-	0.99	-	-	0.098	-	1.7	-	-	0.13	85	-	-	-	-
PAH, High Molecular Weight	mg/kg	-	-	-	-	-	-	-	-	-	0.20	-	-	0.15	-	0.53	-	-	0.24	0.22	-	-	-	-
PAH, Total	mg/kg	-	-	-	-	-	-	-	-	-	1.2	-	-	0.25	-	2.2	-	-	0.37	86	-	-	-	-
EPH (C10-C19)	mg/kg	-	-	-	-	-	-	730	350	-	1490	-	-	-	397	281	-	-	-	8320	1370	-	-	-
LEPH (C10-C19) Less PAHs	mg/kg	-	-	-	-	-	-	-	-	-	1490	-	-	-	-	280	-	-	-	8300	-	-	-	-
EPH (C19-C32)	mg/kg	-	350	360	-	-	-	-	-	-	113	-	-	-	-	-	-	-	-	397	471	-	-	-
HEPH (C19-C32) Less PAHs	mg/kg	-	-	-	-	-	-	-	-	-	113	-	-	-	-	-	-	-	-	397	-	-	-	-
VPH (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	49	53	-	-	-	24	32	19	-	-	-	28	-	-	-
VHC (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	49	53	-	-	-	24	33	19	-	-	-	28	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																								
Bromodichloromethane (BDCM)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.20	-	-	-	-	-	-	-	-
Toluene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	-	-	-	-	-	-	-	-	0.059	0.034	-	-	-	0.11	0.23	0.028	-	-	-	0.031	-	-	-
Xylenes, Total	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0.18	0.16	0.049	-	-	-	-	-	-	-
o-Xylene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0.18	0.16	0.049	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit																								
Location		K19A-10MW-04	K19A-10MW-04	K19A-10MW-05	K19A-10MW-05	K19A-10MW-06	K19A-10MW-07	K19A-10MW-07	K19A-10MW-09	K19A-10MW-09	K19A-10MW-10	K19A-10MW-10	K19A-10MW-19	K19A-10MW-19	K19A-10MW-19	K19A-10MW-20	K19A-10MW-20	K19A-10MW-20	K19A-10MW-20	K19A-10MW-21	K19A-10MW-21	K19A-10MW-21	K19A-10MW-21	K19A-10MW-22
Sample Name		K19A-10MW-04-6	K19A-10MW-04-7	K19A-10MW-05-3	K19-DUP-2	K19A-10MW-06-4	K19A-10MW-07-3	K19A-10MW-DUP-3	K19A-10MW-09-4	K19A-DUP-4	K19A-10MW-10-2	K19A-10MW-10-5	K19A-10MW-19-3	K19A-10MW-19-5	K19A-10MW-19-7	K19A-10MW-20-3	K19A-10MW-20-5	K19A-10MW-20-6	K19-DUP-11	K19A-10MW-21-4	K19A-10MW-21-6	K19A-10MW-21-7	K19-DUP-12	K19A-10MW-22-1
Sample Date		8/14/2010	8/14/2010	8/14/2010	8/14/2010	8/15/2010	8/15/2010	8/15/2010	8/16/2010	8/16/2010	8/16/2010	8/16/2010	8/20/2010	8/21/2010	8/21/2010	8/21/2010	8/21/2010	8/21/2010	8/21/2010	8/22/2010	8/22/2010	8/22/2010	8/22/2010	8/22/2010
Sample Depth		3.8-4 m	4.6-4.8 m	2.4-2.7 m	2.4-2.7 m	3.05-3.35 m	2.6-2.9 m	2.6-2.9 m	2.3-2.6 m	2.3-2.6 m	0.9-1.4 m	2.6-2.9 m	1.5-2.15 m	2.6-2.9 m	3.95-4.25 m	1.65-1.8 m	3.05-3.2 m	4.1-4.4 m	4.1-4.4 m	2.45-2.75 m	3.5-3.65 m	3.8-3.95 m	2.45-2.75 m	0.1-0.45 m
SYS_SAMPLE_CODE		W32040	W32041	W32044	W32056	W32095	W32099	W32102	W31964	W31920	W31923	W31928	W48630	W48618	W48620	W48623	W48625	W48626	W48627	W48635	W48637	W48638	W48646	W48640
PARENT_SAMPLE_CODE					W32044			W32099		W31964									W48626				W48635	
SAMPLE_TYPE_CODE		N	N	N	FD	N	N	FD	N	FD	N	N	N	N	N	N	N	N	FD	N	N	N	FD	N
FIELD_SDG		B073302	B073302	B073302	B073302	B073313	B073313	B073313	B073270	B073270	B073270	B073270	B076365	B076365	B076365	B076365	B076365	B076365	B076365	B076365	B076365	B076365	B076365	B076365
PAH																								
Acenaphthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.13	0.22	-	-	-	-	-	-	-
Acenaphthylene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	0.028	-	0.012	0.034	-	0.022	0.034	0.039	-	-	0.042	-	-
Benzo(a)pyrene	mg/kg	0.013	-	-	-	-	-	-	-	-	-	0.048	-	0.012	0.054	-	0.027	0.051	0.063	-	-	0.066	-	-
Benzo(b)fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	0.13	-	-	-	-	-	-	-	-	-	0.33	0.053	0.16	0.37	0.031	0.24	0.35	0.42	0.10	-	0.42	-	-
Benzo(k)fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	0.017	-	0.012	0.015	-	0.012	0.026	0.026	0.011	-	0.027	-	-
Chrysene	mg/kg	0.15	-	-	-	-	-	-	-	-	-	0.21	0.026	0.18	0.18	0.030	0.16	0.20	0.22	0.11	-	0.20	-	-
Dibenzo(a,h)anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	0.025	-	0.020	0.032	-	0.026	0.031	0.037	-	-	0.044	-	-
Fluoranthene	mg/kg	0.027	-	-	-	-	-	-	-	-	-	0.059	-	0.062	0.079	-	0.056	0.074	0.080	0.021	-	0.069	-	-
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j) fluoranthene	mg/kg	0.069	-	-	-	-	-	-	-	-	-	0.097	0.031	0.088	0.098	0.027	0.095	0.10	0.12	0.065	-	0.12	-	-
Fluorene	mg/kg	0.075	-	-	-	-	-	-	-	-	-	0.39	-	0.15	0.017	0.28	0.63	-	-	-	-	0.021	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg	-	-	-	-	-	-	-	-	-	-	0.036	-	0.021	0.036	-	0.030	0.035	0.043	-	-	0.051	-	-
Naphthalene	mg/kg	-	-	-	-	-	-	-	-	-	-	1.9	0.025	0.31	0.28	3.5	7.9	0.17	0.27	0.022	-	0.25	-	-
Phenanthrene	mg/kg	0.29	-	-	-	-	-	-	-	-	-	0.78	0.033	0.55	0.65	0.21	0.66	0.66	0.77	0.082	-	0.66	-	-
Pyrene	mg/kg	0.069	-	-	-	-	-	-	-	-	-	0.14	-	0.047	0.12	0.012	0.070	0.12	0.14	0.022	-	0.13	-	-
2-methylnaphthalene	mg/kg	0.17	-	-	-	-	-	-	-	-	-	6.0	0.051	0.87	1.0	0.99	4.0	0.39	0.63	0.023	-	0.67	-	-
PAH, Low Molecular Weight	mg/kg	0.54	-	-	-	-	-	-	-	-	-	9.0	0.11	1.9	2.0	5.1	13	1.2	1.7	0.13	-	1.6	-	-
PAH, High Molecular Weight	mg/kg	0.46	-	-	-	-	-	-	-	-	-	0.98	0.11	0.62	1.0	0.10	0.74	1.0	1.2	0.33	-	1.2	-	-
PAH, Total	mg/kg	0.99	-	-	-	-	-	-	-	-	-	10	0.22	2.5	3.0	5.2	14	2.2	2.9	0.45	-	2.8	-	-
EPH (C10-C19)	mg/kg	314	-	-	-	-	-	-	-	-	-	1130	-	257	-	1290	1320	-	-	-	497	-	-	-
LEPH (C10-C19) Less PAHs	mg/kg	314	-	-	-	-	-	-	-	-	-	1130	-	256	-	1290	1310	-	-	-	-	-	-	-
EPH (C19-C32)	mg/kg	153	-	-	-	-	111	116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HEPH (C19-C32) Less PAHs	mg/kg	152	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH (C6-C10)	mg/kg	20	29	-	-	-	-	-	-	-	470	390	-	-	-	-	-	-	-	-	-	-	-	-
VHC (C6-C10)	mg/kg	20	29	-	-	-	-	-	-	-	480	400	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																								
Bromodichloromethane (BDCM)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.18
1,1,2-trichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg	0.012	0.0097	-	-	-	-	-	-	0.0086	-	0.33	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	-	-	-	-	-	-	-	-	-	0.32	1.8	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	0.020	-	-	-	-	-	-	-	-	0.87	1.2	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total	mg/kg	-	-	-	-	-	-	-	-	-	6.0	8.4	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/kg	-	-	-	-	-	-	-	-	-	0.38	2.7	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg	-	-	-	-	-	-	-	-	-	5.6	5.7	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit																								
Location		K19A-10MW-22	K19A-10MW-22	K19A-10MW-22	K19A-10MW-24	K19A-10MW-24	K19A-10MW-24	K19A-10MW-24	K19A-10MW-25	K19A-10MW-26	K19A-10MW-26	K19A-10MW-26	K19A-10MW-27	K19A-10MW-28	K19A-10MW-28	K19A-10MW-28	K19A-10MW-28	K19B-09MW-01	K19B-09MW-01	K19B-09MW-02	K19B-09MW-02	K19B-09MW-03	K19B-09MW-03	K19B-09MW-03
Sample Name		K19A-10MW-22-3	K19A-10MW-22-6	K19-DUP-13	K19A-10MW-24-1	K19A-10MW-24-5	K19A-10MW-24-6	K19A-DUP-14	K19A-10MW-25-4	K19A-10MW-26-4	K19A-10MW-26-6	K19A-10MW-26-7	K19A-10MW-27-3	K19A-10MW-28-1	K19A-10MW-28-3	K19A-10MW-28-6	K19-DUP-16							
Sample Date		8/22/2010	8/22/2010	8/22/2010	8/24/2010	8/24/2010	8/24/2010	8/24/2010	8/24/2010	8/25/2010	8/25/2010	8/25/2010	8/25/2010	8/25/2010	8/25/2010	8/25/2010	8/25/2010	10/24/2009	10/24/2009	10/24/2009	10/24/2009	10/26/2009	10/26/2009	10/26/2009
Sample Depth		1.2-1.5 m	3.95-4.25 m	1.2-1.5 m	0.31-0.61 m	2.44-2.74 m	3.05-3.35 m	3.05-3.35 m	2.44-2.92 m	1.5-1.8 m	2.3-2.6 m	2.6-2.9 m	1.7-2.15 m	0.15-0.6 m	1.5-1.8 m	3.8-3.95 m	0.15-0.6 m	0-0.6 m	3-3.7 m	0.6-1.2 m	4.9-5.5 m	0.6-1.2 m	7.3-7.6 m	7.3-7.6 m
SYS_SAMPLE_CODE		W48642	W48645	W48647	W49069	W49073	W49074	W49075	W49078	W54440	W54442	W54443	W54446	W54463	W54465	W54468	W54462	K19B-09BH-01-1	K19B-09BH-01-4	K19B-09BH-02-2	K19B-09BH-02-6	K19B-09BH-03-2	09-DUP-05	K19B-09BH-03-8
PARENT_SAMPLE_CODE				W48642				W49074									W54463						K19b-09BH-03-8	
SAMPLE_TYPE_CODE		N	N	FD	N	N	N	FD	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	FD	N
FIELD_SDG		B076365	B076365	B076365	B076441	B076441	B076441	B076441	B076441	B077440	B077440	B077440	B077440	B077440	B077440	B077440	B077440							
PAH																								
Acenaphthene	mg/kg	0.027	0.014	-	-	-	-	0.038	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg	-	0.027	-	-	0.018	0.027	0.033	0.016	-	0.027	-	-	-	-	0.023	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg	-	0.050	-	-	0.017	0.037	0.048	0.025	-	0.037	-	-	-	-	0.051	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	0.023	0.30	-	-	0.19	0.26	0.27	0.18	-	0.22	-	0.047	-	0.087	0.40	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	-	0.021	-	-	0.016	0.020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg	0.016	0.12	-	-	0.15	0.17	0.13	0.14	-	0.12	-	0.021	-	0.026	0.088	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	mg/kg	-	0.021	-	-	-	0.026	0.032	-	-	-	-	-	-	-	0.035	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg	-	0.044	-	-	0.034	0.056	0.050	0.029	-	0.034	-	-	-	0.032	0.068	-	-	-	-	-	-	-	-
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j) fluoranthene	mg/kg	0.017	0.079	-	-	0.088	0.10	0.080	0.059	-	0.061	-	0.051	-	0.053	0.11	-	-	-	-	-	-	-	-
Fluorene	mg/kg	0.11	0.16	-	-	-	0.16	0.29	0.036	-	0.34	-	-	-	1.2	0.22	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg	-	0.033	-	-	0.021	0.033	0.038	-	-	0.024	-	-	-	-	0.038	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	-	0.23	-	-	0.053	0.19	0.37	0.016	-	2.8	-	0.027	-	30	-	-	-	-	-	-	-	-	-
Phenanthrene	mg/kg	0.15	0.43	-	-	0.18	0.50	0.52	0.18	-	0.59	-	0.051	-	1.4	0.57	-	-	-	-	-	-	-	-
Pyrene	mg/kg	-	0.092	-	-	0.049	0.098	0.099	0.086	-	0.085	-	0.011	-	0.035	0.14	-	-	-	-	-	-	-	-
2-methylnaphthalene	mg/kg	0.080	0.76	-	-	0.069	0.62	1.3	0.061	-	7.4	-	0.019	-	59	1.5	-	-	-	-	-	-	-	-
PAH, Low Molecular Weight	mg/kg	0.36	1.6	-	-	0.30	1.5	2.5	0.29	-	11	-	0.097	-	92	2.3	-	-	-	-	-	-	-	-
PAH, High Molecular Weight	mg/kg	0.056	0.78	-	-	0.58	0.82	0.79	0.54	-	0.61	-	0.13	-	0.23	0.95	-	-	-	-	-	-	-	-
PAH, Total	mg/kg	0.42	2.4	-	-	0.88	2.3	3.3	0.83	-	12	-	0.23	-	92	3.3	-	-	-	-	-	-	-	-
EPH (C10-C19)	mg/kg	659	-	-	-	-	1190	432	-	-	915	574	-	2020	4470	508	-	-	-	-	-	-	-	-
LEPH (C10-C19) Less PAHs	mg/kg	659	-	-	-	-	1190	431	-	-	911	-	-	-	4440	508	-	-	-	-	-	-	-	-
EPH (C19-C32)	mg/kg	-	-	-	-	-	111	100	-	-	129	127	-	-	203	130	-	580	-	430	-	-	-	-
HEPH (C19-C32) Less PAHs	mg/kg	-	-	-	-	-	111	100	-	-	128	-	-	-	203	129	-	-	-	-	-	-	-	-
VPH (C6-C10)	mg/kg	-	-	47	-	-	-	-	-	-	220	-	-	630	-	-	630	-	-	-	-	-	-	-
VHC (C6-C10)	mg/kg	-	-	47	-	-	-	-	-	-	260	-	-	660	-	-	650	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																								
Bromodichloromethane (BDCM)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg	-	-	-	-	-	-	-	-	-	0.89	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	-	-	-	-	-	-	-	-	-	6.0	-	-	1.3	-	-	1.1	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	-	-	0.042	-	-	-	-	-	-	3.7	-	-	0.050	-	-	-	-	-	-	-	-	-	-
Xylenes, Total	mg/kg	-	-	-	-	-	-	-	-	-	23	-	-	28	-	-	20	-	-	-	-	-	-	-
o-Xylene	mg/kg	-	-	-	-	-	-	-	-	-	5.7	-	-	12	-	-	8.0	-	-	-	-	-	-	-
Styrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg	-	-	-	-	-	-	-	-	-	17	-	-	16	-	-	12	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit																								
Location		K19B-09MW-04	K19B-09MW-04	K19B-09MW-04	K19B-09MW-05	K19B-09MW-05	K19B-09MW-05	K19B-09MW-06	K19B-09MW-06	K19B-09MW-06	K19B-09MW-07	K19B-09MW-07	K19B-09MW-07	K19B-10BH-17	K19B-10BH-17	K19B-10MW-12	K19B-10MW-12	K19B-10MW-12	K19B-10MW-15	K19B-10MW-15	K19B-10MW-15	K19B-10MW-16	K19B-10MW-18	K19B-10MW-18
Sample Name		-	-	-	-	-	-	-	-	-	-	-	-	K19B-10BH-17-2	K19B-10BH-17-5	K19B-10MW-12-1	K19B-10MW-12-5	K19-DUP-7	K19B-10MW-15-1	K19B-10MW-15-6	K19-DUP-9	K19B-10MW-16-5	K19B-10MW-18-5	K19-DUP-10
Sample Date		10/26/2009	10/26/2009	10/26/2009	10/26/2009	10/26/2009	10/26/2009	10/26/2009	10/26/2009	10/26/2009	10/26/2009	10/26/2009	10/26/2009	8/20/2010	8/20/2010	8/17/2010	8/17/2010	8/17/2010	8/19/2010	8/19/2010	8/19/2010	8/19/2010	8/20/2010	8/20/2010
Sample Depth		0-0.6 m	5.5-6.1 m	6.1-7 m	0.6-1.2 m	1.8-2.4 m	3-3.7 m	0.6-1.2 m	1.8-2.4 m	6.1-6.7 m	1.2-2.4 m	3-3.7 m	7.9-8.8 m	0.8-1.4 m	3.05-3.66 m	0.18-0.31 m	2.45-2.8 m	2.45-2.8 m	0.48-0.6 m	3.05-3.35 m	3.05-3.35 m	3.05-3.32 m	3-3.65 m	3-3.65 m
SYS_SAMPLE_CODE		K19-09BH-04-1	K19-09BH-04-6	K19-09BH-04-7	K19-09BH-05-2	K19-09BH-05-3	K19-09BH-05-4	K19-09BH-06-2	K19-09BH-06-3	K19-09BH-06-7	K19-09BH-07-3	K19-09BH-07-4	K19-09BH-07-8	W48608	W48611	W31225	W31229	W31231	W37318	W37323	W37329	W37328	W48616	W48631
PARENT_SAMPLE_CODE																		W31229			W37323			W48616
SAMPLE_TYPE_CODE		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	N	FD	N	N	FD
FIELD_SDG														B076365	B076365	B073095	B073095	B073095	B074322	B074322	B074322	B074322	B076365	B076365
PAH																								
Acenaphthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0.013	-	0.037	0.031	-	0.028	0.035	0.021	0.020	0.027
Benzo(a)pyrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0.012	-	0.046	0.041	-	0.035	0.056	0.023	0.019	0.039
Benzo(b)fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0.12	-	0.30	0.33	-	0.23	0.31	0.18	0.18	0.27
Benzo(k)fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.018	0.017	-	0.017	0.018	0.016	0.014	0.026
Chrysene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0.12	-	0.25	0.21	-	0.19	0.21	0.19	0.15	0.21
Dibenzo(a,h)anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.034	-	0.026	0.034	0.025	0.022	0.032
Fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0.030	-	0.073	0.064	-	0.058	0.067	0.055	0.038	0.050
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j) fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0.075	-	0.16	0.12	-	0.10	0.12	0.10	0.088	0.13
Fluorene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.030	0.036	-	0.029	0.037	0.022	0.022	0.033
Naphthalene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0.045	-	0.15	0.15	-	0.13	0.21	0.085	0.074	0.12
Phenanthrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0.15	-	0.43	0.40	-	0.47	0.63	0.46	0.20	0.33
Pyrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0.032	-	0.13	0.11	-	0.097	0.13	0.066	0.068	0.11
2-methylnaphthalene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0.053	-	0.30	0.28	-	0.25	0.51	0.11	0.14	0.23
PAH, Low Molecular Weight	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0.25	-	0.88	0.83	-	0.85	1.4	0.65	0.42	0.68
PAH, High Molecular Weight	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0.40	-	1.0	1.0	-	0.81	1.0	0.69	0.62	0.92
PAH, Total	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0.65	-	1.9	1.8	-	1.7	2.4	1.3	1.0	1.6
EPH (C10-C19)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	229	-	-	111	-	-	-	-	-	-	-
LEPH (C10-C19) Less PAHs	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	110	-	-	-	-	-	-	-
EPH (C19-C32)	mg/kg	-	360	320	-	360	320	-	-	-	-	590	330	-	-	-	136	-	-	-	-	-	-	-
HEPH (C19-C32) Less PAHs	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	135	-	-	-	-	-	-	-
VPH (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VHC (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																								
Bromodichloromethane (BDCM)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit	Location	K19-HA17-01-SA1	K19-HA17-01-SA2	K19-HA17-02	K19-HA17-03	K19-HA17-04	K19-HA17-04	K19-HA17-05	K19-HA17-06	K19-HA17-06	K19-HA17-07	K19-HA17-08	K19-HA17-08	K19-HD17-01	K19-HD17-02	K19-HD17-03	K19-HD17-04	K19-HD17-05	K19-HD17-06	K19-HD17-07	K19-MW17-17-SA4	K19-MW17-17-SA5	K19-MW17-17-SA6	K19-MW17-18-SA1
		Sample Name	03811-01	03811-04	03811-02	03811-03	03811-05	03811-06	03811-07	03845-01	03845-03	03606-01	03606-02	03606-03	03776-01	03776-02	03776-03	03776-04	03776-05	03776-06	03776-07	03831-04	03831-05	03831-06	03831-07
		Sample Date	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/23/2017	7/23/2017	7/29/2017	7/30/2017	7/30/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017	7/18/2017	7/18/2017	7/18/2017	7/19/2017
		Sample Depth	0.2-0.3 m	0.4-0.6 m	0.45-0.65 m	0.25-0.4 m	0.4-0.6 m	0.4-0.6 m	0.2-0.3 m	0.5-0.6 m	1.4-1.5 m	0.35-0.5 m	0.3-0.45 m	0.7-1.1 m	0.4-0.4 m	0.4-0.4 m	0.35-0.35 m	0.4-0.4 m	0.4-0.4 m	0.4-0.4 m	0.3-0.3 m	4.3-4.5 m	5.2-5.8 m	6.5-7 m	0.3-0.5 m
		SYS_SAMPLE_CODE	8582868-03811-01	8582879-03811-04	8582874-03811-02	8582877-03811-03	8582882-03811-05	8582883-03811-06	8582884-03811-07	8598960-03845-01	8598962-03845-03	8604446-03606-01	8604447-03606-02	8604449-03606-03	8565902-03776-01	8565909-03776-02	8565911-03776-03	8565912-03776-04	8565913-03776-05	8565914-03776-06	8565915-03776-07	8582992-03831-04	8582993-03831-05	8582994-03831-06	8582995-03831-07
		PARENT_SAMPLE_CODE						8582882-03811-05																	
		SAMPLE_TYPE_CODE	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
		FIELD_SDG	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N243343	17N243343	17N244304	17N244304	17N244304	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N240971	17N240971	17N240971	17N240971
PAH																									
Acenaphthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	0.009	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	0.006	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg		-	-	-	-	-	-	-	-	0.07	0.05	-	-	-	-	-	-	-	-	-	0.05	-	-	-
Benzo(g,h,i)perylene	mg/kg		-	-	-	-	-	-	-	-	0.13	0.05	-	0.08	-	-	-	-	-	-	-	0.09	0.09	0.09	-
Benzo(k)fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg		-	-	-	-	-	-	-	-	0.11	-	-	0.05	-	-	-	-	-	-	-	0.08	0.10	0.10	-
Dibenzo(a,h)anthracene	mg/kg		-	-	-	-	-	-	-	0.005	0.018	0.011	0.005	0.009	-	-	-	-	-	-	-	0.007	-	-	-
Fluoranthene	mg/kg		-	-	-	-	-	-	-	-	0.03	-	0.01	0.02	-	-	-	-	-	-	-	0.03	0.02	0.02	-
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j) fluoranthene	mg/kg		-	-	-	-	-	-	-	-	0.07	0.05	-	-	-	-	-	-	-	-	-	0.05	-	-	-
Fluorene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.03	0.03	-
Indeno(1,2,3-c,d)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg		-	-	-	-	-	-	-	-	-	0.009	0.039	0.017	-	0.005	0.005	-	-	-	-	0.010	-	0.029	-
Phenanthrene	mg/kg		-	-	-	-	-	-	-	-	0.06	0.03	0.04	0.06	-	-	0.02	0.04	-	-	-	0.08	0.29	0.19	-
Pyrene	mg/kg		-	-	-	-	-	-	-	-	0.02	-	0.01	0.02	-	0.01	-	0.05	-	-	-	0.07	0.05	0.05	-
2-methylnaphthalene	mg/kg		-	-	-	-	-	-	-	-	0.018	0.011	0.154	0.041	-	0.018	0.020	-	-	-	-	0.042	0.095	0.119	-
PAH, Low Molecular Weight	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, High Molecular Weight	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, Total	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C10-C19)	mg/kg		-	-	-	-	-	-	-	-	24	-	33	-	-	101	34	460	-	-	-	43	365	292	-
LEPH (C10-C19) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	mg/kg		-	-	-	-	-	-	-	30	64	22	129	44	120	289	283	684	-	-	-	76	438	417	-
HEPH (C19-C32) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VHC (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	30	63	21	128	44	120	289	282	684	-	-	-	76	438	417	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	24	-	33	-	-	101	34	460	-	-	-	43	365	292	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	-	-
Total Organic Carbon	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	-	-
1-Methylnaphthalene	ug/g		-	-	-	-	-	-	-	0.006	0.027	0.010	0.068	0.043	-	0.011	0.013	-	-	-	-	0.046	0.078	0.092	-
VOC																									
Bromodichloromethane (BDCM)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg		-	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg		-	-	-	-	-	-	-	0.006	0.027	0.010	0.068	0.043	-	0.011	0.013	-	-	-	-	0.046	0.078	0.092	-
Acetone	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit	Location	K19-MW17-18-SA1	K19-MW17-18-SA2	K19-MW17-18-SA4	K19-MW17-18-SA5	K19-MW17-18-SA7	K19-MW17-18-SA9	K19-MW17-19-SA1	K19-MW17-19-SA2	K19-MW17-19-SA4	K19-MW17-19-SA6	K19-MW17-20-SA1	K19-MW17-20-SA3	K19-MW17-20-SA5	K19-MW17-20-SA5	K19-MW17-21-SA4	K19-MW17-21-SA7	K19-MW17-22-SA3	K19-MW17-22-SA4	K19-MW17-22-SA4	K19-MW17-22-SA6	K19-MW17-22-SA7	K19-MW17-23-SA1	K19-MW17-23-SA3
		Sample Name	03831-08	03831-09	03831-10	03831-12	03832-02	03832-04	03832-05	03832-06	03832-08	03832-11	03833-01	03833-03	03833-05	03833-06	03833-10	03834-02	03834-05	03834-06	03834-07	03834-09	03834-10	03834-11	03835-01
		Sample Date	7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017
		Sample Depth	0.3-0.5 m	1.5-1.8 m	4.5-4.8 m	5.2-5.5 m	7.5-8.5 m	12-13 m	0.3-0.5 m	1.8-2.1 m	5-6 m	7-8 m	0.3-0.5 m	3-3.5 m	5.8-6.8 m	5.8-6.8 m	4.5-5 m	9-10 m	3-3.5 m	4.5-5 m	4.5-5 m	8-8.5 m	9-10 m	0.3-0.5 m	3-3.3 m
		SYS_SAMPLE_CODE	8582996-03831-08	8582998-03831-09	8582999-03831-10	8583001-03831-12	8583004-03832-02	8583006-03832-04	8583007-03832-05	8583009-03832-06	8583011-03832-08	8583016-03832-11	8590359-03833-01	8590368-03833-03	8590370-03833-05	8590372-03833-06	8590381-03833-10	8590417-03834-02	8590421-03834-05	8590423-03834-06	8590427-03834-07	8590432-03834-09	8590434-03834-10	8590436-03834-11	8590466-03835-01
		PARENT_SAMPLE_CODE	8582995-03831-07													8590370-03833-05					8590423-03834-06				
		SAMPLE_TYPE_CODE	FD	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	FD	N	N	N	N
		FIELD_SDG	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036
PAH																									
Acenaphthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg		-	-	-	-	-	-	-	0.109	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg		-	-	0.03	0.03	-	-	-	-	-	0.03	-	-	0.03	-	-	0.03	-	-	0.03	0.03	0.03	-	0.04
Benzo(b)fluoranthene	mg/kg		-	-	0.05	0.05	-	0.05	-	0.05	0.05	0.05	-	0.07	0.06	-	-	0.05	-	-	0.05	0.05	0.06	-	0.05
Benzo(g,h,i)perylene	mg/kg		-	-	0.16	0.15	0.09	0.10	-	0.07	0.12	0.12	-	0.11	0.15	0.13	0.09	0.13	0.11	0.10	0.17	0.13	0.14	-	0.15
Benzo(k)fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg		-	-	0.12	0.11	0.10	0.11	-	0.08	0.11	0.11	-	0.15	0.13	0.08	0.07	0.12	0.09	0.08	0.08	0.12	0.15	-	0.11
Dibenzo(a,h)anthracene	mg/kg		-	-	0.006	0.005	-	-	-	-	-	-	-	0.006	0.006	-	-	0.005	-	-	-	-	0.005	-	0.005
Fluoranthene	mg/kg		-	-	0.04	0.04	0.02	0.02	-	0.01	0.03	0.03	-	0.05	0.04	0.03	0.03	0.04	0.03	0.03	0.04	0.04	0.04	-	0.04
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg		-	-	0.05	0.05	-	-	-	-	-	-	-	-	0.05	-	-	0.05	-	-	-	-	0.05	-	0.06
Benzo(b,j) fluoranthene	mg/kg		-	-	0.05	0.05	-	0.05	-	0.05	0.05	0.05	-	0.07	0.06	-	-	0.05	-	-	0.05	0.05	0.06	-	0.05
Fluorene	mg/kg		-	-	-	-	0.05	0.10	-	-	0.16	-	-	-	0.2	-	-	0.2	-	-	-	0.2	0.2	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg		-	0.124	1.09	1.25	0.028	0.062	-	0.047	0.169	1.34	-	0.049	1.54	0.94	0.99	1.28	0.71	1.28	1.08	2.20	0.66	-	0.75
Phenanthrene	mg/kg		-	0.03	0.5	0.5	0.25	0.39	-	0.11	0.41	0.5	-	0.40	0.5	0.4	0.3	0.5	0.3	0.4	0.4	0.5	0.9	-	0.4
Pyrene	mg/kg		-	-	0.08	0.07	0.05	0.05	-	0.04	0.06	0.07	-	0.06	0.08	0.06	0.05	0.08	0.06	0.06	0.07	0.08	0.09	-	0.08
2-methylnaphthalene	mg/kg		-	0.685	2.15	2.21	0.095	0.402	-	0.094	0.870	2.40	-	0.181	2.74	1.72	1.58	2.43	1.41	1.93	1.62	3.03	2.51	-	1.55
PAH, Low Molecular Weight	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, High Molecular Weight	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, Total	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C10-C19)	mg/kg		-	157	101	100	398	262	-	119	74	64	-	57	124	81	68	106	75	75	77	125	143	-	74
LEPH (C10-C19) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	mg/kg		-	24	100	100	470	349	-	156	100	68	-	76	121	72	68	95	81	73	76	118	126	-	78
HEPH (C19-C32) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VHC (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	24	100	100	470	349	-	156	100	68	-	76	121	72	68	95	81	73	76	118	125	-	78
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	156	100	98	398	262	-	119	74	62	-	57	122	80	66	105	74	73	75	122	141	-	73
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		-	-	38	-	21	22	-	-	50	57	-	-	32|32	59	32|32	56	-	38|38	-	-	82|82	-	38|38
Total Organic Carbon	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g		-	-	38	-	21	22	-	-	50	59	-	-	33|33	60	33|33	58	-	40|40	-	-	83|83	-	38|38
1-Methylnaphthalene	ug/g		-	0.478	1.47	1.52	0.080	0.270	-	0.089	0.541	1.59	-	0.148	1.88	1.20	1.10	1.65	0.97	1.34	1.15	2.11	1.63	-	1.12
VOC																									
Bromodichloromethane (BDCM)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	0.11	0.09	0.06	0.13	-	0.20	-	-	0.08	-	-
Ethylbenzene	mg/kg		-	-	0.10	-	-	-	-	-	-	0.30	-	-	0.22	0.23	0.23	0.44	-	0.38	-	-	0.29	-	0.14
Xylenes, Total	mg/kg		-	-	0.5	-	-	-	-	-	-	2.2	-	-	1.0	1.0|1.0	1.0	1.9|1.9	-	1.6	-	-	1.3	-	0.6
o-Xylene	mg/kg		-	-	0.15	-	-	-	-	-	0.07	0.81	-	-	0.31	0.33	0.31	0.60	-	0.50	-	-	0.41	-	0.19
Styrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg		-	-	0.33	-	-	-	-	-	0.07	1.36	-	-	0.66	0.71	0.66	1.30	-	1.05	-	-	0.93	-	0.44
1,2,3-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg		-	0.478	1.47	1.52	0.080	0.270	-	0.089	0.541	1.59	-	0.148	1.88	1.20	1.10	1.65	0.97	1.34	1.15	2.11	1.63	-	1.12
Acetone	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit	Location	K19-MW17-23-SA4	K19-MW17-23-SA6	K19-MW17-24-SA1	K19-MW17-24-SA3	K19-MW17-24-SA4	K19-MW17-25-SA1	K19-MW17-25-SA3	K19-MW17-25-SA4	K19-MW17-25-SA5	K19-MW17-26-SA1	K19-MW17-26-SA3	K19-MW17-26-SA4	K19-MW17-26-SA5	K19-MW17-26-SA7	K19-MW17-26-SA8	K19-MW17-27-SA1	K19-MW17-27-SA4	K19-MW17-27-SA5	K19-MW17-27-SA7	K19-MW17-28-SA1	K19-MW17-28-SA1	K19-MW17-28-SA4	K19-MW17-28-SA6
		Sample Name	03835-02	03835-04	03835-08	03835-10	03835-12	03836-01	03836-03	03836-04	03836-05	03836-06	03836-08	03836-09	03836-10	03836-12	03837-01	03837-02	03837-05	03837-06	03837-08	03837-09	03837-10	03838-01	03838-03
		Sample Date	7/21/2017	7/21/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/23/2017	7/23/2017	7/23/2017	7/23/2017	7/23/2017	7/23/2017	7/23/2017	7/23/2017
		Sample Depth	4.5-5 m	8-8.5 m	0.3-0.5 m	3-3.5 m	4.7-5.2 m	0.3-0.5 m	3-3.5 m	4.5-5 m	6-6.5 m	0.3-0.5 m	3.5-4 m	3.5-4 m	5-5.5 m	8-8.8 m	11-11.8 m	0.3-0.5 m	4.5-5 m	6-6.5 m	8-8.75 m	0.3-0.5 m	0.3-0.5 m	5-5.5 m	8-8.5 m
		SYS_SAMPLE_CODE	8590469-03835-02	8590477-03835-04	8590480-03835-08	8590483-03835-10	8590485-03835-12	8598920-03836-01	8598922-03836-03	8598923-03836-04	8598924-03836-05	8598925-03836-06	8598927-03836-08	8598928-03836-09	8598929-03836-10	8598931-03836-12	8598932-03837-01	8598933-03837-02	8598936-03837-05	8598937-03837-06	8598939-03837-08	8598940-03837-09	8598941-03837-10	8598944-03838-01	8598946-03838-03
		PARENT_SAMPLE_CODE												8598927-03836-08									8598940-03837-09		
		SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	FD	N	N
		FIELD_SDG	17N242036	17N242036	17N242036	17N242036	17N242036	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343
PAH																									
Acenaphthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg		0.03	-	-	0.04	0.03	-	-	-	-	-	0.03	0.04	0.03	-	0.03	-	0.03	-	0.04	-	-	-	-
Benzo(b)fluoranthene	mg/kg		0.05	-	-	0.06	0.05	-	-	-	-	-	0.05	0.05	0.05	-	0.06	-	0.05	-	0.07	-	-	-	0.05
Benzo(g,h,i)perylene	mg/kg		0.15	0.09	-	0.19	0.20	-	-	0.16	-	-	0.26	0.29	0.21	0.13	0.25	-	0.20	-	0.30	-	-	0.12	0.16
Benzo(k)fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg		0.11	0.07	-	0.12	0.11	-	-	0.08	-	-	0.11	0.12	0.10	0.08	0.15	-	0.12	-	0.18	-	-	0.08	0.13
Dibenzo(a,h)anthracene	mg/kg		-	-	-	0.006	-	-	-	0.006	-	-	0.009	0.010	0.009	0.006	-	-	0.010	-	0.011	-	-	0.007	0.006
Fluoranthene	mg/kg		0.05	0.03	-	0.05	0.05	-	-	0.03	-	-	0.05	0.06	0.04	0.03	0.04	-	0.05	-	0.07	-	-	0.02	0.02
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg		-	-	-	0.06	-	-	-	-	-	-	0.05	0.06	0.05	-	0.05	-	0.05	-	0.07	-	-	-	-
Benzo(b,j) fluoranthene	mg/kg		0.05	-	-	0.06	0.05	-	-	-	-	-	0.05	0.05	0.05	-	0.06	-	0.05	-	0.07	-	-	-	0.05
Fluorene	mg/kg		0.2	-	-	-	0.19	-	-	0.07	-	-	0.16	0.18	0.16	0.14	0.27	-	0.22	-	0.30	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	0.02	-	-	-	-	-	-	0.02	-	-	-	-
Naphthalene	mg/kg		1.46	0.92	-	0.46	0.841	-	-	0.19	-	-	0.59	0.52	0.71	1.00	1.39	-	0.98	-	1.32	-	-	0.014	0.044
Phenanthrene	mg/kg		0.5	0.3	-	0.4	0.51	-	-	0.33	-	-	0.47	0.52	0.44	0.38	0.70	-	0.54	-	0.80	-	-	0.20	0.17
Pyrene	mg/kg		0.08	0.05	-	0.09	0.09	-	-	0.06	-	-	0.09	0.10	0.07	0.05	0.09	-	0.08	-	0.13	-	-	0.05	0.06
2-methylnaphthalene	mg/kg		2.29	1.38	-	1.17	1.56	-	-	0.59	-	-	1.30	1.24	1.26	1.38	2.59	-	1.69	-	2.60	-	-	-	-
PAH, Low Molecular Weight	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, High Molecular Weight	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, Total	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C10-C19)	mg/kg		94	68	-	87	79	-	-	48	-	-	83	80	69	46	110	-	62	-	114	-	-	216	245
LEPH (C10-C19) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	mg/kg		91	65	-	91	76	-	-	56	-	-	82	80	70	40	88	-	55	-	106	-	-	353	427
HEPH (C19-C32) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VHC (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		91	64	-	90	76	-	-	56	-	-	81	80	70	40	87	-	55	-	106	-	-	353	427
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		92	66	-	86	78	-	-	47	-	-	82	79	68	44	108	-	60	-	112	-	-	216	244
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		-	29	-	-	37|37	-	-	-	26|26	-	20|20	19	-	45	64	-	-	15|15	52|52	-	-	-	-
Total Organic Carbon	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g		-	31	-	-	38|38	-	-	-	26|26	-	20|20	19	-	50	69	-	-	15|15	53|53	-	-	-	-
1-Methylnaphthalene	ug/g		1.67	0.96	-	0.81	1.13	-	-	0.40	-	-	0.934	0.87	0.90	0.98	1.77	-	1.18	-	1.78	-	-	0.052	0.088
VOC																									
Bromodichloromethane (BDCM)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg		-	0.22	-	-	-	-	-	-	-	-	-	-	-	1.35	0.74	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg		-	0.27	-	-	0.17	-	-	-	-	-	-	-	-	0.81	0.87	-	-	0.13	0.25	-	-	-	-
Xylenes, Total	mg/kg		-	1.1|1.1	-	-	0.8	-	-	-	-	-	-	0.2|0.2	-	3.2|3.2	3.7|3.7	-	-	0.5	1.1	-	-	-	-
o-Xylene	mg/kg		-	0.38	-	-	0.26	-	-	-	-	-	-	0.05	-	1.09	1.27	-	-	0.17	0.35	-	-	-	-
Styrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg		-	0.76	-	-	0.57	-	-	-	-	-	-	0.10	-	2.09	2.43	-	-	0.36	0.79	-	-	-	-
1,2,3-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg		1.67	0.96	-	0.81	1.13	-	-	0.40	-	-	0.934	0.87	0.90	0.98	1.77	-	1.18	-	1.78	-	-	0.052	0.088
Acetone	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit	K19-MW17-29-SA3	K19-MW17-29-SA4	K19-MW17-29-SA4	K19-MW17-29-SA6	K19-MW17-30-SA1	K19-MW17-30-SA3	K19-MW17-30-SA6	K19-MW17-31-SA1	K19-MW17-31-SA3	K19-MW17-31-SA5	K19-MW17-31-SA5	K19-MW17-32-SA1	K19-MW17-32-SA3	K19-MW17-32-SA4	K19-MW17-33-SA1	K19-MW17-33-SA4	K19-MW17-34-SA1	K19-MW17-34-SA3	K19-MW17-34-SA3	K19-MW17-34-SA5	K19-MW17-35-SA2	K19-MW17-35-SA2	K19-MW17-35-SA4
Sample Name		03838-06	03838-07	03838-08	03838-10	03838-11	03839-01	03839-04	03839-05	03839-07	03839-09	03839-10	03839-11	03846-01	03846-02	03846-03	03846-06	03846-07	03846-09	03846-10	03846-12	03847-02	03847-03	03847-05
Sample Date		7/24/2017	7/24/2017	7/24/2017	7/24/2017	7/25/2017	7/25/2017	7/25/2017	7/26/2017	7/26/2017	7/26/2017	7/26/2017	7/26/2017	7/26/2017	7/26/2017	7/26/2017	7/26/2017	7/27/2017	7/27/2017	7/27/2017	7/27/2017	7/27/2017	7/27/2017	7/27/2017
Sample Depth		2.5-2.8 m	3.4-3.7 m	3.4-3.7 m	5.3-5.5 m	0.3-0.5 m	3.5-3.9 m	8-8.7 m	0.3-0.5 m	3.5-4 m	6.4-6.8 m	6.4-6.8 m	0.3-0.5 m	3.5-4 m	5-5.5 m	0.3-0.5 m	5-5.5 m	0.3-0.5 m	3.5-4 m	3.5-4 m	6-6.5 m	1-1.5 m	1-1.5 m	2.5-3 m
SYS_SAMPLE_CODE		8598949-03838-06	8598950-03838-07	8598951-03838-08	8598953-03838-10	8598954-03838-11	8601360-03839-01	8601377-03839-04	8601386-03839-05	8601394-03839-07	8601397-03839-09	8601399-03839-10	8601404-03839-11	8601416-03846-01	8601417-03846-02	8601418-03846-03	8601422-03846-06	8601423-03846-07	8601425-03846-09	8601427-03846-10	8601431-03846-12	8601469-03847-02	8601470-03847-03	8601472-03847-05
PARENT_SAMPLE_CODE				8598950-03838-07								8601397-03839-09								8601425-03846-09			8601469-03847-02	
SAMPLE_TYPE_CODE		N	N	FD	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	FD	N	N	FD	N
FIELD_SDG		17N243343	17N243343	17N243343	17N243343	17N243343	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826
PAH																								
Acenaphthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg	-	-	-	0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg	-	-	-	0.05	-	0.04	0.04	-	0.03	0.03	0.04	-	-	0.03	-	0.04	-	0.03	0.03	0.04	-	-	-
Benzo(b)fluoranthene	mg/kg	-	-	-	0.36	-	0.07	0.07	-	0.05	0.06	0.06	0.06	0.07	0.06	-	0.08	-	0.07	0.09	0.07	-	-	-
Benzo(g,h,i)perylene	mg/kg	-	-	-	0.53	-	0.27	0.26	-	0.18	0.23	0.25	0.08	0.15	0.15	-	0.23	-	0.18	0.18	0.21	-	-	-
Benzo(k)fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg	-	-	-	0.70	-	0.14	0.12	-	0.09	0.11	0.12	0.08	0.14	0.11	-	0.16	-	0.12	0.12	0.15	-	-	-
Dibenzo(a,h)anthracene	mg/kg	0.005	0.006	0.006	0.076	-	-	0.007	0.011	0.006	0.006	0.006	0.017	0.005	0.006	-	0.011	-	0.010	0.011	0.007	-	-	0.005
Fluoranthene	mg/kg	-	-	-	0.10	-	0.05	0.06	-	0.04	0.05	0.06	-	0.03	0.03	-	0.06	-	0.05	0.05	0.05	0.01	0.01	-
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg	-	-	-	0.18	-	0.06	0.06	-	0.05	0.05	0.06	-	-	0.05	-	0.07	-	0.05	0.06	0.06	-	-	-
Benzo(b,j) fluoranthene	mg/kg	-	-	-	0.36	-	0.07	0.07	-	0.05	0.06	0.06	0.06	0.07	0.06	-	0.08	-	0.07	0.09	0.07	-	-	-
Fluorene	mg/kg	0.13	0.08	0.12	0.04	-	0.17	0.23	-	0.13	0.21	0.23	-	0.03	0.20	-	0.08	-	0.03	0.03	0.20	0.13	0.10	-
Indeno(1,2,3-c,d)pyrene	mg/kg	-	-	-	0.07	-	0.02	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	0.306	0.746	0.96	0.256	-	0.304	1.77	0.008	0.228	1.22	1.53	0.011	0.029	0.428	-	0.123	-	0.121	0.151	0.94	1.17	1.01	0.022
Phenanthrene	mg/kg	0.20	0.16	0.18	0.61	-	0.52	0.61	0.02	0.36	0.55	0.60	0.07	0.19	0.51	-	0.67	-	0.47	0.50	0.62	0.19	0.13	0.06
Pyrene	mg/kg	0.01	-	-	0.20	-	0.09	0.10	0.01	0.06	0.10	0.10	0.02	0.07	0.07	-	0.11	-	0.09	0.08	0.11	0.01	0.01	-
2-methylnaphthalene	mg/kg	-	0.340	0.51	0.375	-	1.30	2.64	0.010	0.764	2.17	2.47	0.028	0.086	1.47	-	1.00	-	0.544	0.657	1.73	3.76	3.29	0.045
PAH, Low Molecular Weight	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, High Molecular Weight	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, Total	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C10-C19)	mg/kg	857	484	573	57	-	98	80	-	66	80	84	-	221	82	-	120	-	61	64	120	374	308	39
LEPH (C10-C19) Less PAHs	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	mg/kg	119	85	89	54	-	122	78	25	80	81	85	98	347	97	-	130	-	82	81	120	400	318	72
HEPH (C19-C32) Less PAHs	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VHC (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	118	84	89	53	-	121	77	25	80	81	85	98	347	97	-	130	-	82	80	120	400	318	72
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	857	483	572	56	-	97	77	-	65	79	82	-	221	81	-	119	-	60	63	118	372	307	39
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	30|30	46|46	-	-	27	35	-	17	31	27	-	-	20	-	24	-	12	11	21	19	17	-
Total Organic Carbon	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g	-	31|31	47|47	-	-	28	38	-	17	32	28	-	-	20	-	24	-	12	11	22	20	17	-
1-Methylnaphthalene	ug/g	0.593	0.935	1.18	0.555	-	0.93	1.93	0.009	0.528	1.53	1.78	0.031	0.074	0.95	-	0.57	-	0.401	0.468	1.21	1.71	1.44	0.028
VOC																								
Bromodichloromethane (BDCM)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg	0.04	0.05	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	-	-	-	-	-	-	0.34	-	-	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	-	0.08	0.14	-	-	-	0.44	-	-	0.24	0.11	-	-	-	-	-	-	-	-	0.07	0.12	0.11	-
Xylenes, Total	mg/kg	-	-	0.3	-	-	-	1.8	-	-	1.1	0.5	-	-	-	-	-	-	-	-	0.3	0.3	0.3	-
o-Xylene	mg/kg	-	-	-	-	-	-	0.60	-	-	0.34	0.16	-	-	-	-	-	-	-	-	0.10	0.07	0.06	-
Styrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg	-	0.15	0.26	-	-	-	1.21	-	-	0.71	0.34	-	-	-	-	-	-	-	-	0.22	0.24	0.22	-
1,2,3-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg	0.593	0.935	1.18	0.555	-	0.93	1.93	0.009	0.528	1.53	1.78	0.031	0.074	0.95	-	0.57	-	0.401	0.468	1.21	1.71	1.44	0.028
Acetone	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit																								
Location		K19-MW17-35-SA6	K19-MW17-35-SA6	K19-MW17-35-SA8	K19-TP16-23	K19-TP16-23	K19-TP17-51-SA1	K19-TP17-51-SA3	K19-TP17-51-SA5	K19-TP17-52-SA1	K19-TP17-52-SA1	K19-TP17-52-SA3	K19-TP17-52-SA4	K19-TP17-53-SA1	K19-TP17-53-SA2	K19-TP17-54-SA1	K19-TP17-54-SA4	K19-TP17-55-SA1	K19-TP17-55-SA2	K19-TP17-55-SA3	K19-TP17-55-SA4	K19-TP17-56-SA1	K19-TP17-56-SA2	K19-TP17-56-SA3
Sample Name		03847-07	03847-08	03847-10	01481-05	01481-07	03796-01	03796-03	03796-05	03796-06	03796-07	03796-09	03796-10	03796-11	03796-12	03820-03	03820-07	03820-08	03820-09	03820-10	03820-11	03821-01	03821-02	03821-03
Sample Date		7/27/2017	7/27/2017	7/27/2017	8/30/2016	8/30/2016	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/15/2017	7/15/2017	7/15/2017
Sample Depth		4-4.5 m	4-4.5 m	6.5-7 m	0.5-0.5 m	1.5-1.5 m	0.7-0.7 m	2.8-2.8 m	4.9-4.9 m	0.8-0.8 m	0.8-0.8 m	2.9-2.9 m	4-4 m	0.8-0.8 m	1.9-1.9 m	0.7-0.7 m	4.1-4.1 m	0.5-0.5 m	1.8-1.8 m	3-3 m	4-4 m	0.6-0.6 m	1.5-1.5 m	2.5-2.5 m
SYS_SAMPLE_CODE		8601474-03847-07	8601475-03847-08	8601477-03847-10	PK6756	PK6758	8565765-03796-01	8565771-03796-03	8565779-03796-05	8565794-03796-06	8565799-03796-07	8565802-03796-09	8565804-03796-10	8565805-03796-11	8565806-03796-12	8565809-03820-03	8565813-03820-07	8565814-03820-08	8565815-03820-09	8565816-03820-10	8565817-03820-11	8565819-03821-01	8565820-03821-02	8565821-03821-03
PARENT_SAMPLE_CODE			8601474-03847-07								8565794-03796-06													
SAMPLE_TYPE_CODE		N	FD	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N
FIELD_SDG		17N243826	17N243826	17N243826	B675549	B675549	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668
PAH																								
Acenaphthene	mg/kg	0.012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg	-	-	0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	-	-	0.07	-	0.038	-	-	-	-	-	0.05	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	-	-	0.15	-	-	-	-	-	-	-	0.12	-	-	0.05	-	0.06	-	-	-	0.05	-	-	-
Benzo(k)fluoranthene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg	-	-	0.14	-	-	-	-	-	-	-	0.09	-	-	-	-	-	-	-	-	0.05	-	-	-
Dibenzo(a,h)anthracene	mg/kg	0.005	0.005	0.007	-	-	-	-	-	-	-	0.006	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg	-	-	0.04	-	-	-	-	-	-	-	0.01	-	-	-	-	0.01	-	-	-	0.01	-	-	-
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg	-	-	0.05	0.041	0.044	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j) fluoranthene	mg/kg	-	-	0.07	-	0.038	-	-	-	-	-	0.05	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	mg/kg	-	-	0.05	-	-	-	-	-	-	-	-	-	-	-	-	0.06	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	0.387	0.471	0.016	-	-	-	-	-	0.022	0.026	0.020	-	-	-	-	0.187	-	-	-	-	-	-	-
Phenanthrene	mg/kg	0.07	0.07	0.28	-	0.045	-	-	-	-	-	0.04	-	0.02	0.02	-	0.18	-	-	-	0.08	-	-	-
Pyrene	mg/kg	0.01	0.01	0.08	-	-	-	-	-	-	-	0.05	-	-	-	-	0.02	-	-	-	0.03	-	-	-
2-methylnaphthalene	mg/kg	0.119	0.190	0.064	-	-	-	-	-	0.023	0.028	0.164	-	0.005	-	-	0.446	-	-	-	0.013	-	-	-
PAH, Low Molecular Weight	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, High Molecular Weight	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, Total	mg/kg	-	-	-	-	0.082	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C10-C19)	mg/kg	61	77	79	-	-	-	-	-	34	45	121	-	-	-	-	50	-	-	-	83	-	-	-
LEPH (C10-C19) Less PAHs	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	mg/kg	66	82	100	-	-	-	-	-	152	170	174	-	22	26	-	49	-	30	-	96	-	-	-
HEPH (C19-C32) Less PAHs	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VHC (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	66	82	100	-	-	-	-	-	152	170	174	-	22	26	-	49	-	30	-	96	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	60	76	79	-	-	-	-	-	34	44	121	-	-	-	-	49	-	-	-	83	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	34	42	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g	36	44	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g	0.108	0.144	0.067	-	-	-	-	-	0.015	0.018	0.090	-	0.005	-	-	0.292	-	-	-	0.016	-	-	-
VOC																								
Bromodichloromethane (BDCM)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg	-	-	-	-	-	-	-	-	0.07	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg	0.30	0.39	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	0.06	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	1.13	1.63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total	mg/kg	0.3	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/kg	0.06	0.06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg	0.20	0.22	-	-	-	-	-	-	0.06	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg	0.108	0.144	0.067	-	-	-	-	-	0.015	0.018	0.090	-	0.005	-	-	0.292	-	-	-	0.016	-	-	-
Acetone	mg/kg	-	-	-	-	-	-	-	-	0.8	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit	Location	K19-TP17-56-SA4	K19-TP17-57-SA1	K19-TP17-57-SA1	K19-TP17-57-SA1	K19-TP17-57-SA4	K19-TP17-58-SA1	K19-TP17-58-SA3	K19-TP17-58-SA4	K19-TP17-59-SA1	K19-TP17-59-SA1	K19-TP17-59-SA3	K19-TP17-60-SA1	K19-TP17-60-SA4	K19-TP17-60-SA5	K19-TP17-61-SA1	K19-TP17-61-SA2	K19-TP17-61-SA5	K19-TP17-62-SA1	K19-TP17-62-SA1	K19-TP17-62-SA2	K19-TP17-62-SA3	K19-TP17-62-SA5	K19-TP17-63-SA1
		Sample Name	03821-04	03821-05	03821-06	03843-05	03821-09	03821-10	03821-12	03822-01	03822-02	03822-03	03822-05	03822-07	03822-10	03822-11	03822-12	03823-01	03823-04	03823-05	03823-06	03823-07	03823-08	03823-10	03823-11
		Sample Date	7/15/2017	7/15/2017	7/15/2017	7/22/2017	7/15/2017	7/15/2017	7/15/2017	7/15/2017	7/15/2017	7/15/2017	7/15/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017
		Sample Depth	4-4 m	0.6-0.6 m	0.6-0.6 m	0.2-0.2 m	4-4 m	0.5-0.5 m	2.5-2.5 m	4-4 m	0.5-0.5 m	0.5-0.5 m	2.6-2.6 m	0.6-0.6 m	3.7-3.7 m	4.2-4.2 m	0.6-0.6 m	1.5-1.5 m	4.4-4.4 m	0.6-0.6 m	0.6-0.6 m	1.7-1.7 m	2.5-2.5 m	4.2-4.2 m	0.7-0.7 m
		SYS_SAMPLE_CODE	8565822-03821-04	8565823-03821-05	8565824-03821-06	8590592-03843-05	8565827-03821-09	8565828-03821-10	8565830-03821-12	8565831-03822-01	8565832-03822-02	8565833-03822-03	8565835-03822-05	8565838-03822-07	8565862-03822-10	8565877-03822-11	8565900-03822-12	8582689-03823-01	8582692-03823-04	8582693-03823-05	8582695-03823-06	8582697-03823-07	8582698-03823-08	8582700-03823-10	8582701-03823-11
		PARENT_SAMPLE_CODE			8565823-03821-05							8565832-03822-02									8582693-03823-05				
		SAMPLE_TYPE_CODE	N	N	FD	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	FD	N	N	N	N
		FIELD_SDG	17N238668	17N238668	17N238668	17N242036	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971
PAH																									
Acenaphthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg		-	-	-	-	0.11	-	-	0.07	-	-	0.05	-	0.09	0.09	-	-	0.07	-	-	-	0.08	-	-
Benzo(k)fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg		-	-	-	-	0.10	-	-	-	-	-	-	-	0.06	0.05	-	-	0.06	-	-	-	0.05	-	-
Dibenzo(a,h)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.007	0.005	-	-	-	0.008	-	-
Fluoranthene	mg/kg		-	-	-	-	0.01	-	-	0.01	-	-	-	-	0.02	0.02	-	-	0.02	-	-	-	-	-	-
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j) fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	mg/kg		-	-	-	-	-	-	-	0.02	-	-	-	-	-	0.03	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg		-	-	-	-	-	-	-	0.015	-	-	-	-	0.012	0.084	-	-	0.025	-	-	-	-	-	-
Phenanthrene	mg/kg		0.06	-	-	-	0.07	-	-	0.13	-	-	-	-	0.11	0.16	-	0.02	0.14	-	-	-	0.05	-	-
Pyrene	mg/kg		0.01	-	-	-	0.07	-	-	0.03	-	-	0.01	-	0.04	0.04	-	-	0.04	-	-	-	0.01	-	-
2-methylnaphthalene	mg/kg		0.026	-	-	-	0.005	-	-	0.113	-	-	-	-	0.052	0.239	-	-	0.126	-	-	-	-	-	-
PAH, Low Molecular Weight	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, High Molecular Weight	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, Total	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C10-C19)	mg/kg		28	-	-	-	77	-	-	47	-	-	-	-	46	46	-	-	26	313	252	-	50	-	-
LEPH (C10-C19) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	mg/kg		36	-	-	-	72	-	29	46	-	-	35	-	49	48	-	34	27	280	284	-	88	-	-
HEPH (C19-C32) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VHC (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		36	-	-	-	72	-	29	46	-	-	35	-	49	48	-	34	27	280	284	-	88	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		28	-	-	-	77	-	-	47	-	-	-	-	46	46	-	-	26	313	252	-	50	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g		0.018	-	-	-	0.009	-	-	0.071	-	-	0.005	-	0.039	0.156	-	0.006	0.085	0.023	0.014	-	0.013	-	-
VOC																									
Bromodichloromethane (BDCM)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg		0.018	-	-	-	0.009	-	-	0.071	-	-	0.005	-	0.039	0.156	-	0.006	0.085	0.023	0.014	-	0.013	-	-
Acetone	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit	Location	K19-TP17-63-SA2	K19-TP17-63-SA4	K19-TP17-64-SA1	K19-TP17-64-SA3	K19-TP17-64-SA4	K19-TP17-65-SA2	K19-TP17-65-SA2	K19-TP17-65-SA3	K19-TP17-65-SA4	K19-TP17-66-SA1	K19-TP17-66-SA2	K19-TP17-66-SA3	K19-TP17-67-SA1	K19-TP17-67-SA2	K19-TP17-67-SA3	K19-TP17-68-SA1	K19-TP17-68-SA3	K19-TP17-68-SA5	K19-TP17-69-SA3	K19-TP17-69-SA5	K19-TP17-70-SA1	K19-TP17-70-SA1	K19-TP17-70-SA3
		Sample Name	03823-12	03824-02	03824-03	03824-05	03824-06	03824-08	03824-09	03824-10	03824-11	03824-12	03825-01	03825-02	03825-04	03825-05	03825-07	03825-09	03825-11	03826-01	03826-04	03826-06	03826-07	03826-08	03826-10
		Sample Date	7/16/2017	7/16/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017
		Sample Depth	1.9-1.9 m	4-4 m	0.5-0.5 m	2.6-2.6 m	4.2-4.2 m	1.5-1.5 m	1.5-1.5 m	2.6-2.6 m	4.1-4.1 m	0.5-0.5 m	1.6-1.6 m	2.5-2.5 m	0.5-0.5 m	1.4-1.4 m	2.5-2.5 m	0.6-0.6 m	2.5-2.5 m	4.1-4.1 m	2.6-2.6 m	5.1-5.1 m	0.5-0.5 m	0.5-0.5 m	2.4-2.4 m
		SYS_SAMPLE_CODE	8582704-03823-12	8582706-03824-02	8582708-03824-03	8582711-03824-05	8582712-03824-06	8582723-03824-08	8582729-03824-09	8582730-03824-10	8582741-03824-11	8582746-03824-12	8582754-03825-01	8582762-03825-02	8582764-03825-04	8582766-03825-05	8582768-03825-07	8582770-03825-09	8582774-03825-11	8582776-03826-01	8582779-03826-04	8582782-03826-06	8582785-03826-07	8582786-03826-08	8582789-03826-10
		PARENT_SAMPLE_CODE							8582723-03824-08															8582785-03826-07	
		SAMPLE_TYPE_CODE	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N
		FIELD_SDG	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971
PAH																									
Acenaphthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg		-	0.06	-	0.05	-	-	-	-	0.10	-	-	-	-	-	-	-	-	0.07	-	0.06	-	-	-
Benzo(k)fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg		-	-	-	0.05	-	-	-	-	0.07	-	-	-	-	-	-	-	-	0.05	-	0.07	-	-	-
Dibenzo(a,h)anthracene	mg/kg		-	-	-	0.007	-	-	-	-	-	-	0.007	-	-	-	0.006	0.005	-	-	-	-	-	-	-
Fluoranthene	mg/kg		-	0.01	-	0.01	-	-	-	-	0.03	-	-	-	-	-	-	-	0.01	0.02	-	0.01	-	-	-
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j) fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	mg/kg		-	0.04	-	-	-	-	-	-	0.08	-	-	-	-	-	-	-	0.10	0.09	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg		-	0.027	-	0.006	-	-	-	-	0.208	-	-	-	-	-	-	-	-	0.218	-	-	-	-	-
Phenanthrene	mg/kg		0.03	0.14	-	0.05	-	-	-	-	0.26	-	0.02	-	-	-	0.02	-	0.09	0.22	-	0.09	-	-	-
Pyrene	mg/kg		-	0.03	-	0.01	-	-	-	-	0.05	-	-	-	-	-	-	-	0.01	0.04	-	0.03	-	-	-
2-methylnaphthalene	mg/kg		-	0.170	-	0.011	-	-	-	-	0.501	-	-	-	-	-	-	-	-	0.460	-	-	-	-	-
PAH, Low Molecular Weight	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, High Molecular Weight	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, Total	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C10-C19)	mg/kg		123	27	-	20	-	-	-	-	50	-	-	-	-	-	-	-	456	77	-	104	-	-	-
LEPH (C10-C19) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	mg/kg		-	31	-	30	-	-	-	-	50	-	26	-	-	-	-	23	24	35	-	126	-	-	-
HEPH (C19-C32) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VHC (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	31	-	30	-	-	-	-	49	-	26	-	-	-	-	23	24	35	-	126	-	-	-
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		123	27	-	20	-	-	-	-	50	-	-	-	-	-	-	-	456	76	-	104	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		-	-	-	-	14	-	-	-	-	-	-	-	-	-	-	-	16	-	-	-	-	-	-
Total Organic Carbon	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g		-	-	-	-	14	-	-	-	-	-	-	-	-	-	-	-	16	-	-	-	-	-	-
1-Methylnaphthalene	ug/g		0.062	0.105	-	0.015	-	-	-	-	0.334	-	0.005	-	-	-	0.005	-	0.071	0.317	-	-	-	-	-
VOC																									
Bromodichloromethane (BDCM)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg		-	-	-	-	0.06	-	-	-	-	-	-	-	-	-	-	-	-	0.06	-	-	-	-	-
1,2,3-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg		0.062	0.105	-	0.015	-	-	-	-	0.334	-	0.005	-	-	-	0.005	-	0.071	0.317	-	-	-	-	-
Acetone	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit	Location	K19-TP17-70-SA4	K19-TP17-70-SA5	K19-TP17-71-SA1	K19-TP17-71-SA3	K19-TP17-71-SA3	K19-TP17-72-SA1	K19-TP17-72-SA3	K19-TP17-73-SA1	K19-TP17-73-SA2	K19-TP17-74-SA1	K19-TP17-74-SA2	K19-TP17-74-SA2	K19-TP17-75-SA1	K19-TP17-75-SA4	K19-TP17-76-SA1	K19-TP17-76-SA2	K19-TP17-76-SA4	K19-TP17-77-SA1	K19-TP17-77-SA2	K19-TP17-77-SA4	K19-TP17-78-SA1	K19-TP17-78-SA4	K19-TP17-79-SA4
		Sample Name	03826-11	03826-12	03827-01	03827-03	03827-04	03827-06	03827-08	03827-10	03827-11	03828-01	03828-02	03828-03	03828-06	03828-09	03828-10	03828-11	03829-02	03829-03	03829-04	03829-06	03829-07	03829-10	03840-03
		Sample Date	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017
		Sample Depth	3.5-3.5 m	4.9-4.9 m	0.5-0.5 m	2.5-2.5 m	2.5-2.5 m	0.6-0.6 m	2.4-2.4 m	0.5-0.5 m	1.4-1.4 m	0.6-0.6 m	1.6-1.6 m	1.6-1.6 m	0.6-0.6 m	3-3 m	0.7-0.7 m	1.7-1.7 m	3.2-3.2 m	0.6-0.6 m	1.7-1.7 m	3.3-3.3 m	0.7-0.7 m	3.2-3.2 m	3-3 m
		SYS_SAMPLE_CODE	8582791-03826-11	8582794-03826-12	8582795-03827-01	8582809-03827-03	8582811-03827-04	8582820-03827-06	8582829-03827-08	8582832-03827-10	8582833-03827-11	8590247-03828-01	8590249-03828-02	8590250-03828-03	8590253-03828-06	8590256-03828-09	8590257-03828-10	8590258-03828-11	8590275-03829-02	8590288-03829-03	8590289-03829-04	8590298-03829-06	8590299-03829-07	8590309-03829-10	8590500-03840-03
		PARENT_SAMPLE_CODE					8582809-03827-03							8590249-03828-02											
		SAMPLE_TYPE_CODE	N	N	N	N	FD	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N
		FIELD_SDG	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036
PAH																									
Acenaphthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.009	-	-	-	-	-	-	-
Acenaphthylene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.023	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg		-	0.06	-	-	-	-	-	-	0.07	-	-	-	-	-	-	-	0.07	-	-	0.06	-	0.06	0.06
Benzo(k)fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg		-	0.06	-	-	-	-	0.05	-	-	-	-	-	-	-	-	-	0.06	-	0.05	0.05	-	0.05	0.06
Dibenzo(a,h)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg		-	0.01	-	0.01	0.01	-	-	-	-	-	-	-	-	-	-	-	0.02	-	0.01	0.02	-	0.02	0.01
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j) fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.07	-	-	0.02	-	0.06	0.04
Indeno(1,2,3-c,d)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg		-	-	-	-	0.006	-	-	-	-	-	-	-	-	-	-	-	0.225	-	-	0.089	-	0.048	0.019
Phenanthrene	mg/kg		-	0.06	-	0.05	0.07	-	0.04	-	0.06	-	-	-	-	-	-	0.02	0.22	-	0.03	0.16	-	0.17	0.18
Pyrene	mg/kg		-	0.03	-	-	-	-	0.02	-	0.01	-	-	-	-	-	-	-	0.04	-	0.01	0.04	-	0.04	0.03
2-methylnaphthalene	mg/kg		-	-	-	-	-	-	0.008	-	0.013	-	-	-	-	-	-	-	0.524	-	0.007	0.227	-	0.219	0.183
PAH, Low Molecular Weight	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, High Molecular Weight	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, Total	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C10-C19)	mg/kg		-	121	-	-	-	-	48	-	126	-	-	-	-	-	-	-	55	-	-	38	-	44	77
LEPH (C10-C19) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	mg/kg		-	181	-	-	-	-	54	-	163	-	22	-	29	-	-	28	58	-	35	40	22	46	79
HEPH (C19-C32) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VHC (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	180	-	-	-	-	53	-	163	-	22	-	29	-	-	28	58	-	35	40	22	45	79
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	121	-	-	-	-	48	-	126	-	-	-	-	-	-	-	55	-	-	38	-	44	76
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	14	-	-	16|16	-	-	12|12	-	12|12	-
Total Organic Carbon	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	14	-	-	16|16	-	-	12|12	-	12|12	-
1-Methylnaphthalene	ug/g		-	0.015	-	0.006	0.008	-	0.012	-	0.022	-	-	-	-	-	-	0.006	0.382	-	0.012	0.165	-	0.152	0.113
VOC																									
Bromodichloromethane (BDCM)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg		-	0.015	-	0.006	0.008	-	0.012	-	0.022	-	-	-	-	-	-	0.006	0.382	-	0.012	0.165	-	0.152	0.113
Acetone	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-1: Soil Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit	Location	K19-TP17-80-SA1	K19-TP17-80-SA2	K19-TP17-80-SA3	K19-TP17-80-SA4	K19-TP17-80-SA5	K19-TP17-81-SA1	K19-TP17-81-SA3	K19-TP17-82-SA1	K19-TP17-82-SA2	K19-TP17-82-SA2	K19-TP17-82-SA3	K19-TP17-82-SA4	K19-TP17-83-SA2	K19-TP17-83-SA4	K19-TP17-84-SA2	K19-TP17-85-SA1	K19-TP17-85-SA2	K19-TP17-85-SA3	K19-TP17-85-SA3	K19-TP17-86-SA1	K19-TP17-86-SA4	K19-TP17-87-SA3	K19-TP17-87-SA5
		Sample Name	03840-04	03840-05	03840-06	03840-07	03840-08	03840-09	03840-11	03841-01	03841-02	03841-03	03841-04	03841-05	03841-07	03841-09	03841-12	03842-03	03842-04	03842-05	03842-06	03842-08	03842-11	03843-02	03843-04
		Sample Date	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017
		Sample Depth	0.5-0.5 m	1.4-1.4 m	2.6-2.6 m	3.7-3.7 m	4.3-4.3 m	0.6-0.6 m	2.6-2.6 m	0.7-0.7 m	1.4-1.4 m	1.4-1.4 m	2.5-2.5 m	4.2-4.2 m	1.5-1.5 m	3.9-3.9 m	1.6-1.6 m	0.7-0.7 m	1.5-1.5 m	2.5-2.5 m	2.5-2.5 m	0.7-0.7 m	4-4 m	2.8-2.8 m	4.8-4.8 m
		SYS_SAMPLE_CODE	8590501-03840-04	8590502-03840-05	8590503-03840-06	8590505-03840-07	8590506-03840-08	8590507-03840-09	8590509-03840-11	8590511-03841-01	8590523-03841-02	8590524-03841-03	8590527-03841-04	8590528-03841-05	8590530-03841-07	8590545-03841-09	8590548-03841-12	8590567-03842-03	8590569-03842-04	8590572-03842-05	8590573-03842-06	8590576-03842-08	8590581-03842-11	8590588-03843-02	8590591-03843-04
		PARENT_SAMPLE_CODE										8590523-03841-02									8590572-03842-05				
		SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	FD	N	N	N	N
		FIELD_SDG	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036
PAH																									
Acenaphthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.006	-	-	0.005	-	-	-	-	-
Acenaphthylene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg		-	-	-	-	-	-	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg		-	-	0.06	-	-	-	0.08	-	-	-	-	-	-	0.05	-	-	-	-	-	-	-	0.09	0.05
Benzo(k)fluoranthene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg		-	-	0.05	-	-	-	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.08	-
Dibenzo(a,h)anthracene	mg/kg		-	-	0.005	-	-	-	0.009	-	0.005	0.008	0.006	-	-	-	0.007	-	-	-	-	-	-	0.006	-
Fluoranthene	mg/kg		-	-	-	0.02	-	-	0.01	-	-	-	0.01	-	-	0.01	-	-	-	-	-	-	-	0.03	0.01
Benzo(a)pyrene Total Potency Equivalence (TPE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j) fluoranthene	mg/kg		-	-	-	-	-	-	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	0.07	-	-	-	-	-	-	-	-	0.05
Indeno(1,2,3-c,d)pyrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg		-	-	0.021	0.011	-	-	-	-	0.008	-	-	-	-	0.159	-	-	-	-	-	-	-	-	0.027
Phenanthrene	mg/kg		-	-	0.04	0.12	-	-	0.04	-	0.03	0.05	0.04	-	-	0.19	0.02	-	-	0.02	-	-	-	0.04	0.14
Pyrene	mg/kg		-	-	0.01	0.05	-	-	0.03	-	-	-	0.01	-	-	0.03	-	-	-	0.01	-	-	-	0.06	0.02
2-methylnaphthalene	mg/kg		-	-	-	0.064	-	-	-	-	-	-	0.009	-	-	0.425	-	-	-	-	-	-	-	-	0.156
PAH, Low Molecular Weight	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, High Molecular Weight	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, Total	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C10-C19)	mg/kg		-	-	383	25	-	-	-	-	304	485	-	-	-	28	-	-	-	-	-	-	-	46	29
LEPH (C10-C19) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	mg/kg		-	-	33	33	-	20	28	-	31	42	20	-	-	28	23	-	21	-	-	-	-	76	34
HEPH (C19-C32) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	33	33	-	20	28	-	31	41	20	-	-	28	23	-	21	-	-	-	-	76	34
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	383	25	-	-	-	-	304	485	-	-	-	27	-	-	-	-	-	-	-	46	28
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	14	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	ug/g		-	-	-	-	-	-	-	-	-	-	-	-	-	14	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	ug/g		-	-	0.054	0.055	-	-	0.020	-	0.029	0.049	0.013	-	-	0.272	-	-	-	0.006	-	-	-	0.019	0.093
VOC																									
Bromodichloromethane (BDCM)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.13
1,1,2-trichloroethane	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	mg/kg		-	-	0.054	0.055	-	-	0.020	-	0.029	0.049	0.013	-	-	0.272	-	-	-	0.006	-	-	-	0.019	0.093
Acetone	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-2: Groundwater Petroleum Hydrocarbon Detections -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit	Location	DRILL WATER	DUP-01	DUP-02	K19 DW WELL	K19 DW WELL	K19-09MW-03	K19-09MW-06	K19-09MW-06	K19-09MW-09	K19-10MW10	K19-10MW-10	K19-10MW-10	K19-10MW-24	K19A-09MW-02	K19A-09MW-02	K19A-09MW-02	K19A-09MW-03	K19A-09MW-03	K19A-09MW-03
		Sample Name	03605-01	DUP-01	DUP-02	DUP-SW-K19	K19 DW WELL	03816-03	03830-02	03830-03	03816-01	03375-04	03816-05	03816-06	03816-04	03830-05	06706-05	K19A-09MW-02		06706-04	K19A-09MW-03
		Sample Date	7/27/2017	2/8/2016	2/7/2016	6/15/2016	6/15/2016	7/21/2017	7/16/2017	7/16/2017	7/21/2017	2/4/2017	7/21/2017	7/21/2017	7/21/2017	7/16/2017	2/9/2017	6/8/2016	11/7/2009	2/9/2017	6/9/2016
		SYS_SAMPLE_CODE	8604435-03605-01	OC8119	OC8118	OV9109	OV9110	8590128-03816-03	8582954-03830-02	8582957-03830-03	8590033-03816-01	QN4369	8590146-03816-05	8590147-03816-06	8590131-03816-04	8582971-03830-05	QN9116	OU9528	K19A-09MW-03	QN9115	OU9606
		PARENT_SAMPLE_CODE					OV9109			8582954-03830-02				8590146-03816-05							
		SAMPLE_TYPE_CODE	N	FD	FD	N	FD	N	N	FD	N	N	N	FD	N	N	N	N	N	N	N
		FIELD_SDG	17N244304	B611045	B611045	B648667	B648667	17N242036	17N240971	17N240971	17N242036	B709734	17N242036	17N242036	17N242036	17N240971	B710365	B646703		B710365	B646703
PAH																					
Acenaphthene	µg/L		-	-	-	1.2	1.2	0.03	-	-	-	-	0.02	0.02	-	-	-	-	-	-	-
Acenaphthylene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acridine	µg/L		-	-	-	0.37	0.38	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/L		-	-	-	0.064	0.062	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	µg/L		-	-	-	0.049	0.052	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	µg/L		-	-	-	0.049	0.054	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	µg/L		-	-	-	0.065	0.060	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	µg/L		-	-	-	0.079	0.076	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/L		-	-	-	0.83	0.83	-	-	-	-	-	0.03	0.02	-	-	-	-	-	-	-
Benzo(b,j) fluoranthene	µg/L		-	-	-	0.24	0.24	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	µg/L		-	-	-	0.53	0.52	0.03	-	-	-	-	0.02	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/L		0.16	-	-	2.1	2.1	-	-	-	-	1.7	0.65	0.72	-	-	-	-	-	-	-
Phenanthrene	µg/L		-	-	-	0.44	0.43	0.12	-	-	-	-	0.14	0.09	-	-	-	-	-	-	-
Pyrene	µg/L		-	-	-	0.75	0.74	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Quinoline	µg/L		-	-	-	0.55	0.56	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-methylnaphthalene	µg/L		-	-	-	0.31	0.30	-	-	-	-	1.9	0.46	0.49	-	-	-	-	-	-	-
PAH, Low Molecular Weight	µg/L		-	-	-	5.6	5.5	-	-	-	-	3.6	-	-	-	-	-	-	-	-	-
PAH, High Molecular Weight	µg/L		-	-	-	2.1	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, Total	µg/L		-	-	-	7.6	7.6	-	-	-	-	3.6	-	-	-	-	-	-	-	-	-
Extractable Petroleum Hydrocarbons (C10-C1	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Extractable Petroleum Hydrocarbons (C19-C3	µg/L		260	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX, VPH,	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	µg/L		-	-	-	-	-	-	-	-	-	-	230	190	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (I	µg/L		260	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	µg/L		-	-	-	-	-	-	-	-	-	-	0.42	0.46	-	-	-	-	-	-	-
VOC																					
Chloroform	µg/L		2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trihalomethanes (Total)	µg/L		2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	µg/L		-	-	-	-	-	-	-	-	-	1.7	0.7	0.8	-	-	-	-	-	-	-
Ethylbenzene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/L		-	0.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total	µg/L		-	0.50	-	-	-	-	-	-	-	4.3	2|2	2|2	-	-	-	-	-	-	-
o-Xylene	µg/L		-	-	-	-	-	-	-	-	-	1.4	0.8	0.7	-	-	-	-	-	-	-
m,p-Xylenes	µg/L		-	0.50	-	-	-	-	-	-	-	2.9	1.2	1.3	-	-	-	-	-	-	-
2-Butanone	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	ug/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbons																					
Volatile Hydrocarbon Fraction	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX, VPH,	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-2: Groundwater Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit																				
Location		K19A-09MW-04	K19A-09MW-05	K19A-09MW-05	K19A-09MW-05	K19A-09MW-06	K19A-09MW-06	K19A-09MW-07	K19A-09MW-08	K19A-09MW-09	K19A-09MW-09	K19A-09MW-09	K19A-09MW-10	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	K19A-10MW-04
Sample Name		K19A-09MW-04		K19A-09MW-05	MWA	06706-01	K19A-09MW-06	K19A-09MW-07	K19A-09MW-08		06706-03	K19A-09MW-09	K19A-09MW-10	06690-02	3808-06	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	SAMPLE E	K19A-10MW-04
Sample Date		6/7/2016	11/5/2009	6/7/2016	6/7/2016	2/8/2017	6/7/2016	6/13/2016	6/13/2016	11/5/2009	2/8/2017	6/16/2016	6/16/2016	2/7/2017	7/14/2017	8/26/2010	9/12/2010	6/16/2016	6/16/2016	9/13/2010
SYS_SAMPLE_CODE		OU9525	K19A-09MW-05	OU9519	OU9520	QN9112	OU9522	OV9102	OV9103	K19A-09MW-09	QN9114	OW6860	OW6861	QN9068	8565760-3808-06	W62838	W94460	OW6897	OW6898	X00787
PARENT_SAMPLE_CODE					OU9519														OW6897	
SAMPLE_TYPE_CODE		N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N
FIELD_SDG		B646703		B646703	B646703	B710365	B646703	B648667	B648667		B710365	B650178	B650178	B710365	17N238668	B078852	B085207	B650178	B650178	B086989
PAH																					
Acenaphthene	µg/L	-	0.16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.21
Acenaphthylene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acridine	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j) fluoranthene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.42
Indeno(1,2,3-c,d)pyrene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/L	-	-	-	-	0.12	-	-	-	-	-	-	-	-	-	-	-	-	-	0.53
Phenanthrene	µg/L	-	-	-	-	-	-	-	-	0.07	-	-	-	-	-	0.017	0.012	-	-	0.16
Pyrene	µg/L	-	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Quinoline	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-methylnaphthalene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.18
PAH, Low Molecular Weight	µg/L	-	0.16	-	-	0.12	-	-	-	0.07	-	-	-	-	-	-	-	-	-	1.5
PAH, High Molecular Weight	µg/L	-	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, Total	µg/L	-	0.18	-	-	0.12	-	-	-	0.07	-	-	-	-	-	-	-	-	-	1.5
Extractable Petroleum Hydrocarbons (C10-C1	µg/L	-	350	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	370
Light Extractable Petroleum Hydrocarbons (C	µg/L	-	350	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	370
Extractable Petroleum Hydrocarbons (C19-C3	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX, VPH,	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (I	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																					
Chloroform	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trihalomethanes (Total)	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbons																					
Volatile Hydrocarbon Fraction	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX, VPH,	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment det
> Indicates parameter detected above equipment analytica
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-2: Groundwater Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit	Location	K19A-10MW-04	K19A-10MW-05	K19A-10MW-05	K19A-10MW-07	K19A-10MW-07	K19A-10MW-09	K19A-10MW-21	K19A-10MW-21	K19A-10MW-21	K19A-10MW-22	K19A-10MW-22	K19A-10MW-24	K19A-10MW-24	K19A-10MW-24	K19A-10MW-25	K19A-10MW-25	K19A-10MW-25	K19A-10MW-27	K19A-10MW-27
		Sample Name	K19A-10MW-04	K19A-10MW-05	K19A-10MW-05	K19A-10MW-07	K19A-10MW-07	K19A-10MW-09	06689-03	K19A-10MW-21	K19A-10MW-21	K19A-10MW22	K19A-10MW-22	06689-04	06689-05	K19A-10MW-24	DUP-03	K19A-10MW-25	K19A-10MW-25	K19A-10MW-27	K19A-10MW-27
		Sample Date	6/15/2016	9/11/2010	6/7/2016	9/11/2010	6/7/2016	6/7/2016	2/5/2017	9/10/2010	6/16/2016	6/16/2016	9/12/2010	2/6/2017	2/6/2017	9/17/2010	9/13/2010	9/13/2010	6/10/2016	9/17/2010	6/10/2016
		SYS_SAMPLE_CODE	OV9108	W94461	OU9521	W94462	OU9524	OU9523	QN4590	W94465	OW6866	OW6863	W94466	QN4591	QN4592	X20718	X00795	X00791	OV7197	X20719	OV7200
		PARENT_SAMPLE_CODE													QN4591		X00791				
		SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	FD	N	N	N	N
		FIELD_SDG	B648667	B085207	B646703	B085207	B646703	B646703	B709775	B085207	B650178	B650178	B085207	B709775	B709775	B091490	B086989	B086989	B648291	B091490	B648291
PAH																					
Acenaphthene	µg/L		-	-	-	-	-	-	-	0.015	-	-	-	-	-	-	0.024	0.026	-	-	-
Acenaphthylene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acridine	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	µg/L		-	-	-	-	-	-	-	0.017	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j) fluoranthene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	µg/L		-	0.011	-	-	-	-	-	0.064	-	-	-	-	-	-	0.10	0.12	0.053	-	-
Indeno(1,2,3-c,d)pyrene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/L		-	-	-	0.052	-	-	-	0.37	-	-	0.087	-	-	0.050	1.3	1.3	0.42	-	-
Phenanthrene	µg/L		-	0.026	-	0.015	-	-	-	0.11	-	-	0.016	-	-	0.015	0.071	0.070	-	0.013	-
Pyrene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Quinoline	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-methylnaphthalene	µg/L		-	0.074	-	0.067	-	-	-	0.51	-	-	0.068	-	-	0.054	2.3	2.6	0.33	-	-
PAH, Low Molecular Weight	µg/L		-	0.11	-	0.13	-	-	-	1.1	-	-	0.17	-	-	0.12	3.8	4.1	0.80	-	-
PAH, High Molecular Weight	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, Total	µg/L		-	0.11	-	0.13	-	-	-	1.1	-	-	0.17	-	-	0.12	3.8	4.1	0.80	-	-
Extractable Petroleum Hydrocarbons (C10-C1	µg/L		-	-	-	-	-	-	490	90	-	-	-	-	-	-	130	80	-	-	-
Light Extractable Petroleum Hydrocarbons (C	µg/L		-	-	-	-	-	-	490	89	-	-	-	-	-	-	130	-	-	-	-
Extractable Petroleum Hydrocarbons (C19-C3	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX, VPH,	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (I	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																					
Chloroform	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride	µg/L		-	-	-	-	-	-	-	-	-	-	-	130	-	-	-	-	-	-	-
1,2-dichloroethane	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trihalomethanes (Total)	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total	µg/L		-	-	-	0.52	-	-	-	-	-	-	-	-	-	-	4.7	5.2	-	-	-
o-Xylene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.5	1.6	-	-	-
m,p-Xylenes	µg/L		-	-	-	0.52	-	-	-	-	-	-	-	-	-	-	3.2	3.6	-	-	-
2-Butanone	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	ug/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbons																					
Volatile Hydrocarbon Fraction	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX, VPH,	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment det
> Indicates parameter detected above equipment analytica
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-2: Groundwater Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit																				
Location		K19B-09MW-01	K19B-09MW-01	K19B-09MW-02	K19B-09MW-02	K19B-09MW-02	K19B-09MW-03	K19B-09MW-03	K19B-09MW-04	K19B-09MW-04	K19B-09MW-05	K19B-09MW-05	K19B-09MW-06	K19B-09MW-06	K19B-09MW-07	K19B-09MW-07	K19B-09MW-07	K19B-10MW-12	K19B-10MW-12	K19B-10MW-13
Sample Name			K19B-09MW-01		K19B-09MW-02	MWF		K19B-09MW-03		K19B-09MW-04		K19B-09MW-05		K19B-09MW-06		K19B-09MW-07	K19B-09MW-07	K19B-10MW-12	K19B-10MW-12	K19B-10MW-13
Sample Date		11/4/2009	9/9/2010	11/4/2009	6/19/2016	6/19/2016	11/4/2009	6/19/2016	11/4/2009	6/19/2016	11/4/2009	6/19/2016	11/4/2009	6/19/2016	11/4/2009	9/9/2010	6/9/2016	9/9/2010	6/19/2016	6/19/2016
SYS_SAMPLE_CODE		K19B-09MW-01	W88640	K19B-09MW-02	OW6944	OW6945	K19B-09MW-03	OW6948	K19B-09MW-04	OW6949	K19B-09MW-05	OW6943	K19B-09MW-06	OW6974	K19B-09MW-07	W88641	OU9611	W88638	OW6973	OW6947
PARENT_SAMPLE_CODE						OW6944														
SAMPLE_TYPE_CODE		N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N
FIELD_SDG			B083804		B650178	B650178		B650178		B650178		B650178		B650178		B083804	B646703	B083804	B650178	B650178
PAH																				
Acenaphthene	µg/L	-	-	-	-	-	-	0.83|0.062	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acridine	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/L	-	-	-	-	-	-	0.17	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	µg/L	-	-	-	-	-	-	0.12	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	µg/L	-	-	-	-	-	-	0.035	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	µg/L	-	-	-	-	-	-	0.13	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/L	-	-	-	-	-	-	0.72	-	-	-	-	-	0.034	-	-	-	-	-	-
Benzo(b,j) fluoranthene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	µg/L	-	-	-	-	-	0.07	0.61|0.058	-	-	-	-	-	-	-	0.011	-	0.012	-	-
Indeno(1,2,3-c,d)pyrene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/L	-	-	-	-	-	-	3.3	-	-	-	-	-	-	-	0.063	-	0.066	-	-
Phenanthrene	µg/L	-	0.013	-	-	-	0.08	1.6|0.11	-	-	-	-	-	0.075	-	0.042	-	0.033	-	-
Pyrene	µg/L	-	-	-	-	-	-	0.45	-	-	-	-	-	0.027	-	-	-	-	-	-
Quinoline	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-methylnaphthalene	µg/L	-	-	-	-	-	-	1.2	-	-	-	-	-	-	-	0.080	-	0.090	-	-
PAH, Low Molecular Weight	µg/L	-	-	-	-	-	0.15	7.7	-	-	-	-	-	-	-	0.20	-	0.20	-	-
PAH, High Molecular Weight	µg/L	-	-	-	-	-	-	1.4	-	-	-	-	-	0.061	-	-	-	-	-	-
PAH, Total	µg/L	-	-	-	-	-	0.15	9.2	-	-	-	-	-	-	-	0.20	-	0.20	-	-
Extractable Petroleum Hydrocarbons (C10-C1	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Extractable Petroleum Hydrocarbons (C19-C3	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX, VPH,	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (I	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																				
Chloroform	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	µg/L	0.2	-	0.2	-	-	0.2	-	0.2	-	0.2	-	0.2	-	0.2	-	-	-	-	-
Trihalomethanes (Total)	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total	µg/L	1	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbons																				
Volatile Hydrocarbon Fraction	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX, VPH,	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment det
> Indicates parameter detected above equipment analytica
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-2: Groundwater Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit	Location	K19B-10MW-14	K19B-10MW-14	K19B-10MW-14	K19B-10MW-15	K19B-10MW-15	K19B-10MW-15	K19B-10MW-15	K19B-10MW-16	K19B-10MW-16	K19B-10MW-18	K19B-10MW-18	K19-MW16-01D	K19-MW16-01D	K19-MW16-01D	K19-MW16-01D	K19-MW16-03D	K19-MW16-03D	K19-MW16-03D	K19-MW16-03D
		Sample Name	DUP-01	K19B-10MW-14	K19B-10MW-14	03797-01	K19B-10MW-15	K19B-10MW-15	MWC	K19B-10MW-16	K19B-10MW-16	K19B-10MW-18	K19B-10MW-18	06690-06	3809-03	K19-MW16-01D	K19-MW16-01D	03375-03	3808-05	K19-MW16-03D	K19-MW16-03D
		Sample Date	9/9/2010	9/9/2010	6/19/2016	7/26/2017	9/9/2010	6/9/2016	6/9/2016	9/9/2010	6/9/2016	9/9/2010	6/9/2016	2/8/2017	7/15/2017	3/11/2016	6/17/2016	2/4/2017	7/14/2017	3/15/2016	6/17/2016
		SYS_SAMPLE_CODE	W88643	W88635	OW6946	8601479-03797-01	W88636	OU9609	OU9610	W88637	OU9612	W88642	OU9613	QN9072	8565586-3809-03	OH3620	OW6900	QN4368	8565752-3808-05	OH7528	OW6904
		PARENT_SAMPLE_CODE	W88635						OU9609												
		SAMPLE_TYPE_CODE	FD	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N
		FIELD_SDG	B083804	B083804	B650178	17N243826	B083804	B646703	B646703	B083804	B646703	B083804	B646703	B710365	17N238668	B619935	B650178	B709734	17N238668	B620736	B650178
PAH																					
Acenaphthene	µg/L		-	-	6.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	µg/L		-	-	0.13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acridine	µg/L		-	-	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/L		-	-	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	µg/L		-	-	0.88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	µg/L		-	-	0.27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	µg/L		-	-	0.071	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	µg/L		-	-	0.17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	µg/L		-	-	0.86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/L		0.018	-	5.3	-	0.014	-	-	0.020	-	0.015	-	-	-	-	-	-	-	-	-
Benzo(b,j) fluoranthene	µg/L		-	-	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	µg/L		0.033	-	4.2	-	0.017	-	-	0.028	-	0.031	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	µg/L		-	-	0.066	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/L		0.13	-	24	-	0.056	-	-	0.092	-	0.15	-	-	-	-	-	-	-	-	-
Phenanthrene	µg/L		0.15	0.011	11	-	0.097	-	-	0.15	-	0.14	-	-	-	-	-	-	-	-	-
Pyrene	µg/L		0.032	-	3.3	-	0.023	-	-	0.034	-	0.027	-	-	-	-	-	-	-	-	-
Quinoline	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-methylnaphthalene	µg/L		0.26	-	8.6	-	0.14	-	-	0.26	-	0.27	-	-	-	-	-	-	-	-	-
PAH, Low Molecular Weight	µg/L		0.57	-	56	-	0.31	-	-	0.53	-	0.58	-	-	-	-	-	-	-	-	-
PAH, High Molecular Weight	µg/L		0.050	-	11	-	0.037	-	-	0.054	-	0.042	-	-	-	-	-	-	-	-	-
PAH, Total	µg/L		0.62	-	67	-	0.35	-	-	0.59	-	0.62	-	-	-	-	-	-	-	-	-
Extractable Petroleum Hydrocarbons (C10-C1	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Extractable Petroleum Hydrocarbons (C19-C3	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX, VPH,	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (I	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																					
Chloroform	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trihalomethanes (Total)	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	0.5	-	-	-	-	-	-
Ethylbenzene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.1	-
Xylenes, Total	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	ug/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbons																					
Volatile Hydrocarbon Fraction	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX, VPH,	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment det
> Indicates parameter detected above equipment analytica
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-2: Groundwater Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit	Location	K19-MW16-03S	K19-MW16-05	K19-MW16-05	K19-MW16-07D	K19-MW16-07D	K19-MW16-07D	K19-MW16-07D	K19-MW16-07S	K19-MW16-07S	K19-MW16-10D	K19-MW16-10D	K19-MW16-10D	K19-MW16-10S	K19-MW16-10S	K19-MW16-10S	K19-MW16-11	K19-MW16-11	K19-MW16-12D	K19-MW16-12D
		Sample Name	K19-MW16-03S	03816-02	K19-MW16-05	03815-03	03815-04	K19-MW16-07D	K19-MW16-07D	03797-07	K19-MW16-07S	3808-01	K19-MW16-10D	K19-MW16-10D	3808-02	K19-MW16-10S	K19-MW16-10S	K19-MW16-11	K19-MW16-11	3808-03	K19-MW16-12D
		Sample Date	6/17/2016	7/21/2017	6/18/2016	7/20/2017	7/20/2017	3/14/2016	6/18/2016	7/26/2017	6/19/2016	7/13/2017	3/15/2016	6/17/2016	7/13/2017	3/18/2016	6/17/2016	3/16/2016	6/19/2016	7/13/2017	3/16/2016
		SYS_SAMPLE_CODE	OW6905	8590124-03816-02	OW6906	8590015-03815-03	8590019-03815-04	OH7523	OW6941	8601486-03797-07	OW6942	8565629-3808-01	OH7525	OW6899	8565632-3808-02	OI2306	OW6902	OI2300	OW6972	8565682-3808-03	OI2301
		PARENT_SAMPLE_CODE					8590015-03815-03														
		SAMPLE_TYPE_CODE	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N
		FIELD_SDG	B650178	17N242036	B650178	17N242036	17N242036	B620736	B650178	17N243826	B650178	17N238668	B620736	B650178	17N238668	B621590	B650178	B621590	B650178	17N238668	B621590
PAH																					
Acenaphthene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acridine	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j) fluoranthene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Quinoline	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-methylnaphthalene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, Low Molecular Weight	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, High Molecular Weight	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, Total	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Extractable Petroleum Hydrocarbons (C10-C1	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Extractable Petroleum Hydrocarbons (C19-C3	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX, VPH,	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (I	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC																					
Chloroform	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trihalomethanes (Total)	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	ug/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbons																					
Volatile Hydrocarbon Fraction	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX, VPH,	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment det
> Indicates parameter detected above equipment analytica
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-2: Groundwater Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit	Location	K19-MW16-12D	K19-MW16-12S	K19-MW16-12S	K19-MW16-12S	K19-MW16-13	K19-MW16-13	K19-MW16-13-DUP	K19-MW17-05	K19-MW17-05	K19-MW17-06	K19-MW17-06	K19-MW17-07	K19-MW17-07	K19-MW17-09	K19-MW17-10	K19-MW17-11	K19-MW17-11	K19-MW17-12	K19-MW17-12
		Sample Name	K19-MW16-12D	3808-04	K19-MW16-12S	K19-MW16-12S	K19-MW16-13	K19-MW16-13	K19-MW16-13-DUP	03375-07	03798-01	03815-05	06689-06	03815-02	06690-01	03765-02	03765-01	03830-01	06706-02	03815-01	06690-08
		Sample Date	6/17/2016	7/13/2017	3/18/2016	6/17/2016	3/17/2016	6/8/2016	3/17/2016	2/5/2017	7/27/2017	7/20/2017	2/6/2017	7/20/2017	2/7/2017	7/25/2017	7/25/2017	7/16/2017	2/8/2017	7/20/2017	2/9/2017
		SYS_SAMPLE_CODE	OW6901	8565715-3808-04	OI2307	OW6903	OI2303	OU9527	OI2305	QN4372	8601487-03798-01	8590020-03815-05	QN4593	8590013-03815-02	QN9067	8598916-03765-02	8598915-03765-01	8582939-03830-01	QN9113	8590011-03815-01	QN9074
		PARENT_SAMPLE_CODE							OI2303												
		SAMPLE_TYPE_CODE	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N
		FIELD_SDG	B650178	17N238668	B621590	B650178	B621590	B646703	B621590	B709734	17N243826	17N242036	B709775	17N242036	B710365	17N243343	17N243343	17N240971	B710365	17N242036	B710365
PAH																					
Acenaphthene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acridine	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	µg/L		-	-	-	-	-	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	µg/L		-	-	-	-	-	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j) fluoranthene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/L		-	-	-	-	-	-	-	-	-	0.05	-	-	0.12	-	-	-	-	0.06	0.14
Phenanthrene	µg/L		-	-	-	-	-	-	-	-	-	0.09	0.059	-	-	-	-	-	-	-	-
Pyrene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Quinoline	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-methylnaphthalene	µg/L		-	-	-	-	-	-	-	-	-	0.08	0.11	-	-	-	-	-	-	-	-
PAH, Low Molecular Weight	µg/L		-	-	-	-	-	-	-	-	-	-	0.17	-	0.12	-	-	-	-	-	0.14
PAH, High Molecular Weight	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, Total	µg/L		-	-	-	-	-	-	-	-	-	-	0.17	-	0.12	-	-	-	-	-	0.14
Extractable Petroleum Hydrocarbons (C10-C1	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Extractable Petroleum Hydrocarbons (C19-C3	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX, VPH,	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (I	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	µg/L		-	-	-	-	-	-	-	-	-	0.06	-	-	-	-	-	-	-	-	-
VOC																					
Chloroform	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trihalomethanes (Total)	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/L		-	-	0.84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	ug/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbons																					
Volatile Hydrocarbon Fraction	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX, VPH,	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment det
> Indicates parameter detected above equipment analytica
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-2: Groundwater Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit	Location	K19-MW17-13	K19-MW17-13	K19-MW17-13	K19-MW17-17	K19-MW17-18	K19-MW17-19	K19-MW17-20	K19-MW17-21	K19-MW17-21	K19-MW17-22	K19-MW17-23	K19-MW17-24	K19-MW17-24	K19-MW17-25	K19-MW17-26	K19-MW17-27	K19-MW17-28	K19-MW17-29D	K19-MW17-29S
		Sample Name	03830-04	06690-04	06690-05	03797-02	03797-03	03765-03	03765-06	03765-04	03765-05	03762-04	03762-03	03797-04	03797-05	03797-06	03763-04	03798-02	03798-03	03762-07	03763-05
		Sample Date	7/16/2017	2/8/2017	2/8/2017	7/26/2017	7/26/2017	7/25/2017	7/25/2017	7/25/2017	7/25/2017	7/28/2017	7/28/2017	7/26/2017	7/26/2017	7/26/2017	7/30/2017	7/27/2017	7/27/2017	7/28/2017	7/30/2017
		SYS_SAMPLE_CODE	8582959-03830-04	QN9070	QN9071	8601480-03797-02	8601482-03797-03	8598917-03765-03	8599005-03765-06	8598918-03765-04	8598919-03765-05	8604418-03762-04	8604416-03762-03	8601483-03797-04	8601484-03797-05	8601485-03797-06	8604456-03763-04	8601488-03798-02	8601489-03798-03	8604432-03762-07	8604457-03763-05
		PARENT_SAMPLE_CODE			QN9070						8598918-03765-04				8601483-03797-04						
		SAMPLE_TYPE_CODE	N	N	FD	N	N	N	N	N	FD	N	N	N	FD	N	N	N	N	N	N
		FIELD_SDG	17N240971	B710365	B710365	17N243826	17N243826	17N243343	17N243343	17N243343	17N243343	17N244304	17N244304	17N243826	17N243826	17N243826	17N244304	17N243826	17N243826	17N244304	17N244304
PAH																					
Acenaphthene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acridine	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j) fluoranthene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.21
Indeno(1,2,3-c,d)pyrene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/L		-	0.30	0.32	-	-	-	-	0.06	0.06	-	0.15	-	-	-	0.06	-	-	-	23.5
Phenanthrene	µg/L		-	0.076	0.079	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.07
Pyrene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Quinoline	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-methylnaphthalene	µg/L		-	0.33	0.32	-	-	-	-	-	-	-	0.11	-	-	-	-	-	-	-	5.99
PAH, Low Molecular Weight	µg/L		-	0.70	0.72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, High Molecular Weight	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH, Total	µg/L		-	0.70	0.72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Extractable Petroleum Hydrocarbons (C10-C1	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	650
Light Extractable Petroleum Hydrocarbons (C	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Extractable Petroleum Hydrocarbons (C19-C3	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX, VPH,	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
Volatile Hydrocarbon Fraction	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	170
Petroleum Hydrocarbons - F2 (C10-C16)	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	610
Petroleum Hydrocarbons - F3 (C16-C34)	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	140
Heavy Extractable Petroleum Hydrocarbons (I	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	630
1-Methylnaphthalene	µg/L		-	-	-	-	-	-	-	-	-	-	0.09	-	-	-	-	-	-	-	11.7
VOC																					
Chloroform	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
1,2-dichloropropane (Propylene Dichloride)	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trihalomethanes (Total)	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	53.8
Ethylbenzene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.3
Toluene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6
Xylenes, Total	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
o-Xylene	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.1
2-Butanone	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19
Acetone	ug/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58
Volatile Hydrocarbons																					
Volatile Hydrocarbon Fraction	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	170
Volatile Petroleum Hydrocarbons: BTEX, VPH,	µg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100

< Indicates parameter was below laboratory equipment det
> Indicates parameter detected above equipment analytica
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-2: Groundwater Petroleum Hydrocarbon Detections - K19 - Trutch Former Townsite Alaska Highway, BC

	Location	K19-MW17-30	K19-MW17-31	K19-MW17-32	K19-MW17-33	K19-MW17-34	K19-MW17-35D	K19-MW17-35D	K19-MW17-35S	Pink MTN Sa1
	Sample Name	03762-01	03762-02	03798-04	03762-05	03762-06	03763-01	03763-02	03763-06	DRILL WATER/PINKMTN/SAL
	Sample Date	7/28/2017	7/29/2017	7/27/2017	7/28/2017	7/28/2017	7/29/2017	7/29/2017	7/30/2017	3/8/2016
	SYS_SAMPLE_CODE	8604383-03762-01	8604393-03762-02	8601490-03798-04	8604425-03762-05	8604429-03762-06	8604451-03763-01	8604452-03763-02	8604470-03763-06	OG3770
	PARENT_SAMPLE_CODE							8604451-03763-01		
	SAMPLE_TYPE_CODE	N	N	N	N	N	N	FD	N	N
	FIELD_SDG	17N244304	17N244304	17N243826	17N244304	17N244304	17N244304	17N244304	17N244304	B618204
Parameter	Unit									
PAH										
Acenaphthene	µg/L	-	-	-	-	-	-	-	-	-
Acenaphthylene	µg/L	-	-	-	-	-	-	-	-	-
Acridine	µg/L	-	-	-	-	-	-	-	-	-
Anthracene	µg/L	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	µg/L	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	µg/L	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	µg/L	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	µg/L	-	-	-	-	-	-	-	-	-
Chrysene	µg/L	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/L	-	-	-	-	-	-	-	-	-
Benzo(b,j) fluoranthene	µg/L	-	-	-	-	-	-	-	-	-
Fluorene	µg/L	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	µg/L	-	-	-	-	-	-	-	-	-
Naphthalene	µg/L	-	0.05	-	-	-	-	-	-	0.36
Phenanthrene	µg/L	-	-	-	-	-	-	-	-	-
Pyrene	µg/L	-	-	-	-	-	-	-	-	-
Quinoline	µg/L	-	-	-	-	-	-	-	-	-
2-methylnaphthalene	µg/L	-	-	-	-	-	-	-	0.05	-
PAH, Low Molecular Weight	µg/L	-	-	-	-	-	-	-	-	0.36
PAH, High Molecular Weight	µg/L	-	-	-	-	-	-	-	-	-
PAH, Total	µg/L	-	-	-	-	-	-	-	-	0.36
Extractable Petroleum Hydrocarbons (C10-C1	µg/L	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C	µg/L	-	-	-	-	-	-	-	-	-
Extractable Petroleum Hydrocarbons (C19-C3	µg/L	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX, VPH,	µg/L	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbon Fraction	µg/L	-	-	-	-	-	640	630	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	µg/L	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	µg/L	-	-	-	-	-	-	-	-	-
Heavy Extractable Petroleum Hydrocarbons (I	µg/L	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (BC	µg/L	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	µg/L	-	-	-	-	-	-	-	-	-
VOC										
Chloroform	µg/L	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride	µg/L	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	µg/L	-	-	-	-	-	121	122	1	-
1,2-dichloropropane (Propylene Dichloride)	µg/L	-	-	-	-	-	2	2	-	-
1,1,2,2-tetrachloroethane	µg/L	-	-	-	-	-	-	-	-	-
Trihalomethanes (Total)	µg/L	-	-	-	-	-	-	-	-	-
Benzene	µg/L	-	-	-	-	-	574	569	17.3	-
Ethylbenzene	µg/L	-	-	-	-	-	0.5	0.5	0.5	-
Toluene	µg/L	-	-	-	-	-	20.0	20.2	-	-
Xylenes, Total	µg/L	-	-	-	-	-	1	1	-	-
o-Xylene	µg/L	-	-	-	-	-	0.5	0.5	-	-
m,p-Xylenes	µg/L	-	-	-	-	-	0.8	0.9	-	-
2-Butanone	µg/L	-	-	-	-	-	-	-	-	-
Acetone	ug/L	-	-	-	-	-	-	-	-	-
Volatile Hydrocarbons										
Volatile Hydrocarbon Fraction	µg/L	-	-	-	-	-	640	630	-	-
Volatile Petroleum Hydrocarbons: BTEX, VPH,	µg/L	-	-	-	-	-	-	-	-	-

< Indicates parameter was below laboratory equipment det
> Indicates parameter detected above equipment analytica
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-3: Soil Standards Based on Vapour Standards - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	CSR Vapour Standards [1] RL ($\mu g/m^3$)	Notes	Outdoor Air Attenuation Factor[2]	Maximum Soil Concentration [3] (mg/kg)	Henry's Law Constant [4]	Koc [4] (mL/g)	Notes
Acetone	**2000**		1.0E-04	**4.64E+02**	1.62E-03	5.8E-01	
Bromodichloromethane	**40**		1.0E-04	**1.76E+00**	8.67E-02	5.5E+01	
Chlorobenzene	**10**		1.0E-04	**1.09E+00**	1.27E-01	2.2E+02	
Chloroform	**100**		1.0E-04	**2.03E+00**	1.50E-01	4.0E+01	
Dichloromethane	**600**		1.0E-04	**1.02E+01**	1.33E-01	2.75E+01	5,6
1,2-Dibromoethane	**0.5**		1.0E-04	**5.55E-02**	2.73E-02	4.4E+01	
1,1-Dichloroethane	**500**		1.0E-04	**5.91E+00**	2.30E-01	3.2E+01	
1,2-Dichloroethane	**7**		1.0E-04	**2.11E-01**	4.82E-02	1.7E+01	
1,2-Dichloropropane	**4**		1.0E-04	**1.12E-01**	1.15E-01	4.4E+01	
trans-1,3-Dichloropropylene	**2.5**		1.0E-04	**5.84E-02**	1.45E-01	4.6E+01	
1,1,2,2-Tetrachloroethane	**40**		1.0E-04	**1.59E+01**	1.50E-02	9.3E+01	
1,1,2-Trichloroethane	**0.5**		1.0E-04	**5.05E-02**	3.37E-02	5.0E+01	
Trichloroethylene	**2**		1.0E-04	**3.55E-02**	4.03E-01	1.0E+02	5
benzene	**1.5**		1.0E-04	**2.86E-02**	2.27E-01	5.9E+01	
Toluene	**5000**		1.0E-04	**2.16E+02**	2.71E-01	1.8E+02	
Ethylbenzene	**1000**		1.0E-04	**7.01E+01**	3.22E-01	3.6E+02	
Xylene	**100**		1.0E-04	**9.40E+00**	2.71E-01	4.1E+02	
Naphthalene	**3**		1.0E-04	**1.21E+01**	1.80E-02	1.2E+03	
Styrene	**1000**		1.0E-04	**4.23E+02**	1.12E-01	7.8E+02	
1,2,4-Trichlorobenzene	**7**		1.0E-04	**1.31E+01**	5.81E-02	1.8E+03	
VPH + LEPH**	**1000**		1.0E-04	**1.91E+02**	5.10E-01	1.6E+03	
LEPH			1.0E-04		5.7E-02	2.5E+03	

Notes:

1 - Vapour standards are from the British Columbia Contaminated Sites Regulation (CSR; B.C. Reg. 375/96) Schedule 3.3 of Omnibus; includes amendments up to B.C. Reg. 253/2016, October 27, 2016 and BC Reg. 196/2017, updated to 1 November 2017.

2 - Applied attenuation factors (α) obtained from Table 1 of BC Ministry of Environment Protocol #22 - Application of Vapour Attenuation Factors to Characterize Vapour Contamination (Effective November 1, 2017). For preliminary assessment, sample depth is assumed to be <1.0 m.

3 - Soil concentrations for the vapour pathway were calculated using the formula provided in Exhibit 2 of Health Canada (2010) Federal Contaminated Site Risk Assessment in Canada Part VII: Guidance for Soil Vapour Intrusion Assessment at Contaminated Sites.

4 - Henry's Law constant and K_{oc} values obtained from CSR Protocol 13, Table A-1 unless indicated otherwise. If not available in CSR Protocol 13, the US EPA RAIS database K_{oc} values were selected in order of (experimental, MCI (molecular connectivity index), estimated) and source order (EPI, SSL)

5 - Koc value obtained from the US EPA RAIS database. Values were selected in order of (experimental, MCI (molecular connectivity index), estimated) and source order (EPI, SSL).

6 - Henry's Law constant value obtained from the US EPA RAIS database. Values were selected in order of (experimental, MCI (molecular connectivity index), estimated) and source order (EPI, SSL).

** The sum of soil vapour partitioning calculations from LEPH and VPH concentrations in soil is used to estimate the VPHv concentration in soil vapour. It was assumed that Csoil is less than Csoil,sat for all parameters.

The input parameters used are specific to coarse soil. For the purposes of modelling, it was assumed that the material consists of coarse soil.

EPI - The EPI (Estimation Programs Interface) SuiteTM is a Windows-based suite of physical/chemical property and environmental fate estimation programs developed by the EPA's Office of Pollution Prevention Toxics and Syracuse Research Corporation (SRC)

SLI - Soil Screening Guidance: User's Guide. EPA Document Number: EPA540/R-96/018. July 1996. Attachment C: Chemical Properties for SSL Development.

LEPH - light extractable petroleum hydrocarbons

VPH - volatile petroleum hydrocarbons

VPHv - volatile petroleum hydrocarbons in vapour

CSR - contaminated sites regulation

RL - Residential Land Use

Soil Partitioning Formula

$C_{v,i} = UCF_2 * C_{soil,i} * H' * \rho_b / (\theta_w + K_{oc} * f_{oc} * \rho_b + H' * \theta_a)$

Key to Symbols	Default Value	Units
θ_w = water filled porosity	0.054	Unitless
θ_a = air filled porosity	0.321	Unitless
ρ_b = dry bulk density	1.6	kg/L
UCF_2 = unit conversion factor	1000	L/m^3
$C_{v,i}$ = soil vapour concentration	na	mg/m^3
f_{oc} = fraction of organic carbon	0.006	
H' = Henry's Law Constant	na	Unitless
$C_{soil,i}$ = soil concentration	na	mg/kg
K_{oc} = organic carbon-water partitioning coefficient	na	mL/g

Table J-4: Groundwater Standards Based on Soil Vapour Standards - K19 - Trutch Former Townsite Alaska Highway, BC

Parameters	CSR Vapour Standards [1] RL (µg/m3)	Notes	Outdoor Air Attenuation Factor[2]	Maximum Allowable Concentration in Water (mg/L) [3]	Henry's Law Constant [4]
Acetone	**2000**		1.0E-04	**1.23E+04**	1.62E-03
Chloroform	**100**		1.0E-04	**6.67E+00**	1.50E-01
1,2-Dichloroethane	**7**		1.0E-04	**3.04E-01**	2.30E-01
1,2-Dichloropropane	**4**		1.0E-04	**3.48E-01**	1.15E-01
Naphthalene	**3**		1.0E-04	**1.67E+00**	1.80E-02
MTBE	**3000**		1.0E-04	**1.25E+03**	2.40E-02
VPH+LEPH**	**1000**		1.0E-04	**1.96E+01**	5.10E-01
Ethylbenzene	**1000**		1.0E-04	**3.11E+01**	3.22E-01
Benzene	**1.5**		1.0E-04	**6.61E-02**	2.27E-01
Toluene	**5000**		1.0E-04	**1.85E+02**	2.71E-01
Xylenes	**100**		1.0E-04	**3.69E+00**	2.71E-01
Styrene	**1000**		1.0E-04	**8.93E+01**	1.12E-01

Notes:

1 - Vapour standards are from the British Columbia Contaminated Sites Regulation (CSR; B.C. Reg. 375/96) Schedule 3.3 of Omnibus; includes amendments up to B.C. Reg. 253/2016, October 27, 2016 and BC Reg. 196/2017, updated to 1 November 2017.

2 - Applied attenuation factors (α) obtained from Table 1 of BC Ministry of Environment Protocol #22 - Application of Vapour Attenuation Factors to Characterize Vapour Contamination (Effective November 1, 2017). For preliminary assessment, sample depth is assumed to be <1.0 m.

3 - Groundwater concentrations for the vapour pathway were calculated using the formula provided in Exhibit 2 of Health Canada (2010) Federal Contaminated Site Risk Assessment in Canada Part VII: Guidance for Soil Vapour Intrusion Assessment at Contaminated Sites.

4 - Henry's Law constant obtained from CSR Protocol 13, Table A-1 unless indicated otherwise.

It is assumed that the groundwater is less than the molar fraction solubility

* Predicted soil vapour concentrations (without attenuation) are shown for reference only and are not compared to the vapour standards.

** The sum of soil vapour partitioning calculations from LEPH and VPH concentrations in groundwater is used to estimate VPHv in soil vapour.

LEPH - light extractable petroleum hydrocarbons

VPH - volatile petroleum hydrocarbons

VPHv - volatile petroleum hydrocarbons in vapour

CSR - contaminated sites regulation

RL - Residential Land Use

Groundwater Partitioning Formula

$$Cv = UCF_2 * Cw * H'$$

Where:

Cw = concentration in groundwater (mg/L) and is based on Site-specific data

H' = dimensionless Henry's Law Constant (unitless) for the compound modeled

UCF_2 = unit conversion factor (L/m^3) of 1000

Cv = concentration in soil vapour (mg/m^3)

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Maximum Allowable Soil Concentration	Unit	Location	K19-10TP-03	K19-10TP-05	K19-10TP-09	K19-10TP-11	K19-10TP-12	K19-10TP-13	K19-10TP-17	K19-10TP-17	K19-10TP-18	K19-10TP-22	K19-10TP-23	K19-10TP-24	K19-10TP-30	K19-10TP-31	K19-10TP-35
			Sample Name	K19-10TP-03-3	K19-10TP-05-2	K19-10TP-09-5	K19-10TP-11-2	K19-10TP-12-4	K19-10TP-13-3	K19-10TP-17-5	K19-10TP-DUP-2	K19-10TP-18-2	K19-10TP-22-6	K19-10TP-23-5	K19-10TP-24-6	K19-10TP-30-5	K19-10TP-31-6	K19-10TP-35-1
			Sample Date	8/5/2010	8/5/2010	8/5/2010	8/5/2010	8/6/2010	8/6/2010	8/6/2010	8/6/2010	8/6/2010	8/7/2010	8/7/2010	8/7/2010	8/8/2010	8/8/2010	8/8/2010
			Sample Depth	0.3-0.91 m	0.3-0.91 m	1.83-2.13 m	0.3-0.6 m	2.15-2.45 m	1.2-1.5 m	2.75-3.05 m	2.75-3.05 m	0.9-1.2 m	2.75-3.05 m	2.15-2.45 m	3.35-3.65 m	2.75-3 m	3.65-3.95 m	0-0.3 m
			SYS_SAMPLE_CODE	W04971	W04969	W04966	W04963	W07745	W07744	W07743	W07746	W07742	W07748	W07749	W07750	W07751	W07752	W07753
			PARENT_SAMPLE_CODE								W07743							
			SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N
			FIELD_SDG	B068158	B068158	B068158	B068158	B068605	B068605	B068605	B068605	B068605	B068605	B068605	B068605	B068605	B068605	B068605
PAH																		
Naphthalene	**1.21E+01**	mg/kg		-	< 0.14	1.0	0.27	**29**	< 0.30	-	-	0.48	1.2	**16**	5.3	-	0.17	0.0048
VOC																		
Bromodichloromethane (BDCM)	1.76E+00	mg/kg		-	-	-	-	-	-	< 0.050	< 0.050	-	-	-	-	-	-	-
Chlorobenzene	1.09E+00	mg/kg		-	-	-	-	-	-	< 0.025	< 0.025	-	-	-	-	-	-	-
Chloroform	2.03E+00	mg/kg		-	-	-	-	-	-	< 0.050	< 0.050	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg		-	-	-	-	-	-	< 0.10	< 0.26	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg		-	-	-	-	-	-	**< 0.15**	**< 0.25**	-	-	-	-	-	-	-
1,1-dichloroethane	5.91E+00	mg/kg		-	-	-	-	-	-	< 0.025	< 0.025	-	-	-	-	-	-	-
1,2-dichloroethane	2.11E-01	mg/kg		-	-	-	-	-	-	< 0.16	< 0.19	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg		-	-	-	-	-	-	< 0.025	< 0.025	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	5.84E-02	mg/kg		-	-	-	-	-	-	< 0.050	< 0.050	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg		-	-	-	-	-	-	< 0.025	< 0.025	-	-	-	-	-	-	-
1,1,2-trichloroethane	**5.05E-02**	mg/kg		-	-	-	-	-	-	< 0.025	< 0.025	-	-	-	-	-	-	-
Trichloroethylene (TCE)	3.55E-02	mg/kg		-	-	-	-	-	-	< 0.010	< 0.010	-	-	-	-	-	-	-
Benzene	**2.86E-02**	mg/kg		< 0.0050	-	-	-	-	-	**1.7**	**2.3**	-	-	-	-	< 0.0050	-	-
Toluene	2.16E+02	mg/kg		< 0.020	-	-	-	-	-	2.3	3.0	-	-	-	-	< 0.020	-	-
Ethylbenzene	7.01E+01	mg/kg		< 0.010	-	-	-	-	-	8.7	9.6	-	-	-	-	< 0.010	-	-
Xylenes, Total	**9.40E+00**	mg/kg		< 0.040	-	-	-	-	-	**14**	**16**	-	-	-	-	< 0.040	-	-
Styrene	4.23E+02	mg/kg		< 0.030	-	-	-	-	-	< 0.10	< 0.10	-	-	-	-	< 0.030	-	-
1,2,4-Trichlorobenzene	1.31E+01	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	4.64E+02	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Maximum Allowable Soil Concentration	Unit															
Location			K19-10TP-35	K19-10TP-36	K19-10TP-38	K19-10TP-39	K19-10TP-41	K19-10TP-42	K19-10TP-43	K19-16-22	K19A-09MW-02	K19A-09MW-03	K19A-09MW-03	K19A-09MW-04	K19A-09MW-04	K19A-09MW-04	K19A-09MW-05
Sample Name			K19-10TP-DUP-3	K19-10TP-36-1	K19-10TP-38-1	K19-10TP39-4	K19-10TP-41-4	K19-10TP-42-6	K19-10TP-43-2	01481-04							
Sample Date			8/8/2010	8/8/2010	8/8/2010	8/9/2010	8/9/2010	8/9/2010	8/9/2010	8/30/2016	10/20/2009	10/20/2009	10/22/2009	10/20/2009	10/21/2009	10/21/2009	10/21/2009
Sample Depth			0-0.3 m	0-0.3 m	0.3-0.6 m	2.15-2.45 m	2.15-2.45 m	2.75-3.05 m	0.6-0.9 m	2-2 m	0.6-1.2 m	0-0.6 m	4.3-4.9 m	1.8-2.4 m	1.8-2.4 m	6.7-7.9 m	0-0.6 m
SYS_SAMPLE_CODE			W07866	W07865	W07867	W10033	W10034	W10035	W10038	PK6755	K19A-09BH-02-2	K19A-09BH-03-1	K19A-09BH-03-6	K19A-09BH-04-3	09-DUP-01	K19A-09BH-04-7	09-DUP-02
PARENT_SAMPLE_CODE			W07753												K19a-09BH-04-3		K19a-09BH-05-1
SAMPLE_TYPE_CODE			FD	N	N	N	N	N	N	N	N	N	N	N	FD	N	FD
FIELD_SDG			B068605	B068605	B068605	B069119	B069119	B069119	B069119	B675549							
PAH																	
Naphthalene	**1.21E+01**	mg/kg	0.0021	0.0056	0.0056	0.010	0.0060	-	0.026	< 0.010	< 0.05	< 0.05	-	< 0.05	< 0.05	0.17	< 0.05
VOC																	
Bromodichloromethane (BDCM)	1.76E+00	mg/kg	-	-	-	-	-	< 0.050	-	-	-	-	-	-	-	< 0.03	-
Chlorobenzene	1.09E+00	mg/kg	-	-	-	-	-	< 0.025	-	-	-	-	-	-	-	< 0.03	-
Chloroform	2.03E+00	mg/kg	-	-	-	-	-	< 0.050	-	-	-	-	-	-	-	< 0.03	-
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg	-	-	-	-	-	< 0.10	-	-	-	-	-	-	-	< 0.1	-
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg	-	-	-	-	-	**< 0.057**	-	-	-	-	-	-	-	< 0.03	-
1,1-dichloroethane	5.91E+00	mg/kg	-	-	-	-	-	< 0.025	-	-	-	-	-	-	-	< 0.03	-
1,2-dichloroethane	2.11E-01	mg/kg	-	-	-	-	-	< 0.025	-	-	-	-	-	-	-	< 0.06	-
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg	-	-	-	-	-	< 0.025	-	-	-	-	-	-	-	< 0.03	-
1,3-dichloropropene (Trans)	5.84E-02	mg/kg	-	-	-	-	-	< 0.050	-	-	-	-	-	-	-	< 0.03	-
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg	-	-	-	-	-	< 0.025	-	-	-	-	-	-	-	< 0.03	-
1,1,2-trichloroethane	**5.05E-02**	mg/kg	-	-	-	-	-	< 0.025	-	-	-	-	-	-	-	< 0.03	-
Trichloroethylene (TCE)	3.55E-02	mg/kg	-	-	-	-	-	< 0.010	-	-	-	-	-	-	-	< 0.01	-
Benzene	**2.86E-02**	mg/kg	-	-	-	-	-	**1.3**	-	< 0.0050	**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**
Toluene	2.16E+02	mg/kg	-	-	-	-	-	< 0.046	-	< 0.020	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	7.01E+01	mg/kg	-	-	-	-	-	4.3	-	< 0.010	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes, Total	**9.40E+00**	mg/kg	-	-	-	-	-	7.9	-	< 0.040	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Styrene	4.23E+02	mg/kg	-	-	-	-	-	< 0.10	-	< 0.030	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2,4-Trichlorobenzene	1.31E+01	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	4.64E+02	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Maximum Allowable Soil Concentration	Unit	Location	K19A-09MW-05	K19A-09MW-05	K19A-09MW-05	K19A-09MW-06	K19A-10BH-08	K19A-10BH-23	K19A-10MW-03	K19A-10MW-03	K19A-10MW-04	K19A-10MW-04	K19A-10MW-04	K19A-10MW-05	K19A-10MW-05	K19A-10MW-06	K19A-10MW-07
			Sample Name					K19A-10BH-08-3	K19A-10BH-23-6	K19A-10MW-03-	K19A-10MW-	K19A-10MW-04-	K19A-10MW-04-	K19A-10MW-04-	K19A-10MW-05-	K19-DUP-2	K19A-10MW-06-	K19A-10MW-07-
			Sample Date	10/21/2009	10/21/2009	10/21/2009	10/22/2009	8/15/2010	8/23/2010	8/13/2010	8/13/2010	8/14/2010	8/14/2010	8/14/2010	8/14/2010	8/14/2010	8/15/2010	8/15/2010
			Sample Depth	0-0.6 m	1.8-2.4 m	6.4-7 m	6.7-7.3 m	2.1-2.4 m	2.6-2.74 m	1.22-1.52 m	1.22-1.52 m	2.6-2.75 m	3.8-4 m	4.6-4.8 m	2.4-2.7 m	2.4-2.7 m	3.05-3.35 m	2.6-2.9 m
			SYS_SAMPLE_CODE	K19A-09BH-05-1	K19A-09BH-05-4	K19A-09BH-05-8	K19A-09BH-06-8	W32109	W49067	W32462	W32490	W32038	W32040	W32041	W32044	W32056	W32095	W32099
			PARENT_SAMPLE_CODE								W32462					W32044		
			SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	FD	N	N	N	N	FD	N	N
			FIELD_SDG					B073313	B076441	B073372	B073372	B073302	B073302	B073302	B073302	B073302	B073313	B073313
PAH																		
Naphthalene	**1.21E+01**	mg/kg		< 0.05	< 0.05	0.16	-	-	0.031	-	-	-	< 0.12	-	-	-	-	-
VOC																		
Bromodichloromethane (BDCM)	1.76E+00	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	1.09E+00	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	2.03E+00	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	5.91E+00	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	2.11E-01	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	5.84E-02	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	**5.05E-02**	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	3.55E-02	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	**2.86E-02**	mg/kg		**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050	0.012	0.0097	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Toluene	2.16E+02	mg/kg		< 0.5	< 0.5	< 0.5	< 0.5	< 0.020	-	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Ethylbenzene	7.01E+01	mg/kg		< 0.5	< 0.5	< 0.5	< 0.5	< 0.010	-	< 0.010	< 0.010	< 0.010	0.020	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Xylenes, Total	**9.40E+00**	mg/kg		< 0.1	< 0.1	< 0.1	< 0.1	< 0.040	-	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Styrene	4.23E+02	mg/kg		< 0.1	< 0.1	< 0.1	< 0.1	< 0.030	-	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030
1,2,4-Trichlorobenzene	1.31E+01	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	4.64E+02	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Maximum Allowable Soil Concentration	Unit	Location	K19A-10MW-07	K19A-10MW-09	K19A-10MW-09	K19A-10MW-21	K19A-10MW-21	K19A-10MW-22	K19A-10MW-22	K19A-10MW-22	K19A-10MW-22	K19A-10MW-24	K19A-10MW-24	K19A-10MW-24	K19A-10MW-24	K19A-10MW-25	K19A-10MW-27
			Sample Name	K19A-10MW-	K19A-10MW-09-	K19A-DUP-4	K19A-10MW-21-	K19A-10MW-21-	K19A-10MW-22-	K19A-10MW-22-	K19A-10MW-22-	K19-DUP-13	K19A-10MW-24-	K19A-10MW-24-	K19A-10MW-24-	K19A-DUP-14	K19A-10MW-25-	K19A-10MW-27-
			Sample Date	8/15/2010	8/16/2010	8/16/2010	8/22/2010	8/22/2010	8/22/2010	8/22/2010	8/22/2010	8/22/2010	8/24/2010	8/24/2010	8/24/2010	8/24/2010	8/24/2010	8/25/2010
			Sample Depth	2.6-2.9 m	2.3-2.6 m	2.3-2.6 m	2.45-2.75 m	3.8-3.95 m	0.1-0.45 m	1.2-1.5 m	3.95-4.25 m	1.2-1.5 m	0.31-0.61 m	2.44-2.74 m	3.05-3.35 m	3.05-3.35 m	2.44-2.92 m	1.7-2.15 m
			SYS_SAMPLE_CODE	W32102	W31964	W31920	W48635	W48638	W48640	W48642	W48645	W48647	W49069	W49073	W49074	W49075	W49078	W54446
			PARENT_SAMPLE_CODE	W32099		W31964						W48642				W49074		
			SAMPLE_TYPE_CODE	FD	N	FD	N	N	N	N	N	FD	N	N	N	FD	N	N
			FIELD_SDG	B073313	B073270	B073270	B076365	B076365	B076365	B076365	B076365	B076365	B076441	B076441	B076441	B076441	B076441	B077440
PAH																		
Naphthalene	**1.21E+01**	mg/kg		-	-	-	0.022	0.25	-	< 0.19	0.23	-	-	0.053	0.19	0.37	0.016	0.027
VOC																		
Bromodichloromethane (BDCM)	1.76E+00	mg/kg		-	-	-	-	-	< 0.050	-	-	< 0.050	-	-	-	-	-	-
Chlorobenzene	1.09E+00	mg/kg		-	-	-	-	-	< 0.025	-	-	< 0.025	-	-	-	-	-	-
Chloroform	2.03E+00	mg/kg		-	-	-	-	-	< 0.050	-	-	< 0.050	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg		-	-	-	-	-	< 0.20	-	-	< 0.10	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg		-	-	-	-	-	< 0.025	-	-	**< 0.072**	-	-	-	-	-	-
1,1-dichloroethane	5.91E+00	mg/kg		-	-	-	-	-	< 0.025	-	-	< 0.025	-	-	-	-	-	-
1,2-dichloroethane	2.11E-01	mg/kg		-	-	-	-	-	< 0.025	-	-	< 0.025	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg		-	-	-	-	-	< 0.025	-	-	< 0.025	-	-	-	-	-	-
1,3-dichloropropene (Trans)	5.84E-02	mg/kg		-	-	-	-	-	< 0.050	-	-	< 0.050	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg		-	-	-	-	-	0.18	-	-	< 0.025	-	-	-	-	-	-
1,1,2-trichloroethane	**5.05E-02**	mg/kg		-	-	-	-	-	< 0.025	-	-	< 0.025	-	-	-	-	-	-
Trichloroethylene (TCE)	3.55E-02	mg/kg		-	-	-	-	-	< 0.010	-	-	< 0.010	-	-	-	-	-	-
Benzene	**2.86E-02**	mg/kg		< 0.0050	< 0.0050	0.0086	-	-	< 0.0050	-	-	< 0.0070	-	-	-	-	-	-
Toluene	2.16E+02	mg/kg		< 0.020	< 0.020	< 0.020	-	-	< 0.025	-	-	< 0.025	-	-	-	-	-	-
Ethylbenzene	7.01E+01	mg/kg		< 0.010	< 0.010	< 0.010	-	-	< 0.010	-	-	0.042	-	-	-	-	-	-
Xylenes, Total	**9.40E+00**	mg/kg		< 0.040	< 0.040	< 0.040	-	-	< 0.10	-	-	< 0.10	-	-	-	-	-	-
Styrene	4.23E+02	mg/kg		< 0.030	< 0.030	< 0.030	-	-	< 0.10	-	-	< 0.10	-	-	-	-	-	-
1,2,4-Trichlorobenzene	1.31E+01	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	4.64E+02	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Maximum Allowable Soil Concentration	Unit															
Location			K19B-09MW-01	K19B-10BH-17	K19B-10MW-12	K19B-10MW-12	K19B-10MW-15	K19B-10MW-15	K19B-10MW-16	K19B-10MW-18	K19B-10MW-18	K19-BH17-03	K19-BH17-03	K19-BH17-08	K19-BH17-08	K19-BH17-09	K19-BH17-09
Sample Name				K19B-10BH-17-5	K19B-10MW-12-	K19-DUP-7	K19B-10MW-15-	K19-DUP-9	K19B-10MW-16-	K19B-10MW-18-	K19-DUP-10	06696-11	06696-12	06700-07	06700-10	06701-01	06701-02
Sample Date			10/24/2009	8/20/2010	8/17/2010	8/17/2010	8/19/2010	8/19/2010	8/19/2010	8/20/2010	8/20/2010	1/31/2017	1/31/2017	2/4/2017	2/4/2017	2/4/2017	2/4/2017
Sample Depth			3-3.7 m	3.05-3.66 m	2.45-2.8 m	2.45-2.8 m	3.05-3.35 m	3.05-3.35 m	3.05-3.32 m	3-3.65 m	3-3.65 m	3.5-3.5 m	4-4 m	2.5-2.5 m	5.2-5.2 m	2.5-2.5 m	2.5-2.5 m
SYS_SAMPLE_CODE			K19B-09BH-01-4	W48611	W31229	W31231	W37323	W37329	W37328	W48616	W48631	QN1622	QN1623	QN6520	QN6523	QN6526	QN6527
PARENT_SAMPLE_CODE						W31229		W37323			W48616						QN6526
SAMPLE_TYPE_CODE			N	N	N	FD	N	FD	N	N	FD	N	N	N	N	N	FD
FIELD_SDG				B076365	B073095	B073095	B074322	B074322	B074322	B076365	B076365	B709132	B709132	B710078	B710078	B710078	B710078
PAH																	
Naphthalene	**1.21E+01**	mg/kg	-	0.045	0.15	0.15	0.13	0.21	0.085	0.074	0.12	0.53	-	< 0.010	0.93	0.15	0.38
VOC																	
Bromodichloromethane (BDCM)	1.76E+00	mg/kg	-	-	< 0.050	-	-	-	-	-	-	-	0.13	< 0.050	0.10	< 0.050	< 0.050
Chlorobenzene	1.09E+00	mg/kg	-	-	< 0.025	-	-	-	-	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Chloroform	2.03E+00	mg/kg	-	-	< 0.050	-	-	-	-	-	-	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg	-	-	< 0.10	-	-	-	-	-	-	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg	-	-	< 0.025	-	-	-	-	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1-dichloroethane	5.91E+00	mg/kg	-	-	< 0.025	-	-	-	-	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-dichloroethane	2.11E-01	mg/kg	-	-	< 0.025	-	-	-	-	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg	-	-	< 0.025	-	-	-	-	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,3-dichloropropene (Trans)	5.84E-02	mg/kg	-	-	< 0.050	-	-	-	-	-	-	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg	-	-	< 0.025	-	-	-	-	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1,2-trichloroethane	**5.05E-02**	mg/kg	-	-	< 0.025	-	-	-	-	-	-	-	0.044	< 0.025	< 0.025	< 0.025	< 0.025
Trichloroethylene (TCE)	3.55E-02	mg/kg	-	-	< 0.010	-	-	-	-	-	-	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Benzene	**2.86E-02**	mg/kg	**< 0.04**	-	< 0.0050	-	-	-	-	-	-	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Toluene	2.16E+02	mg/kg	< 0.5	-	< 0.025	-	-	-	-	-	-	-	0.038	< 0.020	0.099	< 0.020	0.15
Ethylbenzene	7.01E+01	mg/kg	< 0.5	-	< 0.010	-	-	-	-	-	-	-	0.33	< 0.010	0.38	0.11	0.052
Xylenes, Total	**9.40E+00**	mg/kg	< 0.1	-	< 0.10	-	-	-	-	-	-	-	1.5	< 0.040	1.6	0.21	0.083
Styrene	4.23E+02	mg/kg	< 0.1	-	< 0.10	-	-	-	-	-	-	-	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030
1,2,4-Trichlorobenzene	1.31E+01	mg/kg	-	-	-	-	-	-	-	-	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Acetone	4.64E+02	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

Location			K19-BH17-09	K19-BH17-15	K19-BH17-15	K19-BH17-16	K19-BH17-16	K19-BH17-16	K19-HA17-01-	K19-HA17-06	K19-HA17-06	K19-HA17-07	K19-HA17-08	K19-HA17-08	K19-HD17-01	K19-HD17-02	K19-HD17-03
Sample Name			06701-04	06705-03	06705-04	06705-09	06705-10	06705-11	03811-04	03845-01	03845-03	03606-01	03606-02	03606-03	03776-01	03776-02	03776-03
Sample Date			2/4/2017	2/7/2017	2/7/2017	2/7/2017	2/7/2017	2/7/2017	7/17/2017	7/23/2017	7/23/2017	7/29/2017	7/30/2017	7/30/2017	7/16/2017	7/16/2017	7/16/2017
Sample Depth			4.3-4.3 m	3.5-3.5 m	4.3-4.3 m	3.5-3.5 m	4.2-4.2 m	4.2-4.2 m	0.4-0.6 m	0.5-0.6 m	1.4-1.5 m	0.35-0.5 m	0.3-0.45 m	0.7-1.1 m	0.4-0.4 m	0.4-0.4 m	0.35-0.35 m
SYS_SAMPLE_CODE			QN6529	QN9088	QN9089	QN9094	QN9095	QN9096	8582879-03811-	8598960-03845-	8598962-03845-	8604446-03606-	8604447-03606-	8604449-03606-	8565902-03776-	8565909-03776-	8565911-03776-
PARENT_SAMPLE_CODE								QN9095									
SAMPLE_TYPE_CODE			N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N
FIELD_SDG			B710078	B710365	B710365	B710365	B710365	B710365	17N240971	17N243343	17N243343	17N244304	17N244304	17N244304	17N238668	17N238668	17N238668
Parameter	**Maximum Allowable Soil Concentration**	**Unit**															
PAH																	
Naphthalene	**1.21E+01**	mg/kg	0.59	-	0.85	0.57	0.84	0.73	-	< 0.005	< 0.005	0.009	0.039	0.017	< 0.005	0.005	0.005
VOC																	
Bromodichloromethane (BDCM)	1.76E+00	mg/kg	-	0.081	-	0.079	-	-	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05
Chlorobenzene	1.09E+00	mg/kg	-	< 0.025	-	< 0.025	-	-	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05
Chloroform	2.03E+00	mg/kg	-	< 0.050	-	< 0.050	-	-	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg	-	< 0.10	-	< 0.10	-	-	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg	-	< 0.025	-	< 0.025	-	-	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05
1,1-dichloroethane	5.91E+00	mg/kg	-	< 0.025	-	< 0.025	-	-	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05
1,2-dichloroethane	2.11E-01	mg/kg	-	< 0.025	-	< 0.025	-	-	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg	-	< 0.025	-	< 0.025	-	-	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05
1,3-dichloropropene (Trans)	5.84E-02	mg/kg	-	< 0.050	-	< 0.050	-	-	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg	-	< 0.025	-	< 0.025	-	-	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05
1,1,2-trichloroethane	**5.05E-02**	mg/kg	-	< 0.025	-	< 0.025	-	-	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05
Trichloroethylene (TCE)	3.55E-02	mg/kg	-	< 0.0050	-	< 0.0050	-	-	-	-	< 0.01	< 0.01	< 0.01	-	-	< 0.01	< 0.01
Benzene	**2.86E-02**	mg/kg	-	0.0055	-	< 0.0050	-	-	< 0.02	-	< 0.02	< 0.02	< 0.02	-	-	< 0.02	< 0.02
Toluene	2.16E+02	mg/kg	-	0.031	-	0.034	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05
Ethylbenzene	7.01E+01	mg/kg	-	0.12	-	0.077	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05
Xylenes, Total	**9.40E+00**	mg/kg	-	0.59	-	0.36	-	-	< 0.1	-	< 0.2	< 0.2	< 0.2	-	-	< 0.2	< 0.2
Styrene	4.23E+02	mg/kg	-	< 0.030	-	< 0.030	-	-	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05
1,2,4-Trichlorobenzene	1.31E+01	mg/kg	-	< 0.025	-	< 0.025	-	-	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05
Acetone	4.64E+02	mg/kg	-	-	-	-	-	-	-	-	< 0.5	< 0.5	< 0.5	-	-	< 0.5	< 0.5

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

	Location	K19-HD17-04	K19-HD17-07	K19-MW16-01S	K19-MW16-03	K19-MW16-03	K19-MW16-05	K19-MW16-07	K19-MW16-10	K19-MW16-11	K19-MW16-12	K19-MW16-13	K19-MW17-01	K19-MW17-01	K19-MW17-01	K19-MW17-01
	Sample Name	03776-04	03776-07	K19-MW16-3/7/2016	K19-MW16-3/8/2016	K19-MW16-3/8/2016	K19-MW16-3/9/2016	K19-MW16-3/10/2016	K19-MW16-3/12/2016	K19-MW16-3/13/2016	K19-MW16-3/13/2016	K19-MW16-3/14/2016	03360-02	03360-04	03360-05	03360-08
	Sample Date	7/16/2017	7/16/2017	2-2 m	0.9-1 m	2-2 m	3-3 m	0.76-1.1 m	0.9-1 m	0.9-1 m	0.76-1 m	1-2 m	1.5-1.5 m	3.5-3.5 m	3.5-3.5 m	6.5-6.5 m
	SYS_SAMPLE_CODE	8565912-03776-	8565915-03776-	OG9364	OG9369	OG9370	OG9409	OG9413	OH3628	OH3630	OH3632	OH7509	QN1514	QN1516	QN1517	QN1520
	PARENT_SAMPLE_CODE														QN1516	
	SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N
	FIELD_SDG	17N238668	17N238668	B619198	B619198	B619198	B619203	B619203	B619935	B619935	B619935	B620735	B709132	B709132	B709132	B709132
Parameter	**Maximum Allowable Soil Concentration**	**Unit**														
PAH																
Naphthalene	**1.21E+01**	mg/kg	< 0.01	-	< 0.010	0.014	0.014	< 0.050	< 0.050	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	1.3	1.3	0.33
VOC																	
Bromodichloromethane (BDCM)	1.76E+00	mg/kg	-	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	0.095	0.66	0.60	0.056
Chlorobenzene	1.09E+00	mg/kg	-	-	< 0.025	< 0.025	< 0.025	< 0.042	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.066	0.063	< 0.025
Chloroform	2.03E+00	mg/kg	-	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Dichloromethane (DCM) (Methylene Chloride	1.02E+01	mg/kg	-	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.66	0.85	< 0.10
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1-dichloroethane	5.91E+00	mg/kg	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-dichloroethane	2.11E-01	mg/kg	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.078	0.094	0.13	< 0.025
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,3-dichloropropene (Trans)	5.84E-02	mg/kg	-	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1,2-trichloroethane	**5.05E-02**	mg/kg	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	**0.070**	**0.45**	**0.38**	< 0.025
Trichloroethylene (TCE)	3.55E-02	mg/kg	-	-	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Benzene	**2.86E-02**	mg/kg	-	< 0.02	< 0.0050	< 0.0074	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	**0.85**	**1.9**	**2.7**	**0.075**
Toluene	2.16E+02	mg/kg	-	< 0.05	< 0.020	0.027	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.054	0.35	0.64	0.025
Ethylbenzene	7.01E+01	mg/kg	-	< 0.05	0.011	0.012	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.011	4.3	5.1	0.041
Xylenes, Total	**9.40E+00**	mg/kg	-	< 0.1	< 0.040	0.042	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	0.054	5.0	6.2	0.057
Styrene	4.23E+02	mg/kg	-	< 0.05	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030
1,2,4-Trichlorobenzene	1.31E+01	mg/kg	-	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Acetone	4.64E+02	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Maximum Allowable Soil Concentration	Unit															
Location			K19-MW17-01	K19-MW17-05	K19-MW17-05	K19-MW17-05	K19-MW17-05	K19-MW17-06	K19-MW17-06	K19-MW17-06	K19-MW17-06	K19-MW17-07	K19-MW17-07	K19-MW17-07	K19-MW17-10	K19-MW17-10	K19-MW17-11
Sample Name			03360-10	06697-11	06697-12	06698-01	06698-02	06698-09	06698-10	06698-11	06698-12	06699-08	06699-10	06699-12	06701-08	06701-10	06702-05
Sample Date			1/30/2017	2/1/2017	2/1/2017	2/1/2017	2/1/2017	2/2/2017	2/2/2017	2/2/2017	2/2/2017	2/3/2017	2/3/2017	2/3/2017	2/4/2017	2/4/2017	2/5/2017
Sample Depth			8.6-8.6 m	1.4-1.4 m	2.5-2.5 m	3.5-3.5 m	4.7-4.7 m	2.5-2.5 m	3.5-3.5 m	3.5-3.5 m	4.7-4.7 m	1.5-1.5 m	3.5-3.5 m	4.7-4.7 m	2.5-2.5 m	4.7-4.7 m	3.5-3.5 m
SYS_SAMPLE_CODE			QN1522	QN1634	QN1635	QN6490	QN6491	QN6498	QN6499	QN6500	QN6501	QN6509	QN6511	QN6513	QN6533	QN6535	QN6542
PARENT_SAMPLE_CODE										QN6499							
SAMPLE_TYPE_CODE			N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N
FIELD_SDG			B709132	B709132	B709132	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078
PAH																	
Naphthalene	**1.21E+01**	mg/kg	0.49	< 0.010	0.071	-	0.85	0.020	0.52	0.39	0.51	< 0.010	0.52	0.91	0.046	0.74	0.017
VOC																	
Bromodichloromethane (BDCM)	1.76E+00	mg/kg	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	0.058	< 0.050	-	< 0.050	< 0.050	0.087	< 0.050	-	< 0.050
Chlorobenzene	1.09E+00	mg/kg	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025
Chloroform	2.03E+00	mg/kg	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050
Dichloromethane (DCM) (Methylene Chloride	1.02E+01	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025
1,1-dichloroethane	5.91E+00	mg/kg	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025
1,2-dichloroethane	2.11E-01	mg/kg	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025
1,3-dichloropropene (Trans)	5.84E-02	mg/kg	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025
1,1,2-trichloroethane	**5.05E-02**	mg/kg	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	0.031	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025
Trichloroethylene (TCE)	3.55E-02	mg/kg	< 0.0050	< 0.0050	< 0.0050	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050	-	< 0.0050
Benzene	**2.86E-02**	mg/kg	0.015	< 0.0050	< 0.0050	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050	-	< 0.0050	0.012	< 0.0050	< 0.0050	-	< 0.0050
Toluene	2.16E+02	mg/kg	0.71	< 0.020	0.39	0.19	-	< 0.020	0.30	0.13	-	< 0.020	0.023	0.18	< 0.020	-	0.060
Ethylbenzene	7.01E+01	mg/kg	0.014	< 0.010	0.015	0.11	-	< 0.010	0.018	0.013	-	< 0.010	0.29	0.25	< 0.010	-	< 0.010
Xylenes, Total	**9.40E+00**	mg/kg	< 0.040	< 0.040	< 0.040	0.50	-	< 0.040	0.10	0.044	-	< 0.040	0.087	1.1	< 0.040	-	< 0.040
Styrene	4.23E+02	mg/kg	< 0.030	< 0.030	< 0.030	< 0.030	-	< 0.030	< 0.030	< 0.030	-	< 0.030	< 0.030	< 0.030	< 0.030	-	< 0.030
1,2,4-Trichlorobenzene	1.31E+01	mg/kg	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025
Acetone	4.64E+02	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Maximum Allowable Soil Concentration	Unit															
Location			K19-MW17-11	K19-MW17-12	K19-MW17-12	K19-MW17-13	K19-MW17-13	K19-MW17-14	K19-MW17-14	K19-MW17-14	K19-MW17-14	K19-MW17-17-	K19-MW17-17-	K19-MW17-17-	K19-MW17-18-	K19-MW17-18-	K19-MW17-18-
Sample Name			06702-07	06702-10	06703-01	06703-10	06703-12	06704-06	06704-07	06704-08	06704-09	03831-04	03831-05	03831-06	03831-09	03831-10	03831-12
Sample Date			2/5/2017	2/5/2017	2/5/2017	2/6/2017	2/6/2017	2/7/2017	2/7/2017	2/7/2017	2/7/2017	7/18/2017	7/18/2017	7/18/2017	7/19/2017	7/19/2017	7/19/2017
Sample Depth			5.5-5.5 m	1.4-1.4 m	3.5-3.5 m	3.5-3.5 m	5.5-5.5 m	2.5-2.5 m	2.5-2.5 m	3.5-3.5 m	4.3-4.3 m	4.3-4.5 m	5.2-5.8 m	6.5-7 m	1.5-1.8 m	4.5-4.8 m	5.2-5.5 m
SYS_SAMPLE_CODE			QN6544	QN6547	QN6550	QN6559	QN6561	QN9105	QN9106	QN9107	QN9108	8582992-03831-	8582993-03831-	8582994-03831-	8582998-03831-	8582999-03831-	8583001-03831-
PARENT_SAMPLE_CODE									QN9105								
SAMPLE_TYPE_CODE			N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N
FIELD_SDG			B710078	B710078	B710078	B710078	B710078	B710365	B710365	B710365	B710365	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971
PAH																	
Naphthalene	**1.21E+01**	mg/kg	1.0	< 0.010	0.69	0.51	1.0	< 0.010	0.011	-	0.014	0.010	< 0.005	0.029	0.124	1.09	1.25
VOC																	
Bromodichloromethane (BDCM)	1.76E+00	mg/kg	-	< 0.050	0.10	0.084	0.088	< 0.050	< 0.050	< 0.050	-	-	< 0.05	-	-	< 0.05	-
Chlorobenzene	1.09E+00	mg/kg	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.05	-	-	< 0.05	-
Chloroform	2.03E+00	mg/kg	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	-	< 0.05	-	-	< 0.05	-
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg	-	< 0.10	< 0.10	< 0.10	< 0.10	0.11	< 0.10	0.18	-	-	< 0.05	-	-	< 0.05	-
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.05	-	-	< 0.05	-
1,1-dichloroethane	5.91E+00	mg/kg	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.05	-	-	< 0.05	-
1,2-dichloroethane	2.11E-01	mg/kg	-	< 0.025	< 0.025	< 0.025	< 0.025	0.045	0.048	< 0.025	-	-	< 0.05	-	-	< 0.05	-
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.05	-	-	< 0.05	-
1,3-dichloropropene (Trans)	5.84E-02	mg/kg	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	-	< 0.05	-	-	< 0.05	-
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.05	-	-	< 0.05	-
1,1,2-trichloroethane	**5.05E-02**	mg/kg	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.05	-	-	< 0.05	-
Trichloroethylene (TCE)	3.55E-02	mg/kg	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	-	-	< 0.01	-	-	< 0.01	-
Benzene	**2.86E-02**	mg/kg	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050	**0.069**	**0.060**	**0.25**	-	-	< 0.02	-	-	< 0.02	-
Toluene	2.16E+02	mg/kg	-	< 0.020	0.027	0.021	0.098	0.16	< 0.020	0.26	-	-	< 0.05	-	-	< 0.05	-
Ethylbenzene	7.01E+01	mg/kg	-	< 0.010	0.093	0.055	0.30	< 0.010	< 0.010	0.020	-	-	< 0.05	-	-	0.10	-
Xylenes, Total	**9.40E+00**	mg/kg	-	< 0.040	0.44	0.27	1.3	< 0.040	< 0.040	0.045	-	-	< 0.2	-	-	0.5	-
Styrene	4.23E+02	mg/kg	-	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	-	-	< 0.05	-	-	< 0.05	-
1,2,4-Trichlorobenzene	1.31E+01	mg/kg	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	-	< 0.05	-	-	< 0.05	-
Acetone	4.64E+02	mg/kg	-	-	-	-	-	-	-	-	-	-	< 0.5	-	-	< 0.5	-

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Maximum Allowable Soil Concentration	Unit	Location	K19-MW17-18-	K19-MW17-18-	K19-MW17-19-	K19-MW17-19-	K19-MW17-19-	K19-MW17-20-	K19-MW17-20-	K19-MW17-20-	K19-MW17-21-	K19-MW17-21-	K19-MW17-22-	K19-MW17-22-	K19-MW17-22-	K19-MW17-22-	K19-MW17-22-
			Sample Name	03832-02	03832-04	03832-06	03832-08	03832-11	03833-03	03833-05	03833-06	03833-10	03834-02	03834-05	03834-06	03834-07	03834-09	03834-10
			Sample Date	7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/20/2017	7/20/2017	7/20/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017
			Sample Depth	7.5-8.5 m	12-13 m	1.8-2.1 m	5-6 m	7-8 m	3-3.5 m	5.8-6.8 m	5.8-6.8 m	4.5-5 m	9-10 m	3-3.5 m	4.5-5 m	4.5-5 m	8-8.5 m	9-10 m
			SYS_SAMPLE_CODE	8583004-03832-	8583006-03832-	8583009-03832-	8583011-03832-	8583016-03832-	8590368-03833-	8590370-03833-	8590372-03833-	8590381-03833-	8590417-03834-	8590421-03834-	8590423-03834-	8590427-03834-	8590432-03834-	8590434-03834-
			PARENT_SAMPLE_CODE								8590370-03833-					8590423-03834-		
			SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	FD	N	N	N	N	FD	N	N
			FIELD_SDG	17N240971	17N240971	17N240971	17N240971	17N240971	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036
PAH																		
Naphthalene	**1.21E+01**	mg/kg		0.028	0.062	0.047	0.169	1.34	0.049	1.54	0.94	0.99	1.28	0.71	1.28	1.08	2.20	0.66
VOC																		
Bromodichloromethane (BDCM)	1.76E+00	mg/kg		< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-	< 0.05
Chlorobenzene	1.09E+00	mg/kg		< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-	< 0.05
Chloroform	2.03E+00	mg/kg		< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-	< 0.05
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg		< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-	< 0.05
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg		< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-	< 0.05
1,1-dichloroethane	5.91E+00	mg/kg		< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-	< 0.05
1,2-dichloroethane	2.11E-01	mg/kg		< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-	< 0.05
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg		< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-	< 0.05
1,3-dichloropropene (Trans)	5.84E-02	mg/kg		< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-	< 0.05
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg		< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-	< 0.05
1,1,2-trichloroethane	**5.05E-02**	mg/kg		< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-	< 0.05
Trichloroethylene (TCE)	3.55E-02	mg/kg		< 0.01	-	-	< 0.01	-	-	< 0.01	-	< 0.01	-	-	< 0.01	-	-	< 0.01
Benzene	**2.86E-02**	mg/kg		< 0.02	< 0.02	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	-	< 0.02	-	-	< 0.02
Toluene	2.16E+02	mg/kg		< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	0.11	0.09	0.06	0.13	-	0.20	-	-	0.08
Ethylbenzene	7.01E+01	mg/kg		< 0.05	< 0.05	-	< 0.05	0.30	< 0.05	0.22	0.23	0.23	0.44	-	0.38	-	-	0.29
Xylenes, Total	**9.40E+00**	mg/kg		< 0.2	< 0.1	-	< 0.2	2.2	< 0.1|< 0.1	1.0	1.0|1.0	1.0	1.9|1.9	-	1.6	-	-	1.3
Styrene	4.23E+02	mg/kg		< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05
1,2,4-Trichlorobenzene	1.31E+01	mg/kg		< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-	< 0.05
Acetone	4.64E+02	mg/kg		< 0.5	-	-	< 0.5	-	-	< 0.5	-	< 0.5	-	-	< 0.5	-	-	< 0.5

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Maximum Allowable Soil Concentration	Unit	Location	K19-MW17-23-	K19-MW17-23-	K19-MW17-23-	K19-MW17-24-	K19-MW17-24-	K19-MW17-25-	K19-MW17-25-	K19-MW17-25-	K19-MW17-26-	K19-MW17-26-	K19-MW17-26-	K19-MW17-26-	K19-MW17-26-	K19-MW17-27-	K19-MW17-27-
			Sample Name	03835-01	03835-02	03835-04	03835-10	03835-12	03836-03	03836-04	03836-05	03836-08	03836-09	03836-10	03836-12	03837-01	03837-05	03837-06
			Sample Date	7/21/2017	7/21/2017	7/21/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/23/2017	7/23/2017
			Sample Depth	3-3.3 m	4.5-5 m	8-8.5 m	3-3.5 m	4.7-5.2 m	3-3.5 m	4.5-5 m	6-6.5 m	3.5-4 m	3.5-4 m	5-5.5 m	8-8.8 m	11-11.8 m	4.5-5 m	6-6.5 m
			SYS_SAMPLE_CODE	8590466-03835-	8590469-03835-	8590477-03835-	8590483-03835-	8590485-03835-	8598922-03836-	8598923-03836-	8598924-03836-	8598927-03836-	8598928-03836- 8598927-03836-	8598929-03836-	8598931-03836-	8598932-03837-	8598936-03837-	8598937-03837-
			PARENT_SAMPLE_CODE															
			SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N
			FIELD_SDG	17N242036	17N242036	17N242036	17N242036	17N242036	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343
PAH																		
Naphthalene	**1.21E+01**	mg/kg		0.75	1.46	0.92	0.46	0.841	-	0.19	-	0.59	0.52	0.71	1.00	1.39	0.98	-
VOC																		
Bromodichloromethane (BDCM)	1.76E+00	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05
Chlorobenzene	1.09E+00	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05
Chloroform	2.03E+00	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05
1,1-dichloroethane	5.91E+00	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05
1,2-dichloroethane	2.11E-01	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05
1,3-dichloropropene (Trans)	5.84E-02	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05
1,1,2-trichloroethane	**5.05E-02**	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05
Trichloroethylene (TCE)	3.55E-02	mg/kg		< 0.01	-	-	-	< 0.01	-	-	< 0.01	< 0.01	-	-	-	-	-	< 0.01
Benzene	**2.86E-02**	mg/kg		< 0.02	-	< 0.02	-	< 0.02	< 0.02	-	< 0.02	< 0.02	< 0.02	-	< 0.02	< 0.02	-	< 0.02
Toluene	2.16E+02	mg/kg		< 0.05	-	0.22	-	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	1.35	0.74	-	< 0.05
Ethylbenzene	7.01E+01	mg/kg		0.14	-	0.27	-	0.17	< 0.05	-	< 0.05	< 0.05	< 0.05	-	0.81	0.87	-	0.13
Xylenes, Total	**9.40E+00**	mg/kg		0.6	-	1.1|1.1	-	0.8	< 0.1|< 0.1	-	< 0.2	< 0.2	0.2|0.2	-	3.2|3.2	3.7|3.7	-	0.5
Styrene	4.23E+02	mg/kg		< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	-	< 0.05
1,2,4-Trichlorobenzene	1.31E+01	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	< 0.05	-	-	-	-	-	< 0.05
Acetone	4.64E+02	mg/kg		< 0.5	-	-	-	< 0.5	-	-	< 0.5	< 0.5	-	-	-	-	-	< 0.5

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Maximum Allowable Soil Concentration	Unit	Location	K19-MW17-27-	K19-MW17-28-	K19-MW17-28-	K19-MW17-29-	K19-MW17-29-	K19-MW17-29-	K19-MW17-29-	K19-MW17-30-	K19-MW17-30-	K19-MW17-31-	K19-MW17-31-	K19-MW17-31-	K19-MW17-31-	K19-MW17-32-	K19-MW17-32-
			Sample Name	03837-08	03838-01	03838-03	03838-06	03838-07	03838-08	03838-10	03839-01	03839-04	03839-05	03839-07	03839-09	03839-10	03839-11	03846-01
			Sample Date	7/23/2017	7/23/2017	7/23/2017	7/24/2017	7/24/2017	7/24/2017	7/24/2017	7/25/2017	7/25/2017	7/26/2017	7/26/2017	7/26/2017	7/26/2017	7/26/2017	7/26/2017
			Sample Depth	8-8.75 m	5-5.5 m	8-8.5 m	2.5-2.8 m	3.4-3.7 m	3.4-3.7 m	5.3-5.5 m	3.5-3.9 m	8-8.7 m	0.3-0.5 m	3.5-4 m	6.4-6.8 m	6.4-6.8 m	0.3-0.5 m	3.5-4 m
			SYS_SAMPLE_CODE	8598939-03837-	8598944-03838-	8598946-03838-	8598949-03838-	8598950-03838-	8598951-03838-	8598953-03838-	8601360-03839-	8601377-03839-	8601386-03839-	8601394-03839-	8601397-03839-	8601399-03839-	8601404-03839-	8601416-03846-
			PARENT_SAMPLE_CODE						8598950-03838-							8601397-03839-		
			SAMPLE_TYPE_CODE	N	N	N	N	N	FD	N	N	N	N	N	N	FD	N	N
			FIELD_SDG	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826
PAH																		
Naphthalene	**1.21E+01**	mg/kg		1.32	0.014	0.044	0.306	0.746	0.96	0.256	0.304	1.77	0.008	0.228	1.22	1.53	0.011	0.029
VOC																		
Bromodichloromethane (BDCM)	1.76E+00	mg/kg		< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	-	-	-	< 0.05
Chlorobenzene	1.09E+00	mg/kg		< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	-	-	-	< 0.05
Chloroform	2.03E+00	mg/kg		< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	-	-	-	< 0.05
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg		< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	-	-	-	< 0.05
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg		< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	-	-	-	< 0.05
1,1-dichloroethane	5.91E+00	mg/kg		< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	-	-	-	< 0.05
1,2-dichloroethane	2.11E-01	mg/kg		< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	-	-	-	< 0.05
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg		< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	-	-	-	< 0.05
1,3-dichloropropene (Trans)	5.84E-02	mg/kg		< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	-	-	-	< 0.05
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg		< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	-	-	-	< 0.05
1,1,2-trichloroethane	**5.05E-02**	mg/kg		< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	-	-	-	< 0.05
Trichloroethylene (TCE)	3.55E-02	mg/kg		< 0.01	-	< 0.01	-	< 0.01	< 0.01	-	< 0.01	-	-	< 0.01	-	-	-	< 0.01
Benzene	**2.86E-02**	mg/kg		< 0.02	< 0.02	< 0.02	**0.04**	**0.05**	**0.08**	< 0.02	< 0.02	< 0.02	-	< 0.02	< 0.02	< 0.02	-	< 0.02
Toluene	2.16E+02	mg/kg		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.34	-	< 0.05	0.05	< 0.05	-	< 0.05
Ethylbenzene	7.01E+01	mg/kg		0.25	< 0.05	< 0.05	< 0.05	0.08	0.14	< 0.05	< 0.05	0.44	-	< 0.05	0.24	0.11	-	< 0.05
Xylenes, Total	**9.40E+00**	mg/kg		1.1	< 0.1|< 0.1	< 0.2	< 0.1	< 0.2	0.3	< 0.1|< 0.1	< 0.2	1.8	-	< 0.2	1.1	0.5	-	< 0.2
Styrene	4.23E+02	mg/kg		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05
1,2,4-Trichlorobenzene	1.31E+01	mg/kg		< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	-	-	-	< 0.05
Acetone	4.64E+02	mg/kg		< 0.5	-	< 0.5	-	< 0.5	< 0.5	-	< 0.5	-	-	< 0.5	-	-	-	< 0.5

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Maximum Allowable Soil Concentration	Unit	Location	Sample Name	Sample Date	Sample Depth	SYS_SAMPLE_CODE	PARENT_SAMPLE_CODE	SAMPLE_TYPE_CODE	FIELD_SDG
			K19-MW17-32-	03846-02	7/26/2017	5-5.5 m	8601417-03846-		N	17N243826
			K19-MW17-33-	03846-06	7/26/2017	5-5.5 m	8601422-03846-		N	17N243826
			K19-MW17-34-	03846-09	7/27/2017	3.5-4 m	8601425-03846-		N	17N243826
			K19-MW17-34-	03846-10	7/27/2017	3.5-4 m	8601427-03846-	8601425-03846-	FD	17N243826
			K19-MW17-34-	03846-12	7/27/2017	6-6.5 m	8601431-03846-		N	17N243826
			K19-MW17-35-	03847-02	7/27/2017	1-1.5 m	8601469-03847-		N	17N243826
			K19-MW17-35-	03847-03	7/27/2017	1-1.5 m	8601470-03847-	8601469-03847-	FD	17N243826
			K19-MW17-35-	03847-05	7/27/2017	2.5-3 m	8601472-03847-		N	17N243826
			K19-MW17-35-	03847-07	7/27/2017	4-4.5 m	8601474-03847-		N	17N243826
			K19-MW17-35-	03847-08	7/27/2017	4-4.5 m	8601475-03847-	8601474-03847-	FD	17N243826
			K19-MW17-35-	03847-10	7/27/2017	6.5-7 m	8601477-03847-		N	17N243826
			K19-SS16-01	01481-09	8/31/2016	0.27-0.27 m	PK6760		N	B675549
			K19-SS16-02	01481-10	8/31/2016	0.34-0.34 m	PK6761		N	B675549
			K19-SS16-03	01481-11	8/31/2016	0.4-0.4 m	PK6762		N	B675549
			K19-SS16-04	01481-12	8/31/2016	0.32-0.32 m	PK6763		N	B675549
PAH										
Naphthalene	**1.21E+01**	mg/kg	0.428	0.123	0.121	0.151	0.94	1.17	1.01	0.022	0.387	0.471	0.016	< 0.010	< 0.010	< 0.010	< 0.010
VOC																	
Bromodichloromethane (BDCM)	1.76E+00	mg/kg	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	-	< 0.050	< 0.050	-	< 0.050
Chlorobenzene	1.09E+00	mg/kg	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	-	< 0.025	< 0.025	-	< 0.025
Chloroform	2.03E+00	mg/kg	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	-	< 0.050	< 0.050	-	< 0.050
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	-	< 0.10	< 0.10	-	< 0.10
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	-	< 0.025	< 0.025	-	< 0.025
1,1-dichloroethane	5.91E+00	mg/kg	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	-	< 0.025	< 0.025	-	< 0.025
1,2-dichloroethane	2.11E-01	mg/kg	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	-	< 0.025	< 0.025	-	< 0.025
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	-	< 0.025	< 0.025	-	< 0.025
1,3-dichloropropene (Trans)	5.84E-02	mg/kg	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	-	< 0.050	< 0.050	-	< 0.050
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	-	< 0.025	< 0.025	-	< 0.025
1,1,2-trichloroethane	**5.05E-02**	mg/kg	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	-	< 0.025	< 0.025	-	< 0.025
Trichloroethylene (TCE)	3.55E-02	mg/kg	-	< 0.01	< 0.01	-	-	< 0.01	-	-	< 0.01	< 0.01	-	< 0.0050	< 0.0050	-	< 0.0050
Benzene	**2.86E-02**	mg/kg	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	**0.30**	**0.39**	**0.08**	< 0.0050	< 0.0050	-	< 0.0050
Toluene	2.16E+02	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.06	0.08	< 0.05	< 0.020	< 0.020	-	< 0.020
Ethylbenzene	7.01E+01	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	0.07	0.12	0.11	< 0.05	1.13	1.63	< 0.05	< 0.010	< 0.010	-	< 0.010
Xylenes, Total	**9.40E+00**	mg/kg	< 0.1	< 0.2	< 0.2	< 0.1	0.3	0.3	0.3	< 0.1	0.3	0.3	< 0.1	< 0.040	< 0.040	-	< 0.040
Styrene	4.23E+02	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.030	< 0.030	-	< 0.030
1,2,4-Trichlorobenzene	1.31E+01	mg/kg	-	< 0.05	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	-	< 0.025	< 0.025	-	< 0.025
Acetone	4.64E+02	mg/kg	-	< 0.5	< 0.5	-	-	< 0.5	-	-	< 0.5	< 0.5	-	-	-	-	-

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Maximum Allowable Soil Concentration	Unit															
Location			K19-TP16-02	K19-TP16-03	K19-TP16-04	K19-TP16-05	K19-TP16-06	K19-TP16-10	K19-TP16-11	K19-TP16-11	K19-TP16-13	K19-TP16-13	K19-TP16-21	K19-TP16-25	K19-TP16-25	K19-TP16-27	K19-TP16-27
Sample Name			K19-TP16-3/7/2016	K19-TP16-3/7/2016	K19-TP16-3/8/2016	K19-TP16-3/8/2016	K19-TP16-3/8/2016	K19-TP16-3/10/2016	K19-TP16-3/10/2016	K19-TP16-3/10/2016	01463-08 8/29/2016	01463-09 8/29/2016	01480-07 8/30/2016	01482-08 8/31/2016	01482-10 8/31/2016	01483-03 8/31/2016	01483-04 8/31/2016
Sample Depth			1.5-1.5 m	2.9-2.9 m	2.2-2.2 m	1.9-1.9 m	2.4-2.4 m	1.9-1.9 m	2-2 m	2-2 m	2.2-2.2 m	3.1-3.1 m	2-2 m	1.6-1.6 m	3.6-3.6 m	0.4-0.4 m	1.5-1.5 m
SYS_SAMPLE_CODE			OG9396	OG9398	OG9400	OG9401	OG9376	OG9424	OG9426	OG9427	PK1318	PK1319	PK5709	PK6788	PK6790	PK6795	PK6796
PARENT_SAMPLE_CODE										OG9426							
SAMPLE_TYPE_CODE			N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N
FIELD_SDG			B619198	B619198	B619198	B619198	B619198	B619206	B619206	B619206	B674520	B674520	B675312	B675549	B675549	B675549	B675549
PAH																	
Naphthalene	**1.21E+01**	mg/kg	< 0.010	< 0.010	< 0.010	< 0.010	0.013	< 0.050	< 0.050	< 0.050	0.029	-	< 0.010	< 0.010	0.19	< 0.010	< 0.010
VOC																	
Bromodichloromethane (BDCM)	1.76E+00	mg/kg	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	-	-	-	-	-	-
Chlorobenzene	1.09E+00	mg/kg	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	-	-	-	-	-	-
Chloroform	2.03E+00	mg/kg	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	-	-	-	-	-	-
1,1-dichloroethane	5.91E+00	mg/kg	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	-	-	-	-	-	-
1,2-dichloroethane	2.11E-01	mg/kg	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	5.84E-02	mg/kg	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	-	-	-	-	-	-
1,1,2-trichloroethane	**5.05E-02**	mg/kg	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	-	-	-	-	-	-
Trichloroethylene (TCE)	3.55E-02	mg/kg	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	-	-	-	-	-	-	-
Benzene	**2.86E-02**	mg/kg	< 0.0050	< 0.0050	< 0.0099	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.015	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050
Toluene	2.16E+02	mg/kg	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	-	0.064	< 0.020	< 0.020
Ethylbenzene	7.01E+01	mg/kg	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.010	0.095	< 0.010	-	0.011	< 0.010	< 0.010
Xylenes, Total	**9.40E+00**	mg/kg	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	-	< 0.040	< 0.040	< 0.040
Styrene	4.23E+02	mg/kg	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	-	< 0.030	< 0.030	< 0.030
1,2,4-Trichlorobenzene	1.31E+01	mg/kg	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	-	-	-	-	-	-
Acetone	4.64E+02	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

	Location	K19-TP16-27	K19-TP16-31	K19-TP16-31	K19-TP16-36	K19-TP16-36	K19-TP16-37	K19-TP16-41	K19-TP16-41	K19-TP16-43	K19-TP16-43	K19-TP16-47	K19-TP16-47	K19-TP16-47	K19-TP16-48	K19-TP16-49
	Sample Name	01483-06	01485-08	01485-11	01488-01	01488-04	01488-07	01489-12	01490-04	01490-12	01491-02	01492-02	01492-03	01492-05	01492-09	01492-11
	Sample Date	8/31/2016	9/1/2016	9/1/2016	9/2/2016	9/2/2016	9/2/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016
	Sample Depth	3.5-3.5 m	0.9-0.9 m	2.8-2.8 m	1-1 m	2.9-2.9 m	2.5-2.5 m	0.7-0.7 m	4-4 m	1.7-1.7 m	3-3 m	1.7-1.7 m	2.5-2.5 m	2.5-2.5 m	2.5-2.5 m	2-2 m
	SYS_SAMPLE_CODE	PK6798	PK9459	PK9462	PL2461	PL2464	PL2467	PL2484	PL2488	PL2496	PL2499	PL2511	PL2512	PL2514	PL2518	PL2520
	PARENT_SAMPLE_CODE													PL2512		
	SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	N
	FIELD_SDG	B675549	B675954	B675954	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470
Parameter	**Maximum Allowable Soil Concentration**	**Unit**															
PAH																	
Naphthalene	**1.21E+01**	mg/kg	0.027	< 0.010	0.027	< 0.010	< 0.010	0.016	< 0.010	0.086	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
VOC																	
Bromodichloromethane (BDCM)	1.76E+00	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	1.09E+00	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	2.03E+00	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	5.91E+00	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	2.11E-01	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	5.84E-02	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	**5.05E-02**	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	3.55E-02	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	**2.86E-02**	mg/kg	< 0.0050	0.027	0.015	< 0.0050	< 0.0050	< 0.0050	-	-	-	< 0.0050	< 0.0050	-	-	< 0.0050	-
Toluene	2.16E+02	mg/kg	< 0.020	0.055	0.030	< 0.020	< 0.020	0.022	-	-	-	< 0.020	< 0.020	-	-	< 0.020	-
Ethylbenzene	7.01E+01	mg/kg	< 0.010	< 0.010	0.026	< 0.010	< 0.010	< 0.010	-	-	-	< 0.010	< 0.010	-	-	< 0.010	-
Xylenes, Total	**9.40E+00**	mg/kg	< 0.040	< 0.040	0.060	< 0.040	< 0.040	< 0.040	-	-	-	< 0.040	< 0.040	-	-	< 0.040	-
Styrene	4.23E+02	mg/kg	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	-	-	-	< 0.030	< 0.030	-	-	< 0.030	-
1,2,4-Trichlorobenzene	1.31E+01	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	4.64E+02	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Maximum Allowable Soil Concentration	Unit															
Location			K19-TP16-49	K19-TP16-49	K19-TP17-01	K19-TP17-01	K19-TP17-02	K19-TP17-02	K19-TP17-02	K19-TP17-03	K19-TP17-03	K19-TP17-03	K19-TP17-04	K19-TP17-05	K19-TP17-06	K19-TP17-07	K19-TP17-08
Sample Name			01492-12	01493-01	03343-03	03343-05	03343-07	03343-08	03343-10	03344-01	03344-02	03344-04	03344-06	03345-01	03345-10	03346-02	03346-05
Sample Date			9/3/2016	9/3/2016	1/22/2017	1/22/2017	1/22/2017	1/22/2017	1/22/2017	1/22/2017	1/22/2017	1/22/2017	1/23/2017	1/23/2017	1/24/2017	1/24/2017	1/24/2017
Sample Depth			1.7-1.7 m	3-3 m	2.4-2.4 m	4.2-4.2 m	1.8-1.8 m	1.8-1.8 m	2.5-2.5 m	1.8-1.8 m	2.5-2.5 m	3.8-3.8 m	2.5-2.5 m	2.6-2.6 m	4.2-4.2 m	3.4-3.4 m	2.5-2.5 m
SYS_SAMPLE_CODE			PL2521	PL2522	QL7792	QL7794	QL7796	QL7797	QL7799	QL7802	QL7803	QL7805	QL7807	QL7814	QL7823	QL7828	QL7831
PARENT_SAMPLE_CODE								QL7796									
SAMPLE_TYPE_CODE			N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N
FIELD_SDG			B676470	B676470	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358
PAH																	
Naphthalene	**1.21E+01**	mg/kg	-	< 0.010	0.011	0.015	< 0.010	< 0.010	0.020	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.31	0.037	0.012
VOC																	
Bromodichloromethane (BDCM)	1.76E+00	mg/kg	-	-	-	-	-	-	< 0.050	-	-	-	-	-	< 0.050	-	< 0.050
Chlorobenzene	1.09E+00	mg/kg	-	-	-	-	-	-	< 0.025	-	-	-	-	-	< 0.025	-	< 0.025
Chloroform	2.03E+00	mg/kg	-	-	-	-	-	-	< 0.050	-	-	-	-	-	< 0.050	-	< 0.050
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg	-	-	-	-	-	-	< 0.10	-	-	-	-	-	< 0.10	-	< 0.10
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg	-	-	-	-	-	-	< 0.025	-	-	-	-	-	< 0.025	-	< 0.025
1,1-dichloroethane	5.91E+00	mg/kg	-	-	-	-	-	-	< 0.025	-	-	-	-	-	< 0.025	-	< 0.025
1,2-dichloroethane	2.11E-01	mg/kg	-	-	-	-	-	-	< 0.025	-	-	-	-	-	< 0.025	-	< 0.025
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg	-	-	-	-	-	-	< 0.025	-	-	-	-	-	< 0.025	-	< 0.025
1,3-dichloropropene (Trans)	5.84E-02	mg/kg	-	-	-	-	-	-	< 0.050	-	-	-	-	-	< 0.050	-	< 0.050
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg	-	-	-	-	-	-	0.11	-	-	-	-	-	0.11	-	< 0.025
1,1,2-trichloroethane	**5.05E-02**	mg/kg	-	-	-	-	-	-	< 0.025	-	-	-	-	-	< 0.025	-	< 0.025
Trichloroethylene (TCE)	3.55E-02	mg/kg	-	-	-	-	-	-	< 0.0050	-	-	-	-	-	< 0.0050	-	< 0.0050
Benzene	**2.86E-02**	mg/kg	< 0.0050	< 0.0050	< 0.0050	< 0.0050	-	-	< 0.0050	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Toluene	2.16E+02	mg/kg	< 0.020	< 0.020	< 0.020	< 0.020	-	-	< 0.020	< 0.020	-	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Ethylbenzene	7.01E+01	mg/kg	< 0.010	< 0.010	< 0.010	< 0.010	-	-	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	0.018	< 0.010	< 0.010
Xylenes, Total	**9.40E+00**	mg/kg	< 0.040	< 0.040	< 0.040	< 0.040	-	-	0.048	< 0.040	-	< 0.040	< 0.040	< 0.040	0.062	< 0.040	< 0.040
Styrene	4.23E+02	mg/kg	< 0.030	< 0.030	< 0.030	< 0.030	-	-	< 0.030	< 0.030	-	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030
1,2,4-Trichlorobenzene	1.31E+01	mg/kg	-	-	-	-	-	-	< 0.025	-	-	-	-	-	< 0.025	-	< 0.025
Acetone	4.64E+02	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Maximum Allowable Soil Concentration	Unit															
Location			K19-TP17-09	K19-TP17-11	K19-TP17-12	K19-TP17-13	K19-TP17-13	K19-TP17-13	K19-TP17-14	K19-TP17-15	K19-TP17-15	K19-TP17-15	K19-TP17-16	K19-TP17-16	K19-TP17-16	K19-TP17-17	K19-TP17-18
Sample Name			03346-09	03351-03	03351-08	03351-11	03351-12	03352-02	03352-08	03352-11	03353-01	03353-04	03347-07	03347-08	03347-11	03348-01	03349-01
Sample Date			1/24/2017	1/24/2017	1/24/2017	1/24/2017	1/24/2017	1/24/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017
Sample Depth			2.5-2.5 m	2.5-2.5 m	2.4-2.4 m	0.6-0.6 m	1.6-1.6 m	3.4-3.4 m	3.4-3.4 m	1.6-1.6 m	3.5-3.5 m	4.9-4.9 m	1.5-1.5 m	1.5-1.5 m	4.2-4.2 m	1.5-1.5 m	3.4-3.4 m
SYS_SAMPLE_CODE			QL7835	QL7858	QL7863	QL7866	QL7867	QL7871	QL7877	QL7880	QM7176	QM7179	QL7845	QL7846	QL7849	QL7851	QM7146
PARENT_SAMPLE_CODE														QL7845			
SAMPLE_TYPE_CODE			N	N	N	N	N	N	N	N	N	N	N	FD	N	N	N
FIELD_SDG			B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B708210	B708210	B706358	B706358	B706358	B706358	B708210
PAH																	
Naphthalene	**1.21E+01**	mg/kg	0.018	0.018	< 0.010	-	0.030	0.054	0.027	< 0.010	0.11	0.25	3.0	2.1	0.30	< 0.010	0.032
VOC																	
Bromodichloromethane (BDCM)	1.76E+00	mg/kg	< 0.050	-	< 0.050	-	-	< 0.050	< 0.050	-	< 0.050	< 0.050	0.061	0.11	< 0.050	< 0.050	< 0.050
Chlorobenzene	1.09E+00	mg/kg	< 0.025	-	< 0.025	-	-	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Chloroform	2.03E+00	mg/kg	< 0.050	-	< 0.050	-	-	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg	< 0.10	-	< 0.10	-	-	< 0.10	0.22	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg	< 0.025	-	< 0.025	-	-	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,1-dichloroethane	5.91E+00	mg/kg	< 0.025	-	< 0.025	-	-	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-dichloroethane	2.11E-01	mg/kg	< 0.025	-	< 0.025	-	-	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg	< 0.025	-	< 0.025	-	-	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
1,3-dichloropropene (Trans)	5.84E-02	mg/kg	< 0.050	-	< 0.050	-	-	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg	< 0.025	-	< 0.025	-	-	0.17	< 0.025	-	< 0.025	< 0.025	8.4	12	< 0.025	< 0.025	< 0.025
1,1,2-trichloroethane	**5.05E-02**	mg/kg	< 0.025	-	< 0.025	-	-	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Trichloroethylene (TCE)	3.55E-02	mg/kg	< 0.0050	-	< 0.0050	-	-	< 0.0050	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Benzene	**2.86E-02**	mg/kg	< 0.0050	< 0.0050	< 0.0050	< 0.0050	-	< 0.0050	< 0.0050	-	< 0.0050	0.0072	< 0.0050	0.0065	< 0.0050	< 0.0050	< 0.0050
Toluene	2.16E+02	mg/kg	< 0.020	< 0.020	< 0.020	< 0.020	-	< 0.020	0.099	-	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Ethylbenzene	7.01E+01	mg/kg	< 0.010	< 0.010	< 0.010	< 0.010	-	< 0.010	< 0.010	-	0.012	0.037	0.27	0.43	0.021	< 0.010	< 0.010
Xylenes, Total	**9.40E+00**	mg/kg	< 0.040	< 0.040	< 0.040	< 0.040	-	< 0.040	< 0.040	-	< 0.040	0.13	0.10	0.15	0.061	< 0.040	< 0.040
Styrene	4.23E+02	mg/kg	< 0.030	< 0.030	< 0.030	< 0.030	-	< 0.030	< 0.030	-	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030
1,2,4-Trichlorobenzene	1.31E+01	mg/kg	< 0.025	-	< 0.025	-	-	< 0.025	< 0.025	-	< 0.025	< 0.025	0.22	0.22	< 0.025	< 0.025	< 0.025
Acetone	4.64E+02	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

	Location	K19-TP17-18	K19-TP17-18	K19-TP17-19	K19-TP17-19	K19-TP17-20	K19-TP17-20	K19-TP17-23	K19-TP17-23	K19-TP17-24	K19-TP17-24	K19-TP17-25	K19-TP17-27	K19-TP17-27	K19-TP17-28	K19-TP17-28
	Sample Name	03349-02	03350-07	03349-05	03349-07	03349-10	03350-01	03354-09	03354-11	03355-05	03355-07	03355-10	03356-03	03356-04	03356-09	03356-11
	Sample Date	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/27/2017	1/27/2017
	Sample Depth	4-4 m	2.5-2.5 m	2.6-2.6 m	4-4 m	2.5-2.5 m	4.1-4.1 m	2.1-2.1 m	3.2-3.2 m	2.5-2.5 m	4-4 m	2.5-2.5 m	3.5-3.5 m	4.6-4.6 m	2.6-2.6 m	4.3-4.3 m
	SYS_SAMPLE_CODE	QM7147	QM7164	QM7150	QM7152	QM7155	QM7158	QM7196	QM7198	QM7207	QM7209	QM7212	QM7217	QM7218	QM7223	QM7225
	PARENT_SAMPLE_CODE															
	SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	FIELD_SDG	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210
Parameter	**Maximum Allowable Soil Concentration**	**Unit**															
PAH																	
Naphthalene	**1.21E+01**	mg/kg	0.26	0.031	0.011	0.11	0.029	0.21	< 0.010	0.78	0.080	0.22	0.018	< 0.010	0.012	< 0.010	0.017
VOC																	
Bromodichloromethane (BDCM)	1.76E+00	mg/kg	< 0.050	-	-	< 0.050	< 0.050	-	-	< 0.050	< 0.050	-	-	< 0.050	< 0.050	< 0.050	< 0.050
Chlorobenzene	1.09E+00	mg/kg	< 0.025	-	-	< 0.025	< 0.025	-	-	< 0.025	< 0.025	-	-	< 0.025	< 0.025	< 0.025	< 0.025
Chloroform	2.03E+00	mg/kg	< 0.050	-	-	< 0.050	< 0.050	-	-	< 0.050	< 0.050	-	-	< 0.050	< 0.050	< 0.050	< 0.050
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg	< 0.10	-	-	< 0.10	< 0.10	-	-	0.26	< 0.10	-	-	< 0.10	0.38	< 0.10	< 0.10
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg	< 0.025	-	-	< 0.025	< 0.025	-	-	< 0.025	< 0.025	-	-	< 0.025	< 0.025	< 0.025	< 0.025
1,1-dichloroethane	5.91E+00	mg/kg	< 0.025	-	-	< 0.025	< 0.025	-	-	< 0.025	< 0.025	-	-	< 0.025	< 0.025	< 0.025	< 0.025
1,2-dichloroethane	2.11E-01	mg/kg	< 0.025	-	-	< 0.025	< 0.025	-	-	< 0.025	< 0.025	-	-	< 0.025	< 0.025	< 0.025	< 0.025
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg	< 0.025	-	-	< 0.025	< 0.025	-	-	< 0.025	< 0.025	-	-	< 0.025	< 0.025	< 0.025	< 0.025
1,3-dichloropropene (Trans)	5.84E-02	mg/kg	< 0.050	-	-	< 0.050	< 0.050	-	-	< 0.050	< 0.050	-	-	< 0.050	< 0.050	< 0.050	< 0.050
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg	< 0.025	-	-	< 0.025	< 0.025	-	-	< 0.025	< 0.025	-	-	< 0.025	< 0.025	< 0.025	< 0.025
1,1,2-trichloroethane	**5.05E-02**	mg/kg	< 0.025	-	-	< 0.025	< 0.025	-	-	< 0.025	< 0.025	-	-	< 0.025	< 0.025	< 0.025	< 0.025
Trichloroethylene (TCE)	3.55E-02	mg/kg	< 0.0050	-	-	< 0.0050	< 0.0050	-	-	< 0.0050	< 0.0050	-	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Benzene	**2.86E-02**	mg/kg	< 0.0050	-	-	< 0.0050	< 0.0050	< 0.0050	-	0.0064	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Toluene	2.16E+02	mg/kg	< 0.020	-	-	< 0.020	< 0.020	< 0.020	-	0.055	< 0.020	-	0.028	< 0.020	< 0.020	< 0.020	< 0.020
Ethylbenzene	7.01E+01	mg/kg	< 0.010	-	-	< 0.010	< 0.010	0.029	-	0.14	< 0.010	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Xylenes, Total	**9.40E+00**	mg/kg	< 0.040	-	-	< 0.040	< 0.040	0.080	-	0.33	< 0.040	-	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Styrene	4.23E+02	mg/kg	< 0.030	-	-	< 0.030	< 0.030	< 0.030	-	< 0.030	< 0.030	-	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030
1,2,4-Trichlorobenzene	1.31E+01	mg/kg	< 0.025	-	-	< 0.025	< 0.025	-	-	< 0.025	< 0.025	-	-	< 0.025	< 0.025	< 0.025	< 0.025
Acetone	4.64E+02	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Maximum Allowable Soil Concentration	Unit															
Location			K19-TP17-30	K19-TP17-30	K19-TP17-30	K19-TP17-31	K19-TP17-32	K19-TP17-32	K19-TP17-33	K19-TP17-34	K19-TP17-35	K19-TP17-36	K19-TP17-36	K19-TP17-37	K19-TP17-38	K19-TP17-39	K19-TP17-39
Sample Name			03357-09	03357-12	03358-01	03361-04	03361-08	03361-11	03362-03	03362-07	03363-03	03358-05	03358-07	03359-01	03359-06	03364-11	03364-12
Sample Date			1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/28/2017	1/28/2017	1/28/2017	1/28/2017	1/28/2017	1/29/2017	1/29/2017
Sample Depth			1.5-1.5 m	3.2-3.2 m	4.6-4.6 m	2.5-2.5 m	1.4-1.4 m	3.5-3.5 m	2.4-2.4 m	1.5-1.5 m	3.4-3.4 m	2.4-2.4 m	4.1-4.1 m	4-4 m	3.5-3.5 m	1.5-1.5 m	1.5-1.5 m
SYS_SAMPLE_CODE			QM7236	QM7239	QM7241	QM7271	QM7275	QM7278	QM7283	QM7287	QM7295	QM7245	QM7247	QM7253	QM7258	QM7315	QM7316
PARENT_SAMPLE_CODE																	QM7315
SAMPLE_TYPE_CODE			N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD
FIELD_SDG			B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210
PAH																	
Naphthalene	**1.21E+01**	mg/kg	< 0.010	0.043	0.069	0.013	< 0.010	0.046	0.012	< 0.010	0.038	< 0.010	0.35	0.27	0.015	0.021	0.12
VOC																	
Bromodichloromethane (BDCM)	1.76E+00	mg/kg	< 0.050	< 0.050	-	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	-	-
Chlorobenzene	1.09E+00	mg/kg	< 0.025	< 0.025	-	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-
Chloroform	2.03E+00	mg/kg	< 0.050	< 0.050	-	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	-	-
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg	0.15	< 0.10	-	0.31	< 0.10	-	0.19	< 0.10	< 0.10	< 0.10	< 0.10	-	0.19	-	-
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg	< 0.025	< 0.025	-	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-
1,1-dichloroethane	5.91E+00	mg/kg	< 0.025	< 0.025	-	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-
1,2-dichloroethane	2.11E-01	mg/kg	< 0.025	< 0.025	-	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg	< 0.025	< 0.025	-	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-
1,3-dichloropropene (Trans)	5.84E-02	mg/kg	< 0.050	< 0.050	-	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	< 0.050	-	-
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg	< 0.025	< 0.025	-	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-
1,1,2-trichloroethane	**5.05E-02**	mg/kg	< 0.025	< 0.025	-	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-
Trichloroethylene (TCE)	3.55E-02	mg/kg	< 0.0050	< 0.0050	-	< 0.0050	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.016	-	< 0.0050	-	-
Benzene	**2.86E-02**	mg/kg	< 0.0050	< 0.0050	-	< 0.0050	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Toluene	2.16E+02	mg/kg	< 0.020	< 0.020	-	0.063	< 0.020	-	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	0.024	< 0.020	< 0.020
Ethylbenzene	7.01E+01	mg/kg	< 0.010	< 0.010	-	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	< 0.010	0.042	0.014	< 0.010	< 0.010	< 0.010
Xylenes, Total	**9.40E+00**	mg/kg	< 0.040	< 0.040	-	< 0.040	< 0.040	-	< 0.040	< 0.040	< 0.040	< 0.040	0.19	0.043	< 0.040	< 0.040	< 0.040
Styrene	4.23E+02	mg/kg	< 0.030	< 0.030	-	< 0.030	< 0.030	-	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030
1,2,4-Trichlorobenzene	1.31E+01	mg/kg	< 0.025	< 0.025	-	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025	-	-
Acetone	4.64E+02	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Maximum Allowable Soil Concentration	Unit															
Location			K19-TP17-39	K19-TP17-39	K19-TP17-40	K19-TP17-41	K19-TP17-42	K19-TP17-43	K19-TP17-44	K19-TP17-44	K19-TP17-44	K19-TP17-44	K19-TP17-45	K19-TP17-46	K19-TP17-47	K19-TP17-49	K19-TP17-49
Sample Name			03365-03	03365-04	03365-06	03363-10	03364-04	03364-06	03359-10	03359-11	03365-11	03365-12	06685-04	06685-11	06686-02	06688-03	06688-06
Sample Date			1/29/2017	1/29/2017	1/29/2017	1/28/2017	1/28/2017	1/28/2017	1/29/2017	1/29/2017	1/29/2017	1/29/2017	1/30/2017	1/30/2017	1/30/2017	1/30/2017	1/30/2017
Sample Depth			4-4 m	5.1-5.1 m	1.5-1.5 m	4.3-4.3 m	4.3-4.3 m	1.4-1.4 m	3.4-3.4 m	4.2-4.2 m	1.7-1.7 m	1.7-1.7 m	2.5-2.5 m	3.4-3.4 m	1.6-1.6 m	2.4-2.4 m	4.1-4.1 m
SYS_SAMPLE_CODE			QM7322	QM7323	QM7325	QM7302	QM7308	QM7310	QM7262	QM7263	QM7330	QM7331	QN1552	QN1559	QN1568	QN1582	QN1585
PARENT_SAMPLE_CODE												QM7330					
SAMPLE_TYPE_CODE			N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N
FIELD_SDG			B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B709132	B709132	B709132	B709132	B709132
PAH																	
Naphthalene	**1.21E+01**	mg/kg	0.24	0.43	< 0.010	0.22	0.027	0.015	0.018	-	< 0.010	< 0.010	< 0.010	0.019	< 0.010	0.029	0.49
VOC																	
Bromodichloromethane (BDCM)	1.76E+00	mg/kg	< 0.050	0.082	< 0.050	-	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-
Chlorobenzene	1.09E+00	mg/kg	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-
Chloroform	2.03E+00	mg/kg	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-
Dichloromethane (DCM) (Methylene Chloride	1.02E+01	mg/kg	< 0.10	< 0.10	< 0.10	-	< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-
1,1-dichloroethane	5.91E+00	mg/kg	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-
1,2-dichloroethane	2.11E-01	mg/kg	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-
1,3-dichloropropene (Trans)	5.84E-02	mg/kg	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-
1,1,2-trichloroethane	**5.05E-02**	mg/kg	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-
Trichloroethylene (TCE)	3.55E-02	mg/kg	< 0.0050	< 0.0050	< 0.0050	-	< 0.0050	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	-
Benzene	**2.86E-02**	mg/kg	< 0.0050	0.0051	< 0.0050	< 0.0050	< 0.0050	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Toluene	2.16E+02	mg/kg	< 0.020	0.023	< 0.020	< 0.020	< 0.020	< 0.020	-	< 0.020	< 0.020	< 0.020	0.24	< 0.020	< 0.020	< 0.020	0.024
Ethylbenzene	7.01E+01	mg/kg	0.048	0.098	< 0.010	0.040	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.023	0.081
Xylenes, Total	**9.40E+00**	mg/kg	0.21	0.44	< 0.040	0.17	< 0.040	< 0.040	-	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	0.34
Styrene	4.23E+02	mg/kg	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	-	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030
1,2,4-Trichlorobenzene	1.31E+01	mg/kg	< 0.025	< 0.025	< 0.025	-	< 0.025	< 0.025	-	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-
Acetone	4.64E+02	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Maximum Allowable Soil Concentration	Unit	Location	K19-TP17-51-SA1	K19-TP17-51-SA5	K19-TP17-52-SA1	K19-TP17-52-SA1	K19-TP17-52-SA3	K19-TP17-52-SA4	K19-TP17-53-SA1	K19-TP17-53-SA2	K19-TP17-54-SA1	K19-TP17-54-SA4	K19-TP17-55-SA1	K19-TP17-55-SA2	K19-TP17-55-SA3	K19-TP17-55-SA4	K19-TP17-56-SA2
			Sample Name	03796-01	03796-05	03796-06	03796-07	03796-09	03796-10	03796-11	03796-12	03820-03	03820-07	03820-08	03820-09	03820-10	03820-11	03821-02
			Sample Date	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/15/2017
			Sample Depth	0.7-0.7 m	4.9-4.9 m	0.8-0.8 m	0.8-0.8 m	2.9-2.9 m	4-4 m	0.8-0.8 m	1.9-1.9 m	0.7-0.7 m	4.1-4.1 m	0.5-0.5 m	1.8-1.8 m	3-3 m	4-4 m	1.5-1.5 m
			SYS_SAMPLE_CODE	8565765-03796-	8565779-03796-	8565794-03796-	8565799-03796-	8565802-03796-	8565804-03796-	8565805-03796-	8565806-03796-	8565809-03820-	8565813-03820-	8565814-03820-	8565815-03820-	8565816-03820-	8565817-03820-	8565820-03821-
			PARENT_SAMPLE_CODE				8565794-03796-											
			SAMPLE_TYPE_CODE	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N
			FIELD_SDG	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668
PAH																		
Naphthalene	**1.21E+01**	mg/kg		-	-	0.022	0.026	0.020	-	< 0.005	< 0.005	< 0.005	0.187	-	< 0.005	-	< 0.005	< 0.005
VOC																		
Bromodichloromethane (BDCM)	1.76E+00	mg/kg		-	-	< 0.05	< 0.05	-	-	-	-	-	-	-	-	< 0.05	-	-
Chlorobenzene	1.09E+00	mg/kg		-	-	< 0.05	< 0.05	-	-	-	-	-	-	-	-	< 0.05	-	-
Chloroform	2.03E+00	mg/kg		-	-	0.07	0.05	-	-	-	-	-	-	-	-	< 0.05	-	-
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg		-	-	< 0.05	< 0.05	-	-	-	-	-	-	-	-	< 0.05	-	-
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg		-	-	< 0.05	< 0.05	-	-	-	-	-	-	-	-	< 0.05	-	-
1,1-dichloroethane	5.91E+00	mg/kg		-	-	< 0.05	< 0.05	-	-	-	-	-	-	-	-	< 0.05	-	-
1,2-dichloroethane	2.11E-01	mg/kg		-	-	< 0.05	< 0.05	-	-	-	-	-	-	-	-	< 0.05	-	-
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg		-	-	< 0.05	< 0.05	-	-	-	-	-	-	-	-	< 0.05	-	-
1,3-dichloropropene (Trans)	5.84E-02	mg/kg		-	-	< 0.05	< 0.05	-	-	-	-	-	-	-	-	< 0.05	-	-
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg		-	-	< 0.05	< 0.05	-	-	-	-	-	-	-	-	< 0.05	-	-
1,1,2-trichloroethane	**5.05E-02**	mg/kg		-	-	< 0.05	< 0.05	-	-	-	-	-	-	-	-	< 0.05	-	-
Trichloroethylene (TCE)	3.55E-02	mg/kg		-	-	< 0.01	< 0.01	-	-	-	-	-	-	-	-	< 0.01	-	-
Benzene	**2.86E-02**	mg/kg		-	-	< 0.02	< 0.02	-	< 0.02	-	< 0.02	< 0.02	< 0.02	< 0.02	-	< 0.02	< 0.02	-
Toluene	2.16E+02	mg/kg		< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	-
Ethylbenzene	7.01E+01	mg/kg		-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	-
Xylenes, Total	**9.40E+00**	mg/kg		-	-	< 0.2	< 0.2	-	< 0.1	-	< 0.1	< 0.1	< 0.1	< 0.1	-	< 0.2	< 0.1	-
Styrene	4.23E+02	mg/kg		-	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	-
1,2,4-Trichlorobenzene	1.31E+01	mg/kg		-	-	< 0.05	< 0.05	-	-	-	-	-	-	-	-	< 0.05	-	-
Acetone	4.64E+02	mg/kg		-	-	0.8	0.6	-	-	-	-	-	-	-	-	< 0.5	-	-

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Maximum Allowable Soil Concentration	Unit	Location	K19-TP17-56-SA3	K19-TP17-56-SA4	K19-TP17-57-SA1	K19-TP17-57-SA1	K19-TP17-57-SA4	K19-TP17-58-SA3	K19-TP17-58-SA4	K19-TP17-59-SA3	K19-TP17-60-SA4	K19-TP17-60-SA5	K19-TP17-61-SA1	K19-TP17-61-SA2	K19-TP17-61-SA5	K19-TP17-62-SA1	K19-TP17-62-SA1
			Sample Name	03821-03	03821-04	03821-05	03821-06	03821-09	03821-12	03822-01	03822-05	03822-10	03822-11	03822-12	03823-01	03823-04	03823-05	03823-06
			Sample Date	7/15/2017	7/15/2017	7/15/2017	7/15/2017	7/15/2017	7/15/2017	7/15/2017	7/15/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017
			Sample Depth	2.5-2.5 m	4-4 m	0.6-0.6 m	0.6-0.6 m	4-4 m	2.5-2.5 m	4-4 m	2.6-2.6 m	3.7-3.7 m	4.2-4.2 m	0.6-0.6 m	1.5-1.5 m	4.4-4.4 m	0.6-0.6 m	0.6-0.6 m
			SYS_SAMPLE_CODE	8565821-03821-	8565822-03821-	8565823-03821-	8565824-03821-	8565827-03821-	8565830-03821-	8565831-03822-	8565835-03822-	8565862-03822-	8565877-03822-	8565900-03822-	8582689-03823-	8582692-03823-	8582693-03823-	8582695-03823-
			PARENT_SAMPLE_CODE				8565823-03821-											8582693-03823-
			SAMPLE_TYPE_CODE	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	FD
			FIELD_SDG	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N240971	17N240971	17N240971	17N240971
PAH																		
Naphthalene	**1.21E+01**	mg/kg		-	< 0.005	< 0.005	-	< 0.005	< 0.005	0.015	< 0.005	0.012	0.084	-	< 0.005	0.025	< 0.005	< 0.005
VOC																		
Bromodichloromethane (BDCM)	1.76E+00	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	-
Chlorobenzene	1.09E+00	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	-
Chloroform	2.03E+00	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	-
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	-
1,1-dichloroethane	5.91E+00	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	-
1,2-dichloroethane	2.11E-01	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	-
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	-
1,3-dichloropropene (Trans)	5.84E-02	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	-
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	-
1,1,2-trichloroethane	**5.05E-02**	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	-
Trichloroethylene (TCE)	3.55E-02	mg/kg		-	< 0.01	< 0.01	< 0.01	-	-	< 0.01	< 0.01	< 0.01	-	-	< 0.01	-	-	-
Benzene	**2.86E-02**	mg/kg		< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	-	< 0.02	< 0.02	< 0.02	-	-
Toluene	2.16E+02	mg/kg		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-
Ethylbenzene	7.01E+01	mg/kg		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-
Xylenes, Total	**9.40E+00**	mg/kg		< 0.1	< 0.2	< 0.2	< 0.2	< 0.1	< 0.1	< 0.2	< 0.2	< 0.2	-	< 0.1	< 0.2	< 0.1	-	-
Styrene	4.23E+02	mg/kg		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-
1,2,4-Trichlorobenzene	1.31E+01	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	-	-	< 0.05	-	-	-
Acetone	4.64E+02	mg/kg		-	< 0.5	< 0.5	< 0.5	-	-	< 0.5	< 0.5	< 0.5	-	-	< 0.5	-	-	-

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Maximum Allowable Soil Concentration	Unit	Location	K19-TP17-62-SA2	K19-TP17-62-SA3	K19-TP17-62-SA5	K19-TP17-63-SA2	K19-TP17-63-SA4	K19-TP17-64-SA3	K19-TP17-64-SA4	K19-TP17-65-SA2	K19-TP17-65-SA2	K19-TP17-65-SA3	K19-TP17-65-SA4	K19-TP17-66-SA2	K19-TP17-66-SA3	K19-TP17-67-SA1	K19-TP17-67-SA3
			Sample Name	03823-07	03823-08	03823-10	03823-12	03824-02	03824-05	03824-06	03824-08	03824-09	03824-10	03824-11	03825-01	03825-02	03825-04	03825-07
			Sample Date	7/16/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017
			Sample Depth	1.7-1.7 m	2.5-2.5 m	4.2-4.2 m	1.9-1.9 m	4-4 m	2.6-2.6 m	4.2-4.2 m	1.5-1.5 m	1.5-1.5 m	2.6-2.6 m	4.1-4.1 m	1.6-1.6 m	2.5-2.5 m	0.5-0.5 m	2.5-2.5 m
			SYS_SAMPLE_CODE	8582697-03823-	8582698-03823-	8582700-03823-	8582704-03823-	8582706-03824-	8582711-03824-	8582712-03824-	8582723-03824-	8582729-03824-	8582730-03824-	8582741-03824-	8582754-03825-	8582762-03825-	8582764-03825-	8582768-03825-
			PARENT_SAMPLE_CODE									8582723-03824-						
			SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N
			FIELD_SDG	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971
PAH																		
Naphthalene	**1.21E+01**	mg/kg		-	< 0.005	-	< 0.005	0.027	0.006	-	< 0.005	< 0.005	-	0.208	< 0.005	-	-	< 0.005
VOC																		
Bromodichloromethane (BDCM)	1.76E+00	mg/kg		-	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05
Chlorobenzene	1.09E+00	mg/kg		-	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05
Chloroform	2.03E+00	mg/kg		-	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg		-	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg		-	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05
1,1-dichloroethane	5.91E+00	mg/kg		-	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05
1,2-dichloroethane	2.11E-01	mg/kg		-	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg		-	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05
1,3-dichloropropene (Trans)	5.84E-02	mg/kg		-	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg		-	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05
1,1,2-trichloroethane	**5.05E-02**	mg/kg		-	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05
Trichloroethylene (TCE)	3.55E-02	mg/kg		-	-	-	< 0.01	-	-	< 0.01	-	-	< 0.01	-	-	< 0.01	-	< 0.01
Benzene	**2.86E-02**	mg/kg		< 0.02	-	< 0.02	< 0.02	< 0.02	-	< 0.02	-	-	< 0.02	-	-	< 0.02	< 0.02	< 0.02
Toluene	2.16E+02	mg/kg		< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05
Ethylbenzene	7.01E+01	mg/kg		< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05
Xylenes, Total	**9.40E+00**	mg/kg		< 0.1	-	< 0.1	< 0.2	< 0.1	-	< 0.2	-	-	< 0.2	-	-	< 0.2	< 0.1	< 0.2
Styrene	4.23E+02	mg/kg		< 0.05	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	-	-	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	1.31E+01	mg/kg		-	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05
Acetone	4.64E+02	mg/kg		-	-	-	< 0.5	-	-	< 0.5	-	-	< 0.5	-	-	< 0.5	-	< 0.5

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Maximum Allowable Soil Concentration	Unit	Location	K19-TP17-68-SA1	K19-TP17-68-SA3	K19-TP17-68-SA5	K19-TP17-69-SA3	K19-TP17-69-SA5	K19-TP17-70-SA3	K19-TP17-70-SA4	K19-TP17-70-SA5	K19-TP17-71-SA1	K19-TP17-71-SA3	K19-TP17-71-SA3	K19-TP17-72-SA3	K19-TP17-73-SA2	K19-TP17-74-SA2	K19-TP17-74-SA2
			Sample Name	03825-09	03825-11	03826-01	03826-04	03826-06	03826-10	03826-11	03826-12	03827-01	03827-03	03827-04	03827-08	03827-11	03828-02	03828-03
			Sample Date	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/19/2017	7/19/2017	7/20/2017	7/20/2017
			Sample Depth	0.6-0.6 m	2.5-2.5 m	4.1-4.1 m	2.6-2.6 m	5.1-5.1 m	2.4-2.4 m	3.5-3.5 m	4.9-4.9 m	0.5-0.5 m	2.5-2.5 m	2.5-2.5 m	2.4-2.4 m	1.4-1.4 m	1.6-1.6 m	1.6-1.6 m
			SYS_SAMPLE_CODE	8582770-03825-	8582774-03825-	8582776-03826-	8582779-03826-	8582782-03826-	8582789-03826-	8582791-03826-	8582794-03826-	8582795-03827-	8582809-03827-	8582811-03827-	8582829-03827-	8582833-03827-	8590249-03828-	8590250-03828-
			PARENT_SAMPLE_CODE											8582809-03827-				8590249-03828-
			SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	N	FD	N	N	N	FD
			FIELD_SDG	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N242036	17N242036
PAH																		
Naphthalene	**1.21E+01**	mg/kg		< 0.005	< 0.005	0.218	-	< 0.005	-	-	< 0.005	-	< 0.005	0.006	< 0.005	< 0.005	< 0.005	-
VOC																		
Bromodichloromethane (BDCM)	1.76E+00	mg/kg		-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-
Chlorobenzene	1.09E+00	mg/kg		-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-
Chloroform	2.03E+00	mg/kg		-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg		-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg		-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-
1,1-dichloroethane	5.91E+00	mg/kg		-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-
1,2-dichloroethane	2.11E-01	mg/kg		-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg		-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-
1,3-dichloropropene (Trans)	5.84E-02	mg/kg		-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg		-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-
1,1,2-trichloroethane	**5.05E-02**	mg/kg		-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-
Trichloroethylene (TCE)	3.55E-02	mg/kg		-	< 0.01	-	-	-	-	-	-	-	< 0.01	< 0.01	< 0.01	-	< 0.01	-
Benzene	**2.86E-02**	mg/kg		< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Toluene	2.16E+02	mg/kg		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Ethylbenzene	7.01E+01	mg/kg		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Xylenes, Total	**9.40E+00**	mg/kg		< 0.1	< 0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.2	< 0.2	< 0.2	< 0.1	< 0.2	< 0.1|< 0.1
Styrene	4.23E+02	mg/kg		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	1.31E+01	mg/kg		-	< 0.05	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-
Acetone	4.64E+02	mg/kg		-	< 0.5	-	-	-	-	-	-	-	< 0.5	< 0.5	< 0.5	-	< 0.5	-

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Maximum Allowable Soil Concentration	Unit	Location	K19-TP17-75-SA1	K19-TP17-75-SA4	K19-TP17-76-SA1	K19-TP17-76-SA2	K19-TP17-76-SA4	K19-TP17-77-SA1	K19-TP17-77-SA2	K19-TP17-77-SA4	K19-TP17-78-SA1	K19-TP17-78-SA4	K19-TP17-79-SA4	K19-TP17-80-SA2	K19-TP17-80-SA3	K19-TP17-80-SA4	K19-TP17-80-SA5
			Sample Name	03828-06	03828-09	03828-10	03828-11	03829-02	03829-03	03829-04	03829-06	03829-07	03829-10	03840-03	03840-05	03840-06	03840-07	03840-08
			Sample Date	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017
			Sample Depth	0.6-0.6 m	3-3 m	0.7-0.7 m	1.7-1.7 m	3.2-3.2 m	0.6-0.6 m	1.7-1.7 m	3.3-3.3 m	0.7-0.7 m	3.2-3.2 m	3-3 m	1.4-1.4 m	2.6-2.6 m	3.7-3.7 m	4.3-4.3 m
			SYS_SAMPLE_CODE	8590253-03828-	8590256-03828-	8590257-03828-	8590258-03828-	8590275-03829-	8590288-03829-	8590289-03829-	8590298-03829-	8590299-03829-	8590309-03829-	8590500-03840-	8590502-03840-	8590503-03840-	8590505-03840-	8590506-03840-
			PARENT_SAMPLE_CODE															
			SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
			FIELD_SDG	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036
PAH																		
Naphthalene	**1.21E+01**	mg/kg		< 0.005	-	-	< 0.005	0.225	-	< 0.005	0.089	< 0.005	0.048	0.019	< 0.005	0.021	0.011	-
VOC																		
Bromodichloromethane (BDCM)	1.76E+00	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-
Chlorobenzene	1.09E+00	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-
Chloroform	2.03E+00	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-
1,1-dichloroethane	5.91E+00	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-
1,2-dichloroethane	2.11E-01	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-
1,3-dichloropropene (Trans)	5.84E-02	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-
1,1,2-trichloroethane	**5.05E-02**	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-
Trichloroethylene (TCE)	3.55E-02	mg/kg		< 0.01	-	-	-	< 0.01	-	-	< 0.01	-	< 0.01	-	-	< 0.01	-	-
Benzene	**2.86E-02**	mg/kg		< 0.02	< 0.02	< 0.02	-	< 0.02	< 0.02	-	< 0.02	< 0.02	< 0.02	< 0.02	-	< 0.02	-	< 0.02
Toluene	2.16E+02	mg/kg		< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05
Ethylbenzene	7.01E+01	mg/kg		< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05
Xylenes, Total	**9.40E+00**	mg/kg		< 0.2	< 0.1|< 0.1	< 0.1|< 0.1	-	< 0.2	< 0.1|< 0.1	-	< 0.2	< 0.1|< 0.1	< 0.2	< 0.1|< 0.1	-	< 0.2	-	< 0.1|< 0.1
Styrene	4.23E+02	mg/kg		< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05
1,2,4-Trichlorobenzene	1.31E+01	mg/kg		< 0.05	-	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	-	< 0.05	-	-
Acetone	4.64E+02	mg/kg		< 0.5	-	-	-	< 0.5	-	-	< 0.5	-	< 0.5	-	-	< 0.5	-	-

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Maximum Allowable Soil Concentration	Unit	Location	K19-TP17-81-SA1	K19-TP17-81-SA3	K19-TP17-82-SA2	K19-TP17-82-SA2	K19-TP17-82-SA3	K19-TP17-82-SA4	K19-TP17-83-SA2	K19-TP17-83-SA4	K19-TP17-84-SA2	K19-TP17-85-SA2	K19-TP17-85-SA3	K19-TP17-86-SA1	K19-TP17-86-SA4	K19-TP17-87-SA3	K19-TP17-87-SA5
			Sample Name	03840-09	03840-11	03841-02	03841-03	03841-04	03841-05	03841-07	03841-09	03841-12	03842-04	03842-05	03842-08	03842-11	03843-02	03843-04
			Sample Date	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017
			Sample Depth	0.6-0.6 m	2.6-2.6 m	1.4-1.4 m	1.4-1.4 m	2.5-2.5 m	4.2-4.2 m	1.5-1.5 m	3.9-3.9 m	1.6-1.6 m	1.5-1.5 m	2.5-2.5 m	0.7-0.7 m	4-4 m	2.8-2.8 m	4.8-4.8 m
			SYS_SAMPLE_CODE	8590507-03840-	8590509-03840-	8590523-03841-	8590524-03841- 8590523-03841-	8590527-03841-	8590528-03841-	8590530-03841-	8590545-03841-	8590548-03841-	8590569-03842-	8590572-03842-	8590576-03842-	8590581-03842-	8590588-03843-	8590591-03843-
			PARENT_SAMPLE_CODE															
			SAMPLE_TYPE_CODE	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N
			FIELD_SDG	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036
PAH																		
Naphthalene	**1.21E+01**	mg/kg		< 0.005	< 0.005	0.008	< 0.005	< 0.005	-	< 0.005	0.159	< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.005	0.027
VOC																		
Bromodichloromethane (BDCM)	1.76E+00	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	-	-	< 0.05
Chlorobenzene	1.09E+00	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	-	-	< 0.05
Chloroform	2.03E+00	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	-	-	< 0.05
Dichloromethane (DCM) (Methylene Chlorid	1.02E+01	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	-	-	< 0.05
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	-	-	< 0.05
1,1-dichloroethane	5.91E+00	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	-	-	< 0.05
1,2-dichloroethane	2.11E-01	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	-	-	< 0.05
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	-	-	< 0.05
1,3-dichloropropene (Trans)	5.84E-02	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	-	-	< 0.05
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	-	-	0.13
1,1,2-trichloroethane	**5.05E-02**	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	-	-	< 0.05
Trichloroethylene (TCE)	3.55E-02	mg/kg		-	< 0.01	< 0.01	< 0.01	-	-	-	-	-	< 0.01	-	-	-	-	< 0.01
Benzene	**2.86E-02**	mg/kg		< 0.02	< 0.02	< 0.02	< 0.02	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	-	< 0.02	< 0.02	< 0.02	< 0.02
Toluene	2.16E+02	mg/kg		< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05
Ethylbenzene	7.01E+01	mg/kg		< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05
Xylenes, Total	**9.40E+00**	mg/kg		< 0.1|< 0.1	< 0.2	< 0.2	< 0.2	-	< 0.1|< 0.1	< 0.1|< 0.1	< 0.1|< 0.1	< 0.1|< 0.1	< 0.2	-	< 0.1|< 0.1	< 0.1|< 0.1	< 0.1|< 0.1	< 0.2
Styrene	4.23E+02	mg/kg		< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	1.31E+01	mg/kg		-	< 0.05	< 0.05	< 0.05	-	-	-	-	-	< 0.05	-	-	-	-	< 0.05
Acetone	4.64E+02	mg/kg		-	< 0.5	< 0.5	< 0.5	-	-	-	-	-	< 0.5	-	-	-	-	< 0.5

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
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- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-5: Site Wide Soil Screening -
K19 - Trutch Former Townsite
Alaska Highway, BC

		Location	L08-10TP-01-1	L08-10TP-01-2
		Sample Name	L08-10TP-01-1	L08-10TP-01-2
		Sample Date	9/28/2010	9/28/2010
		Sample Depth		
		SYS_SAMPLE_CODE	X42078	X42079
		PARENT_SAMPLE_CODE		
		SAMPLE_TYPE_CODE	N	N
		FIELD_SDG	B094863	B094863
Parameter	**Maximum Allowable Soil Concentration**	**Unit**		
PAH				
Naphthalene	**1.21E+01**	mg/kg	0.81	1.7
VOC				
Bromodichloromethane (BDCM)	1.76E+00	mg/kg	< 0.050	< 0.050
Chlorobenzene	1.09E+00	mg/kg	< 0.025	< 0.025
Chloroform	2.03E+00	mg/kg	< 0.050	< 0.050
Dichloromethane (DCM) (Methylene Chloride	1.02E+01	mg/kg	< 0.10	< 0.10
1,2-dibromoethane (Ethylene Dibromide) (ED	**5.55E-02**	mg/kg	< 0.025	< 0.025
1,1-dichloroethane	5.91E+00	mg/kg	< 0.025	< 0.025
1,2-dichloroethane	2.11E-01	mg/kg	< 0.025	< 0.025
1,2-dichloropropane (Propylene Dichloride)	1.12E-01	mg/kg	< 0.025	< 0.025
1,3-dichloropropene (Trans)	5.84E-02	mg/kg	< 0.050	< 0.050
1,1,2,2-tetrachloroethane	1.59E+01	mg/kg	< 0.025	< 0.025
1,1,2-trichloroethane	**5.05E-02**	mg/kg	< 0.025	< 0.025
Trichloroethylene (TCE)	3.55E-02	mg/kg	< 0.010	< 0.010
Benzene	**2.86E-02**	mg/kg	< 0.0050	< 0.0070
Toluene	2.16E+02	mg/kg	< 0.050	0.073
Ethylbenzene	7.01E+01	mg/kg	0.011	0.17
Xylenes, Total	**9.40E+00**	mg/kg	< 0.10	0.94
Styrene	4.23E+02	mg/kg	< 0.10	< 0.10
1,2,4-Trichlorobenzene	1.31E+01	mg/kg	-	-
Acetone	4.64E+02	mg/kg	-	-

K19 Site Specific SO

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-6: Site Wide Groundwater Screening - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Maximum Allowable Concentration in Water	Unit	Location	K19 DW WELL	K19 DW WELL	K19-09MW-03	K19-09MW-06	K19-09MW-06	K19-09MW-09	K19-10MW-24	K19-10MW10	K19-MW16-01D	K19-MW16-01D	K19-MW16-01D	K19-MW16-01D	K19-MW16-03D	K19-MW16-03D
			Sample Name	DUP-SW-K19	K19 DW WELL	03816-03	03830-02	03830-03	03816-01	03816-04	03375-04	06690-06	3809-03	K19-MW16-01D	K19-MW16-01D	03375-03	3808-05
			Sample Date	6/15/2016	6/15/2016	7/21/2017	7/16/2017	7/16/2017	7/21/2017	7/21/2017	2/4/2017	2/8/2017	7/15/2017	3/11/2016	6/17/2016	2/4/2017	7/14/2017
			Sample Depth														
			SYS_SAMPLE_CODE	OV9109	OV9110	8590128-03816-	8582954-03830-	8582957-03830-	8590033-03816-	8590131-03816-	QN4369	QN9072	8565586-3809-03	OH3620	OW6900	QN4368	8565752-3808-05
			PARENT_SAMPLE_CODE		OV9109			8582954-03830-									
			SAMPLE_TYPE_CODE	N	FD	N	N	FD	N	N	N	N	N	N	N	N	N
			FIELD_SDG	B648667	B648667	17N242036	17N240971	17N240971	17N242036	17N242036	B709734	B710365	17N238668	B619935	B650178	B709734	17N238668
PAH																	
Naphthalene	1.67E+00	mg/L		0.0021	0.0021	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.0017	< 0.00010	< 0.00005	< 0.00010	< 0.00010	< 0.00010	< 0.00005
VOC																	
Chloroform	6.67E+00	mg/L		< 0.0010	< 0.0010	-	-	-	-	< 0.001	< 0.0010	< 0.0010	< 0.001	< 0.0010	< 0.0010	< 0.0010	-
1,2-dichloroethane	3.04E-01	mg/L		< 0.00050	< 0.00050	-	-	-	-	< 0.001	< 0.00050	< 0.00050	< 0.001	< 0.00050	< 0.00050	< 0.00050	-
Benzene	**6.61E-02**	mg/L		< 0.00040	< 0.00040	< 0.0005	< 0.0005	< 0.0005	< 0.0005	-	0.0017	< 0.00040	0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.0005
Ethylbenzene	3.11E+01	mg/L		< 0.00040	< 0.00040	< 0.0005	< 0.0005	< 0.0005	< 0.0005	-	< 0.00040	< 0.00040	< 0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.0005
Toluene	1.85E+02	mg/L		< 0.00040	< 0.00040	< 0.0005	< 0.0005	< 0.0005	< 0.0005	-	< 0.00040	< 0.00040	< 0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.0005
Xylenes, Total	3.69E+00	mg/L		< 0.00040	< 0.00040	< 0.001|< 0.001	< 0.001	< 0.001	< 0.001|< 0.001	-	0.0043	< 0.00040	< 0.001	< 0.00040	< 0.00040	< 0.00040	< 0.001
Methyl tert-Butyl Ether	1.25E+03	mg/L		< 0.0040	< 0.0040	< 0.001	< 0.001	< 0.001	< 0.001	-	< 0.0040	< 0.0040	< 0.001	< 0.0040	< 0.0040	< 0.0040	< 0.001
Styrene	8.93E+01	mg/L		< 0.00050	< 0.00050	< 0.0005	< 0.0005	< 0.0005	< 0.0005	-	< 0.00050	< 0.00050	< 0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.0005
Acetone	1.23E+04	mg/L		-	-	-	-	-	-	-	-	-	< 0.01	-	-	-	-

K19 Site Specific GW

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Output generated by GalReport.

Table J-6: Site Wide Groundwater Screening - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Maximum Allowable Concentration in Water	Unit														
Location			K19-MW16-03D	K19-MW16-03D	K19-MW16-03S	K19-MW16-04	K19-MW16-04	K19-MW16-05	K19-MW16-05	K19-MW16-06	K19-MW16-06	K19-MW16-07D	K19-MW16-07D	K19-MW16-07D	K19-MW16-07D	K19-MW16-07S
Sample Name			K19-MW16-03D	K19-MW16-03D	K19-MW16-03S	K19-MW16-04	K19-MW16-04	03816-02	K19-MW16-05	K19-MW16-06	K19-MW16-06	03815-03	03815-04	K19-MW16-07D	K19-MW16-07D	03797-07
Sample Date			3/15/2016	6/17/2016	6/17/2016	3/15/2016	6/16/2016	7/21/2017	6/18/2016	3/14/2016	6/10/2016	7/20/2017	7/20/2017	3/14/2016	6/18/2016	7/26/2017
Sample Depth																
SYS_SAMPLE_CODE			OH7528	OW6904	OW6905	OH7524	OW6867	8590124-03816-	OW6906	OH7522	OV7199	8590015-03815-	8590019-03815-8590015-03815-FD	OH7523	OW6941	8601486-03797-
PARENT_SAMPLE_CODE																
SAMPLE_TYPE_CODE			N	N	N	N	N	N	N	N	N	N	FD	N	N	N
FIELD_SDG			B620736	B650178	B650178	B620736	B650178	17N242036	B650178	B620736	B648291	17N242036	17N242036	B620736	B650178	17N243826
PAH																
Naphthalene	1.67E+00	mg/L	< 0.00010	< 0.00010	< 0.00010	0.016	0.0073	< 0.00005	< 0.00010	< 0.00010	< 0.00010	< 0.00005	< 0.00005	< 0.00010	< 0.00010	< 0.00005
VOC																
Chloroform	6.67E+00	mg/L	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-	-	-	< 0.0010	< 0.0010	-
1,2-dichloroethane	3.04E-01	mg/L	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	-	< 0.00050	< 0.00050	-	-	-	< 0.00050	< 0.00050	-
Benzene	**6.61E-02**	mg/L	< 0.00040	< 0.00040	< 0.00040	0.0083	0.0097	< 0.0005	< 0.00040	< 0.00040	0.00046	< 0.0005	< 0.0005	< 0.00040	< 0.00040	< 0.0005
Ethylbenzene	3.11E+01	mg/L	< 0.00040	< 0.00040	< 0.00040	0.0052	0.0024	< 0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.0005	< 0.0005	< 0.00040	< 0.00040	< 0.0005
Toluene	1.85E+02	mg/L	0.0021	< 0.00040	< 0.00040	0.0028	0.0019	< 0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.0005	< 0.0005	< 0.00040	< 0.00040	< 0.0005
Xylenes, Total	3.69E+00	mg/L	< 0.00040	< 0.00040	< 0.00040	0.034	0.015	< 0.001|< 0.001	< 0.00040	< 0.00040	< 0.00040	< 0.001|< 0.001	< 0.001|< 0.001	< 0.00040	< 0.00040	< 0.001
Methyl tert-Butyl Ether	1.25E+03	mg/L	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.001	< 0.0040	< 0.0040	< 0.0040	< 0.001	< 0.001	< 0.0040	< 0.0040	< 0.001
Styrene	8.93E+01	mg/L	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.0005	< 0.00050	< 0.00050	< 0.00040	< 0.0005	< 0.0005	< 0.00050	< 0.00050	< 0.0005
Acetone	1.23E+04	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-

K19 Site Specific GW

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Output generated by GalReport.

Table J-6: Site Wide Groundwater Screening - K19 - Trutch Former Townsite Alaska Highway, BC

		Location	K19-MW16-07S	K19-MW16-08	K19-MW16-08	K19-MW16-08	K19-MW16-08	K19-MW16-09	K19-MW16-10D	K19-MW16-10D	K19-MW16-10D	K19-MW16-10S	K19-MW16-10S	K19-MW16-10S	K19-MW16-11	K19-MW16-11
		Sample Name	K19-MW16-07S	K19-MW16-08	K19-MW16-08	K19-MW16-08-	MWD	06689-01	3808-01	K19-MW16-10D	K19-MW16-10D	3808-02	K19-MW16-10S	K19-MW16-10S	K19-MW16-11	K19-MW16-11
		Sample Date	6/19/2016	3/15/2016	6/16/2016	3/15/2016	6/16/2016	2/5/2017	7/13/2017	3/15/2016	6/17/2016	7/13/2017	3/18/2016	6/17/2016	3/16/2016	6/19/2016
		Sample Depth														
		SYS_SAMPLE_CODE	OW6942	OH7526	OW6864	OH7527	OW6865	QN4588	8565629-3808-01	OH7525	OW6899	8565632-3808-02	OI2306	OW6902	OI2300	OW6972
		PARENT_SAMPLE_CODE				OH7526	OW6864									
		SAMPLE_TYPE_CODE	N	N	N	FD	FD	N	N	N	N	N	N	N	N	N
		FIELD_SDG	B650178	B620736	B650178	B620736	B650178	B709775	17N238668	B620736	B650178	17N238668	B621590	B650178	B621590	B650178
Parameter	**Maximum Allowable Concentration in Water**	**Unit**														
PAH																
Naphthalene	1.67E+00	mg/L	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	0.00012	< 0.00005	< 0.00010	< 0.00010	< 0.00005	< 0.00010	< 0.00010	< 0.00010	< 0.00010
VOC																
Chloroform	6.67E+00	mg/L	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	< 0.0010	< 0.0010
1,2-dichloroethane	3.04E-01	mg/L	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	-	< 0.00050	< 0.00050	-	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Benzene	**6.61E-02**	mg/L	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.0005	< 0.00040	< 0.00040	< 0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040
Ethylbenzene	3.11E+01	mg/L	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.0005	< 0.00040	< 0.00040	< 0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040
Toluene	1.85E+02	mg/L	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.0005	< 0.00040	< 0.00040	< 0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040
Xylenes, Total	3.69E+00	mg/L	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.001	< 0.00040	< 0.00040	< 0.001	< 0.00040	< 0.00040	< 0.00040	< 0.00040
Methyl tert-Butyl Ether	1.25E+03	mg/L	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.001	< 0.0040	< 0.0040	< 0.001	< 0.0040	< 0.0040	< 0.0040	< 0.0040
Styrene	8.93E+01	mg/L	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.0005	< 0.00050	< 0.00050	< 0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Acetone	1.23E+04	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-

K19 Site Specific GW

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Output generated by GalReport.

Table J-6: Site Wide Groundwater Screening - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Maximum Allowable Concentration in Water	Unit														
Location			K19-MW16-12D	K19-MW16-12D	K19-MW16-12D	K19-MW16-12S	K19-MW16-12S	K19-MW16-12S	K19-MW16-13	K19-MW16-13	K19-MW16-13-	K19-MW16-14	K19-MW16-14	K19-MW16-14	K19-MW16-14	K19-MW16-15
Sample Name			3808-03	K19-MW16-12D	K19-MW16-12D	3808-04	K19-MW16-12S	K19-MW16-12S	K19-MW16-13	K19-MW16-13	K19-MW16-13-	06690-07	3809-01	K19-MW16-14	K19-MW16-14	K19-MW16-15
Sample Date			7/13/2017	3/16/2016	6/17/2016	7/13/2017	3/18/2016	6/17/2016	3/17/2016	6/8/2016	3/17/2016	2/9/2017	7/15/2017	3/17/2016	6/16/2016	3/17/2016
Sample Depth																
SYS_SAMPLE_CODE			8565682-3808-03	OI2301	OW6901	8565715-3808-04	OI2307	OW6903	OI2303	OU9527	OI2305	QN9073	8565518-3809-01	OI2302	OW6868	OI2304
PARENT_SAMPLE_CODE											OI2303					
SAMPLE_TYPE_CODE			N	N	N	N	N	N	N	N	FD	N	N	N	N	N
FIELD_SDG			17N238668	B621590	B650178	17N238668	B621590	B650178	B621590	B646703	B621590	B710365	17N238668	B621590	B650178	B621590
PAH																
Naphthalene	1.67E+00	mg/L	< 0.00005	< 0.00010	< 0.00010	< 0.00005	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00005	< 0.00010	< 0.00010	0.00012
VOC																
Chloroform	6.67E+00	mg/L	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	< 0.001	< 0.0010	< 0.0010	< 0.0010
1,2-dichloroethane	3.04E-01	mg/L	-	< 0.00050	< 0.00050	-	< 0.00050	< 0.00050	< 0.00050	-	< 0.00050	< 0.00050	< 0.001	< 0.00050	< 0.00050	< 0.00050
Benzene	**6.61E-02**	mg/L	< 0.0005	< 0.00040	< 0.00040	< 0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.0005	< 0.00040	< 0.00040	< 0.00040
Ethylbenzene	3.11E+01	mg/L	< 0.0005	< 0.00040	< 0.00040	< 0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.0005	< 0.00040	< 0.00040	< 0.00040
Toluene	1.85E+02	mg/L	< 0.0005	< 0.00040	< 0.00040	< 0.0005	0.00084	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.0005	< 0.00040	< 0.00040	< 0.00040
Xylenes, Total	3.69E+00	mg/L	< 0.001	< 0.00040	< 0.00040	< 0.001	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.001	< 0.00040	< 0.00040	< 0.00040
Methyl tert-Butyl Ether	1.25E+03	mg/L	< 0.001	< 0.0040	< 0.0040	< 0.001	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.001	< 0.0040	< 0.0040	< 0.0040
Styrene	8.93E+01	mg/L	< 0.0005	< 0.00050	< 0.00050	< 0.0005	< 0.00050	< 0.00050	< 0.00050	< 0.00040	< 0.00050	< 0.00050	< 0.0005	< 0.00050	< 0.00050	< 0.00050
Acetone	1.23E+04	mg/L	-	-	-	-	-	-	-	-	-	-	< 0.01	-	-	-

K19 Site Specific GW

< Indicates parameter was below laboratory equipment detectio
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Output generated by GalReport.

Table J-6: Site Wide Groundwater Screening - K19 - Trutch Former Townsite Alaska Highway, BC

		Location	K19-MW16-15	K19-MW17-01D	K19-MW17-01D	K19-MW17-02	K19-MW17-02	K19-MW17-05	K19-MW17-05	K19-MW17-06	K19-MW17-06	K19-MW17-07	K19-MW17-07	K19-MW17-10	K19-MW17-11	K19-MW17-11
		Sample Name	K19-MW16-15	03375-06	3809-02	03375-05	3809-04	03375-07	03798-01	03815-05	06689-06	03815-02	06690-01	03765-01	03830-01	06706-02
		Sample Date	6/13/2016	2/5/2017	7/15/2017	2/5/2017	7/15/2017	2/5/2017	7/27/2017	7/20/2017	2/6/2017	7/20/2017	2/7/2017	7/25/2017	7/16/2017	2/8/2017
		Sample Depth														
		SYS_SAMPLE_CODE	OV9107	QN4371	8565536-3809-02	QN4370	8565623-3809-04	QN4372	8601487-03798-	8590020-03815-	QN4593	8590013-03815-	QN9067	8598915-03765-	8582939-03830-	QN9113
		PARENT_SAMPLE_CODE														
		SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	N	N	N	N	N
		FIELD_SDG	B648667	B709734	17N238668	B709734	17N238668	B709734	17N243826	17N242036	B709775	17N242036	B710365	17N243343	17N240971	B710365
Parameter	**Maximum Allowable Concentration in Water**	**Unit**														
PAH																
Naphthalene	1.67E+00	mg/L	0.00011	0.00046	< 0.00005	< 0.00010	0.00007	< 0.00010	< 0.00005	0.00005	< 0.00010	< 0.00005	0.00012	< 0.00005	< 0.00005	< 0.00010
VOC																
Chloroform	6.67E+00	mg/L	< 0.0010	-	< 0.001	< 0.0010	-	< 0.0010	< 0.001	< 0.001	< 0.0010	< 0.001	< 0.0010	< 0.001	< 0.001	< 0.0010
1,2-dichloroethane	3.04E-01	mg/L	< 0.00050	-	< 0.001	< 0.00050	-	< 0.00050	< 0.001	< 0.001	< 0.00050	< 0.001	< 0.00050	< 0.001|< 0.001	< 0.001	< 0.00050
Benzene	**6.61E-02**	mg/L	< 0.00040	-	< 0.0005	< 0.00040	< 0.0005	< 0.00040	< 0.0005	-	< 0.00040	-	< 0.00040	< 0.0005	< 0.0005	< 0.00040
Ethylbenzene	3.11E+01	mg/L	< 0.00040	-	< 0.0005	< 0.00040	< 0.0005	< 0.00040	< 0.0005	-	< 0.00040	-	< 0.00040	< 0.0005	< 0.0005	< 0.00040
Toluene	1.85E+02	mg/L	< 0.00040	-	< 0.0005	< 0.00040	< 0.0005	< 0.00040	< 0.0005	-	< 0.00040	-	< 0.00040	< 0.0005	< 0.0005	< 0.00040
Xylenes, Total	3.69E+00	mg/L	< 0.00040	-	< 0.001	< 0.00040	< 0.001	< 0.00040	< 0.001	-	< 0.00040	-	< 0.00040	< 0.001|< 0.001	< 0.001	< 0.00040
Methyl tert-Butyl Ether	1.25E+03	mg/L	< 0.0040	-	< 0.001	< 0.0040	0.005	< 0.0040	< 0.001	-	< 0.0040	-	< 0.0040	< 0.001	< 0.001	< 0.0040
Styrene	8.93E+01	mg/L	< 0.00050	-	< 0.0005	< 0.00050	< 0.0005	< 0.00050	< 0.0005	-	< 0.00050	-	< 0.00050	< 0.0005	< 0.0005	< 0.00050
Acetone	1.23E+04	mg/L	-	-	< 0.01	-	-	-	< 0.01	-	-	-	-	< 0.01	< 0.01	-

K19 Site Specific GW

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Table J-6: Site Wide Groundwater Screening - K19 - Trutch Former Townsite Alaska Highway, BC

	Location	K19-MW17-12	K19-MW17-12	K19-MW17-13	K19-MW17-13	K19-MW17-13	K19A-09MW-01	K19A-09MW-01	K19A-09MW-01	K19A-09MW-01	K19A-09MW-02	K19A-09MW-02	K19A-09MW-02	K19A-09MW-02	K19A-09MW-02
	Sample Name	03815-01	06690-08	03830-04	06690-04	06690-05		03375-01	03375-02	K19A-09MW-01			03830-05	06706-05	K19A-09MW-02
	Sample Date	7/20/2017	2/9/2017	7/16/2017	2/8/2017	2/8/2017	11/7/2009	2/4/2017	2/4/2017	6/10/2016	11/7/2009	11/7/2009	7/16/2017	2/9/2017	6/8/2016
	Sample Depth														
	SYS_SAMPLE_CODE	8590011-03815-	QN9074	8582959-03830-	QN9070	QN9071	K19A-09MW-01	QN4366	QN4367	OV7195	DUP1101	K19A-09MW-02	8582971-03830-	QN9116	OU9528
	PARENT_SAMPLE_CODE					QN9070			QN4366		K19a-09MW-02				
	SAMPLE_TYPE_CODE	N	N	N	N	FD	N	N	FD	N	FD	N	N	N	N
	FIELD_SDG	17N242036	B710365	17N240971	B710365	B710365		B709734	B709734	B648291			17N240971	B710365	B646703
Parameter	**Maximum Allowable Concentration in Water**	**Unit**													
PAH															
Naphthalene	1.67E+00	mg/L	0.00006	0.00014	< 0.00005	0.00030	0.00032	< 0.0003	< 0.00010	< 0.00010	< 0.00010	< 0.0003	< 0.0003	< 0.00005	< 0.00010	< 0.00010
VOC																
Chloroform	6.67E+00	mg/L	-	< 0.0010	< 0.001	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	< 0.0010	-	-	-	< 0.0010	-
1,2-dichloroethane	3.04E-01	mg/L	-	< 0.00050	< 0.001	< 0.00050	< 0.00050	-	< 0.00050	< 0.00050	< 0.00050	-	-	-	< 0.00050	-
Benzene	**6.61E-02**	mg/L	< 0.0005	< 0.00040	< 0.0005	< 0.00040	< 0.00040	-	< 0.00040	< 0.00040	< 0.00040	-	-	< 0.0005	< 0.00040	< 0.00040
Ethylbenzene	3.11E+01	mg/L	< 0.0005	< 0.00040	< 0.0005	< 0.00040	< 0.00040	-	< 0.00040	< 0.00040	< 0.00040	-	-	< 0.0005	< 0.00040	< 0.00040
Toluene	1.85E+02	mg/L	< 0.0005	< 0.00040	< 0.0005	< 0.00040	< 0.00040	-	< 0.00040	< 0.00040	< 0.00040	-	-	< 0.0005	< 0.00040	< 0.00040
Xylenes, Total	3.69E+00	mg/L	< 0.001< 0.001	< 0.00040	< 0.001	< 0.00040	< 0.00040	-	< 0.00040	< 0.00040	< 0.00040	-	-	< 0.001	< 0.00040	< 0.00040
Methyl tert-Butyl Ether	1.25E+03	mg/L	< 0.001	< 0.0040	< 0.001	< 0.0040	< 0.0040	-	< 0.0040	< 0.0040	< 0.0040	-	-	< 0.001	< 0.0040	< 0.0040
Styrene	8.93E+01	mg/L	< 0.0005	< 0.00050	< 0.0005	< 0.00050	< 0.00050	-	< 0.00050	< 0.00050	< 0.00050	-	-	< 0.0005	< 0.00050	< 0.00040
Acetone	1.23E+04	mg/L	-	-	< 0.01	-	-	-	-	-	-	-	-	-	-	-

K19 Site Specific GW

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Table J-6: Site Wide Groundwater Screening - K19 - Trutch Former Townsite Alaska Highway, BC

		Location	K19A-09MW-03	K19A-09MW-03	K19A-09MW-03	K19A-09MW-04	K19A-09MW-05	K19A-09MW-05	K19A-09MW-05	K19A-09MW-06	K19A-09MW-06	K19A-09MW-06	K19A-09MW-07	K19A-09MW-07	K19A-09MW-08	K19A-09MW-09
		Sample Name		06706-04	K19A-09MW-03	K19A-09MW-04		K19A-09MW-05	MWA		06706-01	K19A-09MW-06		K19A-09MW-07	K19A-09MW-08	
		Sample Date	11/7/2009	2/9/2017	6/9/2016	6/7/2016	11/5/2009	6/7/2016	6/7/2016	11/5/2009	2/8/2017	6/7/2016	11/5/2009	6/13/2016	6/13/2016	11/5/2009
		Sample Depth														
		SYS_SAMPLE_CODE	K19A-09MW-03	QN9115	OU9606	OU9525	K19A-09MW-05	OU9519	OU9520	K19A-09MW-06	QN9112	OU9522	K19A-09MW-07	OV9102	OV9103	K19A-09MW-09
		PARENT_SAMPLE_CODE							OU9519							
		SAMPLE_TYPE_CODE	N	N	N	N	N	N	FD	N	N	N	N	N	N	N
		FIELD_SDG		B710365	B646703	B646703		B646703	B646703		B710365	B646703		B648667	B648667	
Parameter	**Maximum Allowable Concentration in Water**	**Unit**														
PAH																
Naphthalene	1.67E+00	mg/L	-	< 0.00010	< 0.00010	< 0.00010	< 0.0003	< 0.00010	< 0.00010	< 0.0003	0.00012	< 0.00010	< 0.0003	< 0.00010	< 0.00010	< 0.0003
VOC																
Chloroform	6.67E+00	mg/L	< 0.0003	< 0.0010	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	< 0.0003	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
1,2-dichloroethane	3.04E-01	mg/L	< 0.0004	< 0.00050	< 0.00050	< 0.00050	-	< 0.00050	< 0.00050	< 0.0004	< 0.00050	< 0.00050	-	< 0.00050	< 0.00050	-
Benzene	**6.61E-02**	mg/L	< 0.0001	< 0.00040	< 0.00040	< 0.00040	-	< 0.00040	< 0.00040	< 0.0001	< 0.00040	< 0.00040	-	< 0.00040	< 0.00040	-
Ethylbenzene	3.11E+01	mg/L	< 0.0001	< 0.00040	< 0.00040	< 0.00040	-	< 0.00040	< 0.00040	< 0.0001	< 0.00040	< 0.00040	-	< 0.00040	< 0.00040	-
Toluene	1.85E+02	mg/L	< 0.0001	< 0.00040	< 0.00040	< 0.00040	-	< 0.00040	< 0.00040	< 0.0001	< 0.00040	< 0.00040	-	< 0.00040	< 0.00040	-
Xylenes, Total	3.69E+00	mg/L	< 0.0001	< 0.00040	< 0.00040	< 0.00040	-	< 0.00040	< 0.00040	< 0.0001	< 0.00040	< 0.00040	-	< 0.00040	< 0.00040	-
Methyl tert-Butyl Ether	1.25E+03	mg/L	-	< 0.0040	< 0.0040	< 0.0040	-	< 0.0040	< 0.0040	-	< 0.0040	< 0.0040	-	< 0.0040	< 0.0040	-
Styrene	8.93E+01	mg/L	< 0.0001	< 0.00050	< 0.00050	< 0.00050	-	< 0.00050	< 0.00050	< 0.0001	< 0.00050	< 0.00050	-	< 0.00050	< 0.00050	-
Acetone	1.23E+04	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-

K19 Site Specific GW

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Table J-6: Site Wide Groundwater Screening - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Maximum Allowable Concentration in Water	Unit													
Location			K19A-09MW-09	K19A-09MW-09	K19A-09MW-10	K19A-09MW-11	K19A-10MW-02	K19A-10MW-02	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	K19A-10MW-04	K19A-10MW-04
Sample Name			06706-03	K19A-09MW-09	K19A-09MW-10		K19A-10MW-02	K19A-10MW-02	06690-02	3808-06	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	SAMPLE E	K19A-10MW-04	K19A-10MW-04
Sample Date			2/8/2017	6/16/2016	6/16/2016	11/7/2009	9/12/2010	6/10/2016	2/7/2017	7/14/2017	8/26/2010	9/12/2010	6/16/2016	6/16/2016	9/13/2010	6/15/2016
Sample Depth																
SYS_SAMPLE_CODE			QN9114	OW6860	OW6861	K19A-09MW-11	W94459	OV7196	QN9068	8565760-3808-06	W62838	W94460	OW6897	OW6898	X00787	OV9108
PARENT_SAMPLE_CODE														OW6897		
SAMPLE_TYPE_CODE			N	N	N	N	N	N	N	N	N	N	N	FD	N	N
FIELD_SDG			B710365	B650178	B650178		B085207	B648291	B710365	17N238668	B078852	B085207	B650178	B650178	B086989	B648667
PAH																
Naphthalene	1.67E+00	mg/L	< 0.00010	< 0.00010	< 0.00010	0.0051	0.00010	< 0.00010	< 0.00010	< 0.00005	< 0.000050	< 0.000050	< 0.00010	< 0.00010	0.00053	< 0.00010
VOC																
Chloroform	6.67E+00	mg/L	< 0.0010	< 0.0010	< 0.0010	-	-	< 0.0010	< 0.0010	< 0.001	-	-	< 0.0010	< 0.0010	< 0.0010	< 0.0010
1,2-dichloroethane	3.04E-01	mg/L	< 0.00050	< 0.00050	< 0.00050	-	-	< 0.00050	< 0.00050	< 0.001	-	-	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Benzene	**6.61E-02**	mg/L	< 0.00040	< 0.00040	< 0.00040	-	< 0.00040	< 0.00040	< 0.00040	< 0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00050	< 0.00040
Ethylbenzene	3.11E+01	mg/L	< 0.00040	< 0.00040	< 0.00040	-	< 0.00040	< 0.00040	< 0.00040	< 0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00050	< 0.00040
Toluene	1.85E+02	mg/L	< 0.00040	< 0.00040	< 0.00040	-	< 0.00040	< 0.00040	< 0.00040	< 0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00050	< 0.00040
Xylenes, Total	3.69E+00	mg/L	< 0.00040	< 0.00040	< 0.00040	-	< 0.00040	< 0.00040	< 0.00040	< 0.001	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.0010	< 0.00040
Methyl tert-Butyl Ether	1.25E+03	mg/L	< 0.0040	< 0.0040	< 0.0040	-	< 0.0040	< 0.0040	< 0.0040	< 0.001	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040
Styrene	8.93E+01	mg/L	< 0.00050	< 0.00050	< 0.00050	-	< 0.00040	< 0.00050	< 0.00050	< 0.0005	< 0.00040	< 0.00040	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Acetone	1.23E+04	mg/L	-	-	-	-	-	-	-	< 0.01	-	-	-	-	-	-

K19 Site Specific GW

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Table J-6: Site Wide Groundwater Screening - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Maximum Allowable Concentration in Water	Unit													
Location			K19A-10MW-05	K19A-10MW-05	K19A-10MW-06	K19A-10MW-07	K19A-10MW-07	K19A-10MW-09	K19A-10MW-09	K19A-10MW-10	K19A-10MW-10	K19A-10MW-10	K19A-10MW-19	K19A-10MW-19	K19A-10MW-20	K19A-10MW-20
Sample Name			K19A-10MW-05	K19A-10MW-05	K19A-10MW-06	K19A-10MW-07	K19A-10MW-07	K19A-10MW-09	K19A-10MW-09	DUP-02	K19A-10MW-10	K19A-10MW-10	K19A-10MW-19	K19A-10MW-19	06689-02	K19A-10MW-20
Sample Date			9/11/2010	6/7/2016	9/13/2010	9/11/2010	6/7/2016	9/13/2010	6/7/2016	9/13/2010	9/13/2010	6/8/2016	9/11/2010	6/13/2016	2/5/2017	9/11/2010
Sample Depth													6-9 m			7.5-10.5 m
SYS_SAMPLE_CODE			W94461	OU9521	X00788	W94462	OU9524	X00789	OU9523	X00794	X00790	OU9526	W94463	OV9104	QN4589	W94464
PARENT_SAMPLE_CODE										X00790						
SAMPLE_TYPE_CODE			N	N	N	N	N	N	N	FD	N	N	N	N	N	N
FIELD_SDG			B085207	B646703	B086989	B085207	B646703	B086989	B646703	B086989	B086989	B646703	B085207	B648667	B709775	B085207
PAH																
Naphthalene	1.67E+00	mg/L	< 0.000050	< 0.00010	< 0.000050	0.000052	< 0.00010	< 0.000050	< 0.00010	0.0021	0.0022	0.00040	0.00040	< 0.00010	< 0.00010	0.00014
VOC																
Chloroform	6.67E+00	mg/L	-	-	-	-	-	-	-	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
1,2-dichloroethane	3.04E-01	mg/L	-	-	-	-	-	-	-	-	< 0.00050	< 0.00050	-	< 0.00050	< 0.00050	-
Benzene	**6.61E-02**	mg/L	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.0017	0.0012	0.00072	< 0.00040	< 0.00040	< 0.00040	< 0.00040
Ethylbenzene	3.11E+01	mg/L	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	0.00068	0.00061	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040
Toluene	1.85E+02	mg/L	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	0.00049	< 0.00050	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040
Xylenes, Total	3.69E+00	mg/L	< 0.00040	< 0.00040	< 0.00040	0.00052	< 0.00040	< 0.00040	< 0.00040	0.016	0.0098	0.0010	< 0.00040	< 0.00040	< 0.00040	< 0.00040
Methyl tert-Butyl Ether	1.25E+03	mg/L	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040
Styrene	8.93E+01	mg/L	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00050	< 0.00050	< 0.00040	< 0.00050	< 0.00050	< 0.00040
Acetone	1.23E+04	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-

K19 Site Specific GW

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Table J-6: Site Wide Groundwater Screening - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Maximum Allowable Concentration in Water	Unit	Location	K19A-10MW-20	K19A-10MW-21	K19A-10MW-21	K19A-10MW-21	K19A-10MW-22	K19A-10MW-22	K19A-10MW-24	K19A-10MW-24	K19A-10MW-24	K19A-10MW-25	K19A-10MW-25	K19A-10MW-25	K19A-10MW-26	K19A-10MW-26
			Sample Name	K19A-10MW-20	06689-03	K19A-10MW-21	K19A-10MW-21	K19A-10MW22	K19A-10MW-22	06689-04	06689-05	K19A-10MW-24	DUP-03	K19A-10MW-25	K19A-10MW-25	K19A-10MW-26	K19A-10MW-26
			Sample Date	6/16/2016	2/5/2017	9/10/2010	6/16/2016	6/16/2016	9/12/2010	2/6/2017	2/6/2017	9/17/2010	9/13/2010	9/13/2010	6/10/2016	9/13/2010	6/11/2016
			Sample Depth			5.7-8.7 m			6-9 m							1.5-4.5 m	
			SYS_SAMPLE_CODE	OW6862	QN4590	W94465	OW6866	OW6863	W94466	QN4591	QN4592	X20718	X00795	X00791	OV7197	X00792	OV7201
			PARENT_SAMPLE_CODE								QN4591		X00791				
			SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	FD	N	FD	N	N	N	N
			FIELD_SDG	B650178	B709775	B085207	B650178	B650178	B085207	B709775	B709775	B091490	B086989	B086989	B648291	B086989	B648291
PAH																	
Naphthalene	1.67E+00	mg/L		< 0.00010	< 0.00010	0.00037	< 0.00010	< 0.00010	0.000087	< 0.00010	< 0.00010	0.000050	0.0013	0.0013	0.00042	0.0091	0.00090
VOC																	
Chloroform	6.67E+00	mg/L		< 0.0010	< 0.0010	-	< 0.0010	-	-	< 0.0010	< 0.0010	-	-	-	-	< 0.0010	< 0.0010
1,2-dichloroethane	3.04E-01	mg/L		< 0.00050	< 0.00050	-	< 0.00050	-	-	< 0.00050	< 0.00050	-	-	-	-	< 0.00050	< 0.00050
Benzene	**6.61E-02**	mg/L		< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00067	< 0.00040	< 0.00040	0.0070	0.0019
Ethylbenzene	3.11E+01	mg/L		< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	0.0099	0.0016
Toluene	1.85E+02	mg/L		< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	0.0017	0.00055
Xylenes, Total	3.69E+00	mg/L		< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	0.0047	0.0052	< 0.00040	0.0081	0.0015
Methyl tert-Butyl Ether	1.25E+03	mg/L		< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	-	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040
Styrene	8.93E+01	mg/L		< 0.00050	< 0.00050	< 0.00040	< 0.00050	< 0.00040	< 0.00040	< 0.00050	< 0.00050	-	< 0.00040	< 0.00040	< 0.00040	< 0.00050	< 0.00050
Acetone	1.23E+04	mg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-

K19 Site Specific GW

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- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table J-6: Site Wide Groundwater Screening - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Maximum Allowable Concentration in Water	Unit													
Location			K19A-10MW-27	K19A-10MW-27	K19A-10MW-28	K19A-10MW-28	K19A-10MW-28	K19A-10MW-28	K19A-10MW-29	K19A-10MW-29	K19B-09MW-01	K19B-09MW-01	K19B-09MW-02	K19B-09MW-02	K19B-09MW-02	K19B-09MW-03
Sample Name			K19A-10MW-27	K19A-10MW-27	06690-03	K19A-10MW-28	K19A-10MW-28	MWB	K19A-10MW-29	K19A-10MW-29		K19B-09MW-01		K19B-09MW-02	MWF	
Sample Date			9/17/2010	6/10/2016	2/8/2017	9/13/2010	6/9/2016	6/9/2016	6/9/2016	6/10/2016	11/4/2009	9/9/2010	11/4/2009	6/19/2016	6/19/2016	11/4/2009
Sample Depth			7.95-10.95 m			5.7-8.7 m										
SYS_SAMPLE_CODE			X20719	OV7200	QN9069	X00793	OU9607	OU9608	OU9614	OV7198	K19B-09MW-01	W88640	K19B-09MW-02	OW6944	OW6945	K19B-09MW-03
PARENT_SAMPLE_CODE								OU9607							OW6944	
SAMPLE_TYPE_CODE			N	N	N	N	N	FD	N	N	N	N	N	N	FD	N
FIELD_SDG			B091490	B648291	B710365	B086989	B646703	B646703	B646703	B648291		B083804		B650178	B650178	
PAH																
Naphthalene	1.67E+00	mg/L	< 0.000050	< 0.00010	0.00041	0.00043	0.0011	0.00098	0.00015	-	-	< 0.000050	< 0.0003	< 0.00010	< 0.00010	< 0.0003
VOC																
Chloroform	6.67E+00	mg/L	-	-	< 0.0010	-	-	-	-	< 0.0010	< 0.0003	-	< 0.0003	< 0.0010	-	< 0.0003
1,2-dichloroethane	3.04E-01	mg/L	-	-	< 0.00050	-	-	-	-	0.026	< 0.0004	-	< 0.0004	< 0.00050	-	< 0.0004
Benzene	**6.61E-02**	mg/L	< 0.00040	< 0.00040	0.00092	< 0.00040	0.00060	0.00069	-	0.0060	< 0.0001	< 0.00040	< 0.0001	< 0.00040	< 0.00040	< 0.0001
Ethylbenzene	3.11E+01	mg/L	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	-	0.00066	< 0.0001	< 0.00040	< 0.0001	< 0.00040	< 0.00040	< 0.0001
Toluene	1.85E+02	mg/L	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	-	0.00077	< 0.0001	< 0.00040	< 0.0001	< 0.00040	< 0.00040	< 0.0001
Xylenes, Total	3.69E+00	mg/L	< 0.00040	< 0.00040	< 0.00040	0.0050	< 0.00040	0.00040	-	0.00057	0.001	< 0.00040	< 0.0001	< 0.00040	< 0.00040	0.0005
Methyl tert-Butyl Ether	1.25E+03	mg/L	-	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	-	< 0.0040	-	< 0.0040	-	< 0.0040	< 0.0040	-
Styrene	8.93E+01	mg/L	-	< 0.00040	< 0.00050	< 0.00040	< 0.00040	< 0.00040	-	< 0.00050	< 0.0001	< 0.00040	< 0.0001	< 0.00050	< 0.00040	< 0.0001
Acetone	1.23E+04	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-

K19 Site Specific GW

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Table J-6: Site Wide Groundwater Screening - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Maximum Allowable Concentration in Water	Unit														
Location			K19B-09MW-03	K19B-09MW-04	K19B-09MW-04	K19B-09MW-05	K19B-09MW-05	K19B-09MW-06	K19B-09MW-06	K19B-09MW-07	K19B-09MW-07	K19B-09MW-07	K19B-10MW-12	K19B-10MW-12	K19B-10MW-13	K19B-10MW-13
Sample Name			K19B-09MW-03		K19B-09MW-04		K19B-09MW-05		K19B-09MW-06		K19B-09MW-07	K19B-09MW-07	K19B-10MW-12	K19B-10MW-12	K19B-10MW-13	K19B-10MW-13
Sample Date			6/19/2016	11/4/2009	6/19/2016	11/4/2009	6/19/2016	11/4/2009	6/19/2016	11/4/2009	9/9/2010	6/9/2016	9/9/2010	6/19/2016	9/9/2010	6/19/2016
Sample Depth																
SYS_SAMPLE_CODE			OW6948	K19B-09MW-04	OW6949	K19B-09MW-05	OW6943	K19B-09MW-06	OW6974	K19B-09MW-07	W88641	OU9611	W88638	OW6973	W88639	OW6947
PARENT_SAMPLE_CODE																
SAMPLE_TYPE_CODE			N	N	N	N	N	N	N	N	N	N	N	N	N	N
FIELD_SDG			B650178		B650178		B650178		B650178		B083804	B646703	B083804	B650178	B083804	B650178
PAH																
Naphthalene	1.67E+00	mg/L	0.0033|< 0.00010	< 0.0003	< 0.00010	-	< 0.00010	-	< 0.00010	-	0.000063	< 0.00010	0.000066	< 0.00010	< 0.000050	< 0.00010
VOC																
Chloroform	6.67E+00	mg/L	< 0.0010	< 0.0003	< 0.0010	< 0.0003	< 0.0010	< 0.0003	< 0.0010	< 0.0003	< 0.0010	-	-	< 0.0010	-	< 0.0010
1,2-dichloroethane	3.04E-01	mg/L	< 0.00050	< 0.0004	< 0.00050	< 0.0004	< 0.00050	< 0.0004	< 0.00050	< 0.0004	< 0.00050	-	-	< 0.00050	-	< 0.00050
Benzene	**6.61E-02**	mg/L	< 0.00040	< 0.0001	< 0.00040	< 0.0001	< 0.00040	< 0.0001	< 0.00040	< 0.0001	< 0.00050	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040
Ethylbenzene	3.11E+01	mg/L	< 0.00040	< 0.0001	< 0.00040	< 0.0001	< 0.00040	< 0.0001	< 0.00040	< 0.0001	< 0.00050	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040
Toluene	1.85E+02	mg/L	< 0.00040	< 0.0001	< 0.00040	< 0.0001	< 0.00040	< 0.0001	< 0.00040	< 0.0001	< 0.00050	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040
Xylenes, Total	3.69E+00	mg/L	< 0.00040	< 0.0001	< 0.00040	< 0.0001	< 0.00040	< 0.0001	< 0.00040	< 0.0001	< 0.0010	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040
Methyl tert-Butyl Ether	1.25E+03	mg/L	< 0.0040	-	< 0.0040	-	< 0.0040	-	< 0.0040	-	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040
Styrene	8.93E+01	mg/L	< 0.00050	< 0.0001	< 0.00050	< 0.0001	< 0.00050	< 0.0001	< 0.00050	< 0.0001	< 0.00050	< 0.00040	< 0.00040	< 0.00050	< 0.00040	< 0.00050
Acetone	1.23E+04	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-

K19 Site Specific GW

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Table J-6: Site Wide Groundwater Screening - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Maximum Allowable Concentration in Water	Unit													
Location			K19B-10MW-14	K19B-10MW-14	K19B-10MW-14	K19B-10MW-15	K19B-10MW-15	K19B-10MW-15	K19B-10MW-15	K19B-10MW-16	K19B-10MW-16	K19B-10MW-18	K19B-10MW-18	K19-10MW-10	K19-10MW-10	K19-MW17-01S
Sample Name			DUP-01	K19B-10MW-14	K19B-10MW-14	03797-01	K19B-10MW-15	K19B-10MW-15	MWC	K19B-10MW-16	K19B-10MW-16	K19B-10MW-18	K19B-10MW-18	03816-05	03816-06	03844-04
Sample Date			9/9/2010	9/9/2010	6/19/2016	7/26/2017	9/9/2010	6/9/2016	6/9/2016	9/9/2010	6/9/2016	9/9/2010	6/9/2016	7/21/2017	7/21/2017	7/23/2017
Sample Depth												6.6-9.6 m				
SYS_SAMPLE_CODE			W88643	W88635	OW6946	8601479-03797-	W88636	OU9609	OU9610	W88637	OU9612	W88642	OU9613	8590146-03816-	8590147-03816-	8598959-03844-
PARENT_SAMPLE_CODE			W88635						OU9609						8590146-03816-	
SAMPLE_TYPE_CODE			FD	N	N	N	N	N	FD	N	N	N	N	N	FD	N
FIELD_SDG			B083804	B083804	B650178	17N243826	B083804	B646703	B646703	B083804	B646703	B083804	B646703	17N242036	17N242036	17N243343
PAH																
Naphthalene	1.67E+00	mg/L	0.00013	< 0.000050	0.024|< 0.00010	< 0.00005	0.000056	< 0.00010	< 0.00010	0.000092	< 0.00010	0.00015	< 0.00010	0.00065	0.00072	0.0155
VOC																
Chloroform	6.67E+00	mg/L	-	-	< 0.0010	< 0.001	-	< 0.0010	< 0.0010	-	-	-	< 0.0010	-	-	< 0.001
1,2-dichloroethane	3.04E-01	mg/L	-	-	< 0.00050	< 0.001	-	< 0.00050	< 0.00050	-	-	-	< 0.00050	-	-	0.274|0.274
Benzene	**6.61E-02**	mg/L	< 0.00040	< 0.00040	< 0.00040	< 0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	0.0007	0.0008	**1.9**
Ethylbenzene	3.11E+01	mg/L	< 0.00040	< 0.00040	< 0.00040	< 0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.0005	< 0.0005	0.134
Toluene	1.85E+02	mg/L	< 0.00040	< 0.00040	< 0.00040	< 0.0005	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.0005	< 0.0005	0.138
Xylenes, Total	3.69E+00	mg/L	< 0.00040	< 0.00040	< 0.00040	< 0.001	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	0.002|0.002	0.002|0.002	0.146|0.146
Methyl tert-Butyl Ether	1.25E+03	mg/L	< 0.0040	< 0.0040	< 0.0040	< 0.001	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.001	< 0.001	< 0.001
Styrene	8.93E+01	mg/L	< 0.00040	< 0.00040	< 0.00050	< 0.0005	< 0.00040	< 0.00050	< 0.00050	< 0.00040	< 0.00040	< 0.00040	< 0.00050	< 0.0005	< 0.0005	< 0.0005
Acetone	1.23E+04	mg/L	-	-	-	< 0.01	-	-	-	-	-	-	-	-	-	0.328

K19 Site Specific GW

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Table J-6: Site Wide Groundwater Screening - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Maximum Allowable Concentration in Water	Unit	Location	K19-MW17-09	K19-MW17-17	K19-MW17-18	K19-MW17-19	K19-MW17-20	K19-MW17-21	K19-MW17-21	K19-MW17-22	K19-MW17-23	K19-MW17-24	K19-MW17-24	K19-MW17-25	K19-MW17-26	K19-MW17-27
			Sample Name	03765-02	03797-02	03797-03	03765-03	03765-06	03765-04	03765-05	03762-04	03762-03	03797-04	03797-05	03797-06	03763-04	03798-02
			Sample Date	7/25/2017	7/26/2017	7/26/2017	7/25/2017	7/25/2017	7/25/2017	7/25/2017	7/28/2017	7/28/2017	7/26/2017	7/26/2017	7/26/2017	7/30/2017	7/27/2017
			Sample Depth														
			SYS_SAMPLE_CODE	8598916-03765-	8601480-03797-	8601482-03797-	8598917-03765-	8599005-03765-	8598918-03765-	8598919-03765-	8604418-03762-	8604416-03762-	8601483-03797-	8601484-03797-	8601485-03797-	8604456-03763-	8601488-03798-
			PARENT_SAMPLE_CODE							8598918-03765-				8601483-03797-			
			SAMPLE_TYPE_CODE	N	N	N	N	N	N	FD	N	N	N	FD	N	N	N
			FIELD_SDG	17N243343	17N243826	17N243826	17N243343	17N243343	17N243343	17N243343	17N244304	17N244304	17N243826	17N243826	17N243826	17N244304	17N243826
PAH																	
Naphthalene	1.67E+00	mg/L		< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.00006	0.00006	< 0.00005	0.00015	< 0.00005	< 0.00005	< 0.00005	0.00006	< 0.00005
VOC																	
Chloroform	6.67E+00	mg/L		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1,2-dichloroethane	3.04E-01	mg/L		< 0.001|< 0.001	< 0.001	< 0.001	< 0.001|< 0.001	< 0.001|< 0.001	< 0.001|< 0.001	< 0.001|< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Benzene	**6.61E-02**	mg/L		< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Ethylbenzene	3.11E+01	mg/L		< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Toluene	1.85E+02	mg/L		< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Xylenes, Total	3.69E+00	mg/L		< 0.001|< 0.001	< 0.001	< 0.001	< 0.001|< 0.001	< 0.001|< 0.001	< 0.001|< 0.001	< 0.001|< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Methyl tert-Butyl Ether	1.25E+03	mg/L		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Styrene	8.93E+01	mg/L		< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Acetone	1.23E+04	mg/L		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

K19 Site Specific GW

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Table J-6: Site Wide Groundwater Screening - K19 - Trutch Former Townsite Alaska Highway, BC

		Location	K19-MW17-28	K19-MW17-29D	K19-MW17-29S	K19-MW17-30	K19-MW17-31	K19-MW17-32	K19-MW17-33	K19-MW17-34	K19-MW17-35D	K19-MW17-35D	K19-MW17-35S
		Sample Name	03798-03	03762-07	03763-05	03762-01	03762-02	03798-04	03762-05	03762-06	03763-01	03763-02	03763-06
		Sample Date	7/27/2017	7/28/2017	7/30/2017	7/28/2017	7/29/2017	7/27/2017	7/28/2017	7/28/2017	7/29/2017	7/29/2017	7/30/2017
		Sample Depth											
		SYS_SAMPLE_CODE	8601489-03798-	8604432-03762-	8604457-03763-	8604383-03762-	8604393-03762-	8601490-03798-	8604425-03762-	8604429-03762-	8604451-03763-	8604452-03763-	8604470-03763-
		PARENT_SAMPLE_CODE										8604451-03763-	
		SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	FD	N
		FIELD_SDG	17N243826	17N244304	17N244304	17N244304	17N244304	17N243826	17N244304	17N244304	17N244304	17N244304	17N244304
Parameter	**Maximum Allowable Concentration in Water**	**Unit**											
PAH													
Naphthalene	1.67E+00	mg/L	< 0.00005	< 0.00005	0.0235	< 0.00005	0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
VOC													
Chloroform	6.67E+00	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1,2-dichloroethane	3.04E-01	mg/L	< 0.001	< 0.001	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.121	0.122	0.001
Benzene	**6.61E-02**	mg/L	< 0.0005	< 0.0005	0.0538	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	**0.574**	**0.569**	0.0173
Ethylbenzene	3.11E+01	mg/L	< 0.0005	< 0.0005	0.0043	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0005	0.0005	0.0005
Toluene	1.85E+02	mg/L	< 0.0005	< 0.0005	0.0016	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0200	0.0202	< 0.0005
Xylenes, Total	3.69E+00	mg/L	< 0.001	< 0.001	0.006	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	0.001	< 0.001
Methyl tert-Butyl Ether	1.25E+03	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Styrene	8.93E+01	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Acetone	1.23E+04	mg/L	< 0.01	< 0.01	0.058	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

K19 Site Specific GW

< Indicates parameter was below laboratory equipment detectio
> Indicates parameter detected above equipment analytical rang
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

Table 7: VPH + LEPH Calculation For Soil -
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	K19-10TP-03	K19-10TP-05	K19-10TP-09	K19-10TP-11	K19-10TP-17	K19-10TP-17	K19-10TP-30	K19-10TP-42	K19-16-22	K19-BH17-03	K19-BH17-03	K19-BH17-08	K19-BH17-08	K19-BH17-09	K19-BH17-09
Sample Name	K19-10TP-03-3	K19-10TP-05-2	K19-10TP-09-5	K19-10TP-11-2	K19-10TP-17-5	K19-10TP-DUP-2	K19-10TP-30-5	K19-10TP-42-6	01481-04	06696-11	06696-12	06700-07	06700-10	06701-01	06701-02
Sample Date	8/5/2010	8/5/2010	8/5/2010	8/5/2010	8/6/2010	8/6/2010	8/8/2010	8/9/2010	8/30/2016	1/31/2017	1/31/2017	2/4/2017	2/4/2017	2/4/2017	2/4/2017
Sample Depth	0.3-0.91 m	0.3-0.91 m	1.83-2.13 m	0.3-0.6 m	2.75-3.05 m	2.75-3.05 m	2.75-3 m	2.75-3.05 m	2-2 m	3.5-3.5 m	4-4 m	2.5-2.5 m	5.2-5.2 m	2.5-2.5 m	2.5-2.5 m
SYS_SAMPLE_CODE	W04971	W04969	W04966	W04963	W07743	W07746	W07751	W10035	PK6755	QN1622	QN1623	QN6520	QN6523	QN6526	QN6527
PARENT_SAMPLE_CODE						W07743									QN6526
SAMPLE_TYPE_CODE	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	FD
FIELD_SDG	B068158	B068158	B068158	B068158	B068605	B068605	B068605	B069119	B675549	B709132	B709132	B710078	B710078	B710078	B710078
Parameter / **Unit**															
Light Extractable Petroleum Hydrocarbons (BC Guidelines) mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs mg/kg	-	10900	891	< 100	-	-	-	-	160	< 100	-	< 100	< 100	290	240
Volatile Petroleum Hydrocarbons (C6-C10) mg/kg	35	-	-	-	620	690	< 10	520	< 10	-	44	< 10	49	15	14
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH + LEPH mg/kg	35	10900	891	100	620	690	10	520	170	100	44	110	149	305	254
Maximum Allowable Soil Concentration 1.91E+02															

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- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil - K19 - Trutch Former Townsite Alaska Highway, BC

	Location	K19-BH17-09	K19-BH17-15	K19-BH17-15	K19-BH17-16	K19-BH17-16	K19-BH17-16	K19-MW16-01S	K19-MW16-03	K19-MW16-03	K19-MW16-05	K19-MW16-07	K19-MW16-10	K19-MW16-11	K19-MW16-12	K19-MW16-13
	Sample Name	06701-04	06705-03	06705-04	06705-09	06705-10	06705-11	K19-MW16-01S/SA1	K19-MW16-03/SA1	K19-MW16-03/SA2	K19-MW16-05/SA2	K19-MW16-07/SA1	K19-MW16-10/SA1	K19-MW16-11/SA1	K19-MW16-12/SA1	K19-MW16-13/SA2
	Sample Date	2/4/2017	2/7/2017	2/7/2017	2/7/2017	2/7/2017	2/7/2017	3/7/2016	3/8/2016	3/8/2016	3/9/2016	3/10/2016	3/12/2016	3/13/2016	3/13/2016	3/14/2016
	Sample Depth	4.3-4.3 m	3.5-3.5 m	4.3-4.3 m	3.5-3.5 m	4.2-4.2 m	4.2-4.2 m	2-2 m	0.9-1 m	2-2 m	3-3 m	0.76-1.1 m	0.9-1 m	0.9-1 m	0.76-1 m	1-2 m
	SYS_SAMPLE_CODE	QN6529	QN9088	QN9089	QN9094	QN9095	QN9096	OG9364	OG9369	OG9370	OG9409	OG9413	OH3628	OH3630	OH3632	OH7509
	PARENT_SAMPLE_CODE						QN9095									
	SAMPLE_TYPE_CODE	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N
	FIELD_SDG	B710078	B710365	B710365	B710365	B710365	B710365	B619198	B619198	B619198	B619203	B619203	B619935	B619935	B619935	B620735
Parameter	Unit															
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg	< 100	-	< 100	< 100	110	< 100	< 100	< 100	< 100	102	< 100	< 100	< 100	< 100	< 100
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg	-	28	-	25	-	-	< 10	< 10	< 10	14	< 10	< 12	< 10	< 10	< 10
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH + LEPH	mg/kg	100	28	100	125	110	100	110	110	110	116	110	112	110	110	110
Maximum Allowable Soil Concentration	1.91E+02															

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- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit	Location	K19-MW17-01	K19-MW17-01	K19-MW17-01	K19-MW17-01	K19-MW17-01	K19-MW17-05	K19-MW17-05	K19-MW17-05	K19-MW17-05	K19-MW17-06	K19-MW17-06	K19-MW17-06	K19-MW17-06	K19-MW17-07	K19-MW17-07
		Sample Name	03360-02	03360-04	03360-05	03360-08	03360-10	06697-11	06697-12	06698-01	06698-02	06698-09	06698-10	06698-11	06698-12	06699-08	06699-10
		Sample Date	1/30/2017	1/30/2017	1/30/2017	1/30/2017	1/30/2017	2/1/2017	2/1/2017	2/1/2017	2/1/2017	2/2/2017	2/2/2017	2/2/2017	2/2/2017	2/3/2017	2/3/2017
		Sample Depth	1.5-1.5 m	3.5-3.5 m	3.5-3.5 m	6.5-6.5 m	8.6-8.6 m	1.4-1.4 m	2.5-2.5 m	3.5-3.5 m	4.7-4.7 m	2.5-2.5 m	3.5-3.5 m	3.5-3.5 m	4.7-4.7 m	1.5-1.5 m	3.5-3.5 m
		SYS_SAMPLE_CODE	QN1514	QN1516	QN1517	QN1520	QN1522	QN1634	QN1635	QN6490	QN6491	QN6498	QN6499	QN6500	QN6501	QN6509	QN6511
		PARENT_SAMPLE_CODE			QN1516									QN6499			
		SAMPLE_TYPE_CODE	N	N	FD	N	N	N	N	N	N	N	N	FD	N	N	N
		FIELD_SDG	B709132	B709132	B709132	B709132	B709132	B709132	B709132	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg		< 100	320	340	< 100	< 100	< 100	710	-	< 100	< 100	< 100	< 100	< 100	< 100	450
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg		32	410	340	26	20	< 10	13	38	-	< 10	21	24	-	< 10	27
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH + LEPH	mg/kg		132	730	680	126	120	110	723	38	100	110	121	124	100	110	477
Maximum Allowable Soil Concentration	1.91E+02																

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- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit	Location	K19-MW17-07	K19-MW17-10	K19-MW17-10	K19-MW17-11	K19-MW17-11	K19-MW17-12	K19-MW17-12	K19-MW17-13	K19-MW17-13	K19-MW17-14	K19-MW17-14	K19-MW17-14	K19-MW17-14	K19-SS16-01	K19-SS16-02
		Sample Name	06699-12	06701-08	06701-10	06702-05	06702-07	06702-10	06703-01	06703-10	06703-12	06704-06	06704-07	06704-08	06704-09	01481-09	01481-10
		Sample Date	2/3/2017	2/4/2017	2/4/2017	2/5/2017	2/5/2017	2/5/2017	2/5/2017	2/6/2017	2/6/2017	2/7/2017	2/7/2017	2/7/2017	2/7/2017	8/31/2016	8/31/2016
		Sample Depth	4.7-4.7 m	2.5-2.5 m	4.7-4.7 m	3.5-3.5 m	5.5-5.5 m	1.4-1.4 m	3.5-3.5 m	3.5-3.5 m	5.5-5.5 m	2.5-2.5 m	2.5-2.5 m	3.5-3.5 m	4.3-4.3 m	0.27-0.27 m	0.34-0.34 m
		SYS_SAMPLE_CODE	QN6513	QN6533	QN6535	QN6542	QN6544	QN6547	QN6550	QN6559	QN6561	QN9105	QN9106	QN9107	QN9108	PK6760	PK6761
		PARENT_SAMPLE_CODE											QN9105				
		SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N
		FIELD_SDG	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710078	B710365	B710365	B710365	B710365	B675549	B675549
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg		< 100	< 100	< 100	< 100	110	< 100	< 100	< 100	< 100	< 100	< 100	-	210	< 100	< 100
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg		41	10	-	< 10	-	< 10	44	29	46	< 10	< 10	11	-	< 10	< 10
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH + LEPH	mg/kg		141	110	100	110	110	110	144	129	146	110	110	11	210	110	110
Maximum Allowable Soil Concentration	1.91E+02																

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- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit															
Location		K19-SS16-03	K19-SS16-04	K19-TP16-02	K19-TP16-03	K19-TP16-04	K19-TP16-05	K19-TP16-06	K19-TP16-10	K19-TP16-11	K19-TP16-11	K19-TP16-13	K19-TP16-13	K19-TP16-21	K19-TP16-25	K19-TP16-25
Sample Name		01481-11	01481-12	K19-TP16-02/SA2	K19-TP16-03/SA2	K19-TP16-04/SA2	K19-TP16-05/SA1	K19-TP16-06/SA2	K19-TP16-10/SA2	K19-TP16-11/SA2	K19-TP16-11/SA2 DUP	01463-08	01463-09	01480-07	01482-08	01482-10
Sample Date		8/31/2016	8/31/2016	3/7/2016	3/7/2016	3/8/2016	3/8/2016	3/8/2016	3/10/2016	3/10/2016	3/10/2016	8/29/2016	8/29/2016	8/30/2016	8/31/2016	8/31/2016
Sample Depth		0.4-0.4 m	0.32-0.32 m	1.5-1.5 m	2.9-2.9 m	2.2-2.2 m	1.9-1.9 m	2.4-2.4 m	1.9-1.9 m	2-2 m	2-2 m	2.2-2.2 m	3.1-3.1 m	2-2 m	1.6-1.6 m	3.6-3.6 m
SYS_SAMPLE_CODE		PK6762	PK6763	OG9396	OG9398	OG9400	OG9401	OG9376	OG9424	OG9426	OG9427	PK1318	PK1319	PK5709	PK6788	PK6790
PARENT_SAMPLE_CODE											OG9426					
SAMPLE_TYPE_CODE		N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N
FIELD_SDG		B675549	B675549	B619198	B619198	B619198	B619198	B619198	B619206	B619206	B619206	B674520	B674520	B675312	B675549	B675549
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	580	-	< 100	< 100	< 100
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg	-	< 10	< 10	< 10	12	< 10	< 10	< 10	< 10	< 10	24	78	< 10	-	26
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH + LEPH	mg/kg	100	110	110	110	110	112	110	110	110	110	604	78	110	100	126
Maximum Allowable Soil Concentration	1.91E+02															

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- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit															
Location		K19-TP16-27	K19-TP16-27	K19-TP16-27	K19-TP16-31	K19-TP16-31	K19-TP16-36	K19-TP16-36	K19-TP16-37	K19-TP16-41	K19-TP16-41	K19-TP16-43	K19-TP16-43	K19-TP16-47	K19-TP16-47	K19-TP16-47
Sample Name		01483-03	01483-04	01483-06	01485-08	01485-11	01488-01	01488-04	01488-07	01489-12	01490-04	01490-12	01491-02	01492-02	01492-03	01492-05
Sample Date		8/31/2016	8/31/2016	8/31/2016	9/1/2016	9/1/2016	9/2/2016	9/2/2016	9/2/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016	9/3/2016
Sample Depth		0.4-0.4 m	1.5-1.5 m	3.5-3.5 m	0.9-0.9 m	2.8-2.8 m	1-1 m	2.9-2.9 m	2.5-2.5 m	0.7-0.7 m	4-4 m	1.7-1.7 m	3-3 m	1.7-1.7 m	2.5-2.5 m	2.5-2.5 m
SYS_SAMPLE_CODE		PK6795	PK6796	PK6798	PK9459	PK9462	PL2461	PL2464	PL2467	PL2484	PL2488	PL2496	PL2499	PL2511	PL2512	PL2514
PARENT_SAMPLE_CODE																PL2512
SAMPLE_TYPE_CODE		N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD
FIELD_SDG		B675549	B675549	B675549	B675954	B675954	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470	B676470
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg	< 100	< 100	< 100	< 100	130	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg	< 10	< 10	17	< 10	14	< 10	< 10	< 10	-	-	-	< 10	< 10	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH + LEPH	mg/kg	110	110	117	110	144	110	110	110	100	100	100	110	110	100	100
Maximum Allowable Soil Concentration	1.91E+02															

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- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit															
Location		K19-TP16-48	K19-TP16-49	K19-TP16-49	K19-TP16-49	K19-TP17-01	K19-TP17-01	K19-TP17-02	K19-TP17-02	K19-TP17-02	K19-TP17-03	K19-TP17-03	K19-TP17-03	K19-TP17-04	K19-TP17-05	K19-TP17-06
Sample Name		01492-09	01492-11	01492-12	01493-01	03343-03	03343-05	03343-07	03343-08	03343-10	03344-01	03344-02	03344-04	03344-06	03345-01	03345-10
Sample Date		9/3/2016	9/3/2016	9/3/2016	9/3/2016	1/22/2017	1/22/2017	1/22/2017	1/22/2017	1/22/2017	1/22/2017	1/22/2017	1/22/2017	1/23/2017	1/23/2017	1/24/2017
Sample Depth		2.5-2.5 m	2-2 m	1.7-1.7 m	3-3 m	2.4-2.4 m	4.2-4.2 m	1.8-1.8 m	1.8-1.8 m	2.5-2.5 m	1.8-1.8 m	2.5-2.5 m	3.8-3.8 m	2.5-2.5 m	2.6-2.6 m	4.2-4.2 m
SYS_SAMPLE_CODE		PL2518	PL2520	PL2521	PL2522	QL7792	QL7794	QL7796	QL7797	QL7799	QL7802	QL7803	QL7805	QL7807	QL7814	QL7823
PARENT_SAMPLE_CODE									QL7796							
SAMPLE_TYPE_CODE		N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N
FIELD_SDG		B676470	B676470	B676470	B676470	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg	100	< 100	-	< 100	< 100	< 100	< 100	< 100	140	< 100	< 100	< 100	< 100	< 100	110
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg	< 10	-	< 10	< 10	< 10	< 10	-	-	< 10	< 10	-	< 10	< 10	< 10	26
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH + LEPH	mg/kg	110	100	10	110	110	110	100	100	150	110	100	110	110	110	136
Maximum Allowable Soil Concentration	1.91E+02															

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- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil -
K19 - Trutch Former Townsite
Alaska Highway, BC

	Location	K19-TP17-07	K19-TP17-08	K19-TP17-09	K19-TP17-11	K19-TP17-12	K19-TP17-13	K19-TP17-13	K19-TP17-13	K19-TP17-14	K19-TP17-15	K19-TP17-15	K19-TP17-15	K19-TP17-16	K19-TP17-16	K19-TP17-16
	Sample Name	03346-02	03346-05	03346-09	03351-03	03351-08	03351-11	03351-12	03352-02	03352-08	03352-11	03353-01	03353-04	03347-07	03347-08	03347-11
	Sample Date	1/24/2017	1/24/2017	1/24/2017	1/24/2017	1/24/2017	1/24/2017	1/24/2017	1/24/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017
	Sample Depth	3.4-3.4 m	2.5-2.5 m	2.5-2.5 m	2.5-2.5 m	2.4-2.4 m	0.6-0.6 m	1.6-1.6 m	3.4-3.4 m	3.4-3.4 m	1.6-1.6 m	3.5-3.5 m	4.9-4.9 m	1.5-1.5 m	1.5-1.5 m	4.2-4.2 m
	SYS_SAMPLE_CODE	QL7828	QL7831	QL7835	QL7858	QL7863	QL7866	QL7867	QL7871	QL7877	QL7880	QM7176	QM7179	QL7845	QL7846	QL7849
	PARENT_SAMPLE_CODE														QL7845	
	SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N
	FIELD_SDG	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B706358	B708210	B708210	B706358	B706358	B706358
Parameter	Unit															
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg	< 100	< 100	< 100	< 100	< 100	-	650	380	< 100	< 100	740	180	4800	4600	160
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10	-	< 10	< 10	-	14	21	190	340	14
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH + LEPH	mg/kg	110	110	110	110	110	10	650	390	110	100	754	201	4990	4940	174
Maximum Allowable Soil Concentration	1.91E+02															

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil - K19 - Trutch Former Townsite Alaska Highway, BC

Location	K19-TP17-17	K19-TP17-18	K19-TP17-18	K19-TP17-18	K19-TP17-19	K19-TP17-19	K19-TP17-20	K19-TP17-20	K19-TP17-23	K19-TP17-23	K19-TP17-24	K19-TP17-24	K19-TP17-25	K19-TP17-27	K19-TP17-27
Sample Name	03348-01	03349-01	03349-02	03350-07	03349-05	03349-07	03349-10	03350-01	03354-09	03354-11	03355-05	03355-07	03355-10	03356-03	03356-04
Sample Date	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/25/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017
Sample Depth	1.5-1.5 m	3.4-3.4 m	4-4 m	2.5-2.5 m	2.6-2.6 m	4-4 m	2.5-2.5 m	4.1-4.1 m	2.1-2.1 m	3.2-3.2 m	2.5-2.5 m	4-4 m	2.5-2.5 m	3.5-3.5 m	4.6-4.6 m
SYS_SAMPLE_CODE	QL7851	QM7146	QM7147	QM7164	QM7150	QM7152	QM7155	QM7158	QM7196	QM7198	QM7207	QM7209	QM7212	QM7217	QM7218
PARENT_SAMPLE_CODE															
SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
FIELD_SDG	B706358	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210
Parameter / **Unit**															
Light Extractable Petroleum Hydrocarbons (BC Guidelines) mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs mg/kg	< 100	180	< 100	140	< 100	< 100	< 100	< 100	< 100	1300	260	< 100	< 100	190	280
Volatile Petroleum Hydrocarbons (C6-C10) mg/kg	< 10	< 10	< 10	-	-	12	< 10	16	-	26	< 10	-	< 10	< 10	< 10
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH + LEPH mg/kg	110	190	110	140	100	112	110	116	100	1326	270	100	110	200	290
Maximum Allowable Soil Concentration 1.91E+02															

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil - K19 - Trutch Former Townsite Alaska Highway, BC

	Location	K19-TP17-28	K19-TP17-28	K19-TP17-30	K19-TP17-30	K19-TP17-30	K19-TP17-31	K19-TP17-32	K19-TP17-32	K19-TP17-33	K19-TP17-34	K19-TP17-35	K19-TP17-36	K19-TP17-36	K19-TP17-37	K19-TP17-38
	Sample Name	03356-09	03356-11	03357-09	03357-12	03358-01	03361-04	03361-08	03361-11	03362-03	03362-07	03363-03	03358-05	03358-07	03359-01	03359-06
	Sample Date	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017	1/28/2017	1/28/2017	1/28/2017	1/28/2017	1/28/2017
	Sample Depth	2.6-2.6 m	4.3-4.3 m	1.5-1.5 m	3.2-3.2 m	4.6-4.6 m	2.5-2.5 m	1.4-1.4 m	3.5-3.5 m	2.4-2.4 m	1.5-1.5 m	3.4-3.4 m	2.4-2.4 m	4.1-4.1 m	4-4 m	3.5-3.5 m
	SYS_SAMPLE_CODE	QM7223	QM7225	QM7236	QM7239	QM7241	QM7271	QM7275	QM7278	QM7283	QM7287	QM7295	QM7245	QM7247	QM7253	QM7258
	PARENT_SAMPLE_CODE															
	SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	FIELD_SDG	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210
Parameter	Unit															
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg	130	320	< 100	510	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg	< 10	< 10	< 10	10	-	< 10	< 10	-	< 10	< 10	< 10	< 10	13	13	< 10
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH + LEPH	mg/kg	140	330	110	520	100	110	110	100	110	110	110	110	113	113	110
Maximum Allowable Soil Concentration	1.91E+02															

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- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil -
K19 - Trutch Former Townsite
Alaska Highway, BC

	Location	K19-TP17-39	K19-TP17-39	K19-TP17-39	K19-TP17-39	K19-TP17-40	K19-TP17-41	K19-TP17-42	K19-TP17-43	K19-TP17-44	K19-TP17-44	K19-TP17-44	K19-TP17-44	K19-TP17-45	K19-TP17-46	K19-TP17-47
	Sample Name	03364-11	03364-12	03365-03	03365-04	03365-06	03363-10	03364-04	03364-06	03359-10	03359-11	03365-11	03365-12	06685-04	06685-11	06686-02
	Sample Date	1/29/2017	1/29/2017	1/29/2017	1/29/2017	1/29/2017	1/28/2017	1/28/2017	1/28/2017	1/29/2017	1/29/2017	1/29/2017	1/29/2017	1/30/2017	1/30/2017	1/30/2017
	Sample Depth	1.5-1.5 m	1.5-1.5 m	4-4 m	5.1-5.1 m	1.5-1.5 m	4.3-4.3 m	4.3-4.3 m	1.4-1.4 m	3.4-3.4 m	4.2-4.2 m	1.7-1.7 m	1.7-1.7 m	2.5-2.5 m	3.4-3.4 m	1.6-1.6 m
	SYS_SAMPLE_CODE	QM7315	QM7316	QM7322	QM7323	QM7325	QM7302	QM7308	QM7310	QM7262	QM7263	QM7330	QM7331	QN1552	QN1559	QN1568
	PARENT_SAMPLE_CODE		QM7315										QM7330			
	SAMPLE_TYPE_CODE	N	FD	N	N	N	N	N	N	N	N	N	FD	N	N	N
	FIELD_SDG	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B708210	B709132	B709132	B709132
Parameter	Unit															
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg	< 100	340	160	< 100	< 100	< 100	< 100	< 100	< 100	-	< 100	< 100	< 100	< 100	< 100
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg	< 10	< 10	21	38	< 10	20	< 10	< 10	-	< 10	< 10	< 10	< 10	< 10	< 10
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH + LEPH	mg/kg	110	350	181	138	110	120	110	110	100	10	110	110	110	110	110
Maximum Allowable Soil Concentration	1.91E+02															

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- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil -
K19 - Trutch Former Townsite
Alaska Highway, BC

	Location	K19-TP17-49	K19-TP17-49	K19A-09MW-02	K19A-09MW-03	K19A-09MW-03	K19A-09MW-04	K19A-09MW-04	K19A-09MW-04	K19A-09MW-05	K19A-09MW-05	K19A-09MW-05	K19A-09MW-05	K19A-09MW-06	K19A-10BH-08	K19A-10BH-23
	Sample Name	06688-03	06688-06												K19A-10BH-08-3	K19A-10BH-23-6
	Sample Date	1/30/2017	1/30/2017	10/20/2009	10/20/2009	10/22/2009	10/20/2009	10/21/2009	10/21/2009	10/21/2009	10/21/2009	10/21/2009	10/21/2009	10/22/2009	8/15/2010	8/23/2010
	Sample Depth	2.4-2.4 m	4.1-4.1 m	0.6-1.2 m	0-0.6 m	4.3-4.9 m	1.8-2.4 m	1.8-2.4 m	6.7-7.9 m	0-0.6 m	0-0.6 m	1.8-2.4 m	6.4-7 m	6.7-7.3 m	2.1-2.4 m	2.6-2.74 m
	SYS_SAMPLE_CODE	QN1582	QN1585	K19A-09BH-02-2	K19A-09BH-03-1	K19A-09BH-03-6	K19A-09BH-04-3	09-DUP-01	K19A-09BH-04-7	09-DUP-02	K19A-09BH-05-1	K19A-09BH-05-4	K19A-09BH-05-8	K19A-09BH-06-8	W32109	W49067
	PARENT_SAMPLE_CODE							K19a-09BH-04-3		K19a-09BH-05-1						
	SAMPLE_TYPE_CODE	N	N	N	N	N	N	FD	N	FD	N	N	N	N	N	N
	FIELD_SDG	B709132	B709132												B073313	B076441
Parameter	Unit															
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg	430	140	< 250	< 250	-	< 250	< 250	< 250	< 250	< 250	< 250	< 250	-	-	< 100
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg	< 10	17	-	-	< 100	-	-	-	-	-	-	-	< 100	< 10	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	-	-
VPH + LEPH	mg/kg	440	157	350	350	200	350	350	350	350	350	350	350	100	10	100
Maximum Allowable Soil Concentration	1.91E+02															

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- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit	Location	K19A-10MW-03	K19A-10MW-03	K19A-10MW-04	K19A-10MW-04	K19A-10MW-04	K19A-10MW-05	K19A-10MW-05	K19A-10MW-06	K19A-10MW-07	K19A-10MW-07	K19A-10MW-09	K19A-10MW-09	K19A-10MW-21	K19A-10MW-21	K19A-10MW-22
		Sample Name	K19A-10MW-03-2	K19A-10MW-DUP-1	K19A-10MW-04-4	K19A-10MW-04-6	K19A-10MW-04-7	K19A-10MW-05-3	K19-DUP-2	K19A-10MW-06-4	K19A-10MW-07-3	K19A-10MW-DUP-3	K19A-10MW-09-4	K19A-DUP-4	K19A-10MW-21-4	K19A-10MW-21-7	K19A-10MW-22-1
		Sample Date	8/13/2010	8/13/2010	8/14/2010	8/14/2010	8/14/2010	8/14/2010	8/14/2010	8/15/2010	8/15/2010	8/15/2010	8/16/2010	8/16/2010	8/22/2010	8/22/2010	8/22/2010
		Sample Depth	1.22-1.52 m	1.22-1.52 m	2.6-2.75 m	3.8-4 m	4.6-4.8 m	2.4-2.7 m	2.4-2.7 m	3.05-3.35 m	2.6-2.9 m	2.6-2.9 m	2.3-2.6 m	2.3-2.6 m	2.45-2.75 m	3.8-3.95 m	0.1-0.45 m
		SYS_SAMPLE_CODE	W32462	W32490	W32038	W32040	W32041	W32044	W32056	W32095	W32099	W32102	W31964	W31920	W48635	W48638	W48640
		PARENT_SAMPLE_CODE		W32462					W32044			W32099		W31964			
		SAMPLE_TYPE_CODE	N	FD	N	N	N	N	FD	N	N	FD	N	FD	N	N	N
		FIELD_SDG	B073372	B073372	B073302	B073302	B073302	B073302	B073302	B073313	B073313	B073313	B073270	B073270	B076365	B076365	B076365
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg		-	-	-	314	-	-	-	-	-	-	-	-	< 100	< 100	-
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg		< 10	< 10	< 10	20	29	< 10	< 10	< 10	< 10	< 10	< 10	< 10	-	-	< 10
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH + LEPH	mg/kg		10	10	10	334	29	10	10	10	10	10	10	10	100	100	10
Maximum Allowable Soil Concentration	1.91E+02																

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- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit															
Location		K19A-10MW-22	K19A-10MW-22	K19A-10MW-22	K19A-10MW-24	K19A-10MW-24	K19A-10MW-24	K19A-10MW-25	K19A-10MW-27	K19B-09MW-01	K19B-10BH-17	K19B-10MW-12	K19B-10MW-12	K19B-10MW-15	K19B-10MW-15	K19B-10MW-16
Sample Name		K19A-10MW-22-3	K19A-10MW-22-6	K19-DUP-13	K19A-10MW-24-5	K19A-10MW-24-6	K19A-DUP-14	K19A-10MW-25-4	K19A-10MW-27-3		K19B-10BH-17-5	K19B-10MW-12-5	K19-DUP-7	K19B-10MW-15-6	K19-DUP-9	K19B-10MW-16-5
Sample Date		8/22/2010	8/22/2010	8/22/2010	8/24/2010	8/24/2010	8/24/2010	8/24/2010	8/25/2010	10/24/2009	8/20/2010	8/17/2010	8/17/2010	8/19/2010	8/19/2010	8/19/2010
Sample Depth		1.2-1.5 m	3.95-4.25 m	1.2-1.5 m	2.44-2.74 m	3.05-3.35 m	3.05-3.35 m	2.44-2.92 m	1.7-2.15 m	3-3.7 m	3.05-3.66 m	2.45-2.8 m	2.45-2.8 m	3.05-3.35 m	3.05-3.35 m	3.05-3.32 m
SYS_SAMPLE_CODE		W48642	W48645	W48647	W49073	W49074	W49075	W49078	W54446	K19B-09BH-01-4	W48611	W31229	W31231	W37323	W37329	W37328
PARENT_SAMPLE_CODE				W48642			W49074						W31229		W37323	
SAMPLE_TYPE_CODE		N	N	FD	N	N	FD	N	N	N	N	N	FD	N	FD	N
FIELD_SDG		B076365	B076365	B076365	B076441	B076441	B076441	B076441	B077440		B076365	B073095	B073095	B074322	B074322	B074322
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg	659	< 100	-	< 100	1190	431	< 100	< 100	-	< 100	110	< 100	< 100	< 100	< 100
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg	-	-	47	-	-	-	-	-	-	-	< 10	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	-	-	-	-	-	-	< 100	-	-	-	-	-	-
VPH + LEPH	mg/kg	659	100	47	100	1190	431	100	100	100	100	120	100	100	100	100
Maximum Allowable Soil Concentration	1.91E+02															

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> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil -
K19 - Trutch Former Townsite
Alaska Highway, BC

	Location	K19B-10MW-18	K19B-10MW-18	K19-HA17-01-SA2	K19-HA17-06	K19-HA17-06	K19-HA17-07	K19-HA17-08	K19-HA17-08	K19-HD17-01	K19-HD17-02	K19-HD17-03	K19-HD17-04	K19-HD17-07	K19-MW17-17-SA4	K19-MW17-17-SA5
	Sample Name	K19B-10MW-18-5	K19-DUP-10	03811-04	03845-01	03845-03	03606-01	03606-02	03606-03	03776-01	03776-02	03776-03	03776-04	03776-07	03831-04	03831-05
	Sample Date	8/20/2010	8/20/2010	7/17/2017	7/23/2017	7/23/2017	7/29/2017	7/30/2017	7/30/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017	7/18/2017	7/18/2017
	Sample Depth	3-3.65 m	3-3.65 m	0.4-0.6 m	0.5-0.6 m	1.4-1.5 m	0.35-0.5 m	0.3-0.45 m	0.7-1.1 m	0.4-0.4 m	0.4-0.4 m	0.35-0.35 m	0.4-0.4 m	0.3-0.3 m	4.3-4.5 m	5.2-5.8 m
	SYS_SAMPLE_CODE	W48616	W48631	8582879-03811-04	8598960-03845-01	8598962-03845-03	8604446-03606-01	8604447-03606-02	8604449-03606-03	8565902-03776-01	8565909-03776-02	8565911-03776-03	8565912-03776-04	8565915-03776-07	8582992-03831-04	8582993-03831-05
	PARENT_SAMPLE_CODE		W48616													
	SAMPLE_TYPE_CODE	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N
	FIELD_SDG	B076365	B076365	17N240971	17N243343	17N243343	17N244304	17N244304	17N244304	17N238668	17N238668	17N238668	17N238668	17N238668	17N240971	17N240971
Parameter	**Unit**															
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	-	< 20	24	< 20	33	< 20	< 20	101	34	460	-	43	365
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg	< 100	< 100	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	< 10	-	< 10	< 10	< 10	-	-	< 10	< 10	-	< 10	-	28
VPH + LEPH	mg/kg	100	100	10	20	34	30	43	20	20	111	44	460	10	43	393
Maximum Allowable Soil Concentration	1.91E+02															

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit	Location	K19-MW17-17-SA6	K19-MW17-18-SA2	K19-MW17-18-SA4	K19-MW17-18-SA5	K19-MW17-18-SA7	K19-MW17-18-SA9	K19-MW17-19-SA2	K19-MW17-19-SA4	K19-MW17-19-SA6	K19-MW17-20-SA3	K19-MW17-20-SA5	K19-MW17-20-SA5	K19-MW17-21-SA4	K19-MW17-21-SA7	K19-MW17-22-SA3
		Sample Name	03831-06	03831-09	03831-10	03831-12	03832-02	03832-04	03832-06	03832-08	03832-11	03833-03	03833-05	03833-06	03833-10	03834-02	03834-05
		Sample Date	7/18/2017	7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/19/2017	7/20/2017	7/20/2017	7/20/2017	7/21/2017	7/21/2017	7/21/2017
		Sample Depth	6.5-7 m	1.5-1.8 m	4.5-4.8 m	5.2-5.5 m	7.5-8.5 m	12-13 m	1.8-2.1 m	5-6 m	7-8 m	3-3.5 m	5.8-6.8 m	5.8-6.8 m	4.5-5 m	9-10 m	3-3.5 m
		SYS_SAMPLE_CODE	8582994-03831-06	8582998-03831-09	8582999-03831-10	8583001-03831-12	8583004-03832-02	8583006-03832-04	8583009-03832-06	8583011-03832-08	8583016-03832-11	8590368-03833-03	8590370-03833-05	8590372-03833-06	8590381-03833-10	8590417-03834-02	8590421-03834-05
		PARENT_SAMPLE_CODE												8590370-03833-05			
		SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	N	N	FD	N	N	N
		FIELD_SDG	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		292	156	100	98	398	262	119	74	62	57	122	80	66	105	74
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		-	-	38	-	21	22	-	50	57	< 10	32	59	32	56	-
VPH + LEPH	mg/kg		292	156	138	98	419	284	119	124	119	67	154	139	98	161	74
Maximum Allowable Soil Concentration	1.91E+02																

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil -
K19 - Trutch Former Townsite
Alaska Highway, BC

	Location	K19-MW17-22-SA4	K19-MW17-22-SA4	K19-MW17-22-SA6	K19-MW17-22-SA7	K19-MW17-23-SA3	K19-MW17-23-SA4	K19-MW17-23-SA6	K19-MW17-24-SA3	K19-MW17-24-SA4	K19-MW17-25-SA3	K19-MW17-25-SA4	K19-MW17-25-SA5	K19-MW17-26-SA3	K19-MW17-26-SA4	K19-MW17-26-SA5
	Sample Name	03834-06	03834-07	03834-09	03834-10	03835-01	03835-02	03835-04	03835-10	03835-12	03836-03	03836-04	03836-05	03836-08	03836-09	03836-10
	Sample Date	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017
	Sample Depth	4.5-5 m	4.5-5 m	8-8.5 m	9-10 m	3-3.3 m	4.5-5 m	8-8.5 m	3-3.5 m	4.7-5.2 m	3-3.5 m	4.5-5 m	6-6.5 m	3.5-4 m	3.5-4 m	5-5.5 m
	SYS_SAMPLE_CODE	8590423-03834-06	8590427-03834-07	8590432-03834-09	8590434-03834-10	8590466-03835-01	8590469-03835-02	8590477-03835-04	8590483-03835-10	8590485-03835-12	8598922-03836-03	8598923-03836-04	8598924-03836-05	8598927-03836-08	8598928-03836-09	8598929-03836-10
	PARENT_SAMPLE_CODE		8590423-03834-06												8598927-03836-08	
	SAMPLE_TYPE_CODE	N	FD	N	N	N	N	N	N	N	N	N	N	N	FD	N
	FIELD_SDG	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343
Parameter	**Unit**															
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	73	75	122	141	73	92	66	86	78	-	47	-	82	79	68
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	38	-	-	82	38	-	29	-	37	< 10	-	26	20	19	-
VPH + LEPH	mg/kg	111	75	122	223	111	92	95	86	115	10	47	26	102	98	68
Maximum Allowable Soil Concentration	1.91E+02															

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit	Location	K19-MW17-26-SA7	K19-MW17-26-SA8	K19-MW17-27-SA4	K19-MW17-27-SA5	K19-MW17-27-SA7	K19-MW17-28-SA4	K19-MW17-28-SA6	K19-MW17-29-SA3	K19-MW17-29-SA4	K19-MW17-29-SA4	K19-MW17-29-SA6	K19-MW17-30-SA3	K19-MW17-30-SA6	K19-MW17-31-SA1	K19-MW17-31-SA3
		Sample Name	03836-12	03837-01	03837-05	03837-06	03837-08	03838-01	03838-03	03838-06	03838-07	03838-08	03838-10	03839-01	03839-04	03839-05	03839-07
		Sample Date	7/22/2017	7/22/2017	7/23/2017	7/23/2017	7/23/2017	7/23/2017	7/23/2017	7/24/2017	7/24/2017	7/24/2017	7/24/2017	7/25/2017	7/25/2017	7/26/2017	7/26/2017
		Sample Depth	8-8.8 m	11-11.8 m	4.5-5 m	6-6.5 m	8-8.75 m	5-5.5 m	8-8.5 m	2.5-2.8 m	3.4-3.7 m	3.4-3.7 m	5.3-5.5 m	3.5-3.9 m	8-8.7 m	0.3-0.5 m	3.5-4 m
		SYS_SAMPLE_CODE	8598931-03836-12	8598932-03837-01	8598936-03837-05	8598937-03837-06	8598939-03837-08	8598944-03838-01	8598946-03838-03	8598949-03838-06	8598950-03838-07	8598951-03838-08	8598953-03838-10	8601360-03839-01	8601377-03839-04	8601386-03839-05	8601394-03839-07
		PARENT_SAMPLE_CODE										8598950-03838-07					
		SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N
		FIELD_SDG	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243343	17N243826	17N243826	17N243826	17N243826
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		44	108	60	-	112	216	244	857	483	572	56	97	77	< 20	65
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		45	64	-	15	52	< 10	< 10	< 10	30	46	< 10	27	35	-	17
VPH + LEPH	mg/kg		89	172	60	15	164	226	254	867	513	618	66	124	112	20	82
Maximum Allowable Soil Concentration	1.91E+02																

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit	Location	K19-MW17-31-SA5	K19-MW17-31-SA5	K19-MW17-32-SA1	K19-MW17-32-SA3	K19-MW17-32-SA4	K19-MW17-33-SA4	K19-MW17-34-SA3	K19-MW17-34-SA3	K19-MW17-34-SA5	K19-MW17-35-SA2	K19-MW17-35-SA2	K19-MW17-35-SA4	K19-MW17-35-SA6	K19-MW17-35-SA6	K19-MW17-35-SA8
		Sample Name	03839-09	03839-10	03839-11	03846-01	03846-02	03846-06	03846-09	03846-10	03846-12	03847-02	03847-03	03847-05	03847-07	03847-08	03847-10
		Sample Date	7/26/2017	7/26/2017	7/26/2017	7/26/2017	7/26/2017	7/26/2017	7/27/2017	7/27/2017	7/27/2017	7/27/2017	7/27/2017	7/27/2017	7/27/2017	7/27/2017	7/27/2017
		Sample Depth	6.4-6.8 m	6.4-6.8 m	0.3-0.5 m	3.5-4 m	5-5.5 m	5-5.5 m	3.5-4 m	3.5-4 m	6-6.5 m	1-1.5 m	1-1.5 m	2.5-3 m	4-4.5 m	4-4.5 m	6.5-7 m
		SYS_SAMPLE_CODE	8601397-03839-09	8601399-03839-10	8601404-03839-11	8601416-03846-01	8601417-03846-02	8601422-03846-06	8601425-03846-09	8601427-03846-10	8601431-03846-12	8601469-03847-02	8601470-03847-03	8601472-03847-05	8601474-03847-07	8601475-03847-08	8601477-03847-10
		PARENT_SAMPLE_CODE		8601397-03839-09						8601425-03846-09			8601469-03847-02			8601474-03847-07	
		SAMPLE_TYPE_CODE	N	FD	N	N	N	N	N	FD	N	N	FD	N	N	FD	N
		FIELD_SDG	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826	17N243826
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		79	82	< 20	221	81	119	60	63	118	372	307	39	60	76	79
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		31	27	-	< 10	20	24	12	11	21	19	17	< 10	34	42	< 10
VPH + LEPH	mg/kg		110	109	20	231	101	143	72	74	139	391	324	49	94	118	89
Maximum Allowable Soil Concentration	1.91E+02																

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> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit															
Location		K19-TP16-23	K19-TP16-23	K19-TP17-52-SA1	K19-TP17-52-SA1	K19-TP17-52-SA3	K19-TP17-52-SA4	K19-TP17-53-SA1	K19-TP17-53-SA2	K19-TP17-54-SA1	K19-TP17-54-SA4	K19-TP17-55-SA1	K19-TP17-55-SA2	K19-TP17-55-SA3	K19-TP17-55-SA4	K19-TP17-56-SA2
Sample Name		01481-05	01481-07	03796-06	03796-07	03796-09	03796-10	03796-11	03796-12	03820-03	03820-07	03820-08	03820-09	03820-10	03820-11	03821-02
Sample Date		8/30/2016	8/30/2016	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/14/2017	7/15/2017
Sample Depth		0.5-0.5 m	1.5-1.5 m	0.8-0.8 m	0.8-0.8 m	2.9-2.9 m	4-4 m	0.8-0.8 m	1.9-1.9 m	0.7-0.7 m	4.1-4.1 m	0.5-0.5 m	1.8-1.8 m	3-3 m	4-4 m	1.5-1.5 m
SYS_SAMPLE_CODE		PK6756	PK6758	8565794-03796-06	8565799-03796-07	8565802-03796-09	8565804-03796-10	8565805-03796-11	8565806-03796-12	8565809-03820-03	8565813-03820-07	8565814-03820-08	8565815-03820-09	8565816-03820-10	8565817-03820-11	8565820-03821-02
PARENT_SAMPLE_CODE					8565794-03796-06											
SAMPLE_TYPE_CODE		N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N
FIELD_SDG		B675549	B675549	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	-	-	34	44	121	-	< 20	< 20	< 20	49	-	< 20	-	83	< 20
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg	< 100	< 100	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg	< 10	< 10	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	-	-	< 10	< 10	-	< 10	-	< 10	< 10	12	< 10	-	< 10	< 10	-
VPH + LEPH	mg/kg	110	110	44	54	121	10	20	30	30	61	10	20	10	93	20
Maximum Allowable Soil Concentration	1.91E+02															

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit	Location	K19-TP17-56-SA3	K19-TP17-56-SA4	K19-TP17-57-SA1	K19-TP17-57-SA1	K19-TP17-57-SA4	K19-TP17-58-SA3	K19-TP17-58-SA4	K19-TP17-59-SA3	K19-TP17-60-SA4	K19-TP17-60-SA5	K19-TP17-61-SA1	K19-TP17-61-SA2	K19-TP17-61-SA5	K19-TP17-63-SA2	K19-TP17-63-SA4
		Sample Name	03821-03	03821-04	03821-05	03821-06	03821-09	03821-12	03822-01	03822-05	03822-10	03822-11	03822-12	03823-01	03823-04	03823-12	03824-02
		Sample Date	7/15/2017	7/15/2017	7/15/2017	7/15/2017	7/15/2017	7/15/2017	7/15/2017	7/15/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017	7/16/2017
		Sample Depth	2.5-2.5 m	4-4 m	0.6-0.6 m	0.6-0.6 m	4-4 m	2.5-2.5 m	4-4 m	2.6-2.6 m	3.7-3.7 m	4.2-4.2 m	0.6-0.6 m	1.5-1.5 m	4.4-4.4 m	1.9-1.9 m	4-4 m
		SYS_SAMPLE_CODE	8565821-03821-03	8565822-03821-04	8565823-03821-05	8565824-03821-06	8565827-03821-09	8565830-03821-12	8565831-03822-01	8565835-03822-05	8565862-03822-10	8565877-03822-11	8565900-03822-12	8582689-03823-01	8582692-03823-04	8582704-03823-12	8582706-03824-02
		PARENT_SAMPLE_CODE				8565823-03821-05											
		SAMPLE_TYPE_CODE	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N
		FIELD_SDG	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N238668	17N240971	17N240971	17N240971	17N240971
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		-	28	< 20	-	77	< 20	47	< 20	46	46	-	< 20	26	123	27
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	-	< 10	< 10	< 10	< 10	< 10
VPH + LEPH	mg/kg		10	38	30	10	87	30	57	30	56	46	10	30	36	133	37
Maximum Allowable Soil Concentration	1.91E+02																

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit	Location	K19-TP17-64-SA3	K19-TP17-64-SA4	K19-TP17-65-SA2	K19-TP17-65-SA2	K19-TP17-65-SA3	K19-TP17-65-SA4	K19-TP17-66-SA2	K19-TP17-66-SA3	K19-TP17-67-SA1	K19-TP17-67-SA3	K19-TP17-68-SA1	K19-TP17-68-SA3	K19-TP17-68-SA5	K19-TP17-70-SA3	K19-TP17-70-SA4
		Sample Name	03824-05	03824-06	03824-08	03824-09	03824-10	03824-11	03825-01	03825-02	03825-04	03825-07	03825-09	03825-11	03826-01	03826-10	03826-11
		Sample Date	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/18/2017
		Sample Depth	2.6-2.6 m	4.2-4.2 m	1.5-1.5 m	1.5-1.5 m	2.6-2.6 m	4.1-4.1 m	1.6-1.6 m	2.5-2.5 m	0.5-0.5 m	2.5-2.5 m	0.6-0.6 m	2.5-2.5 m	4.1-4.1 m	2.4-2.4 m	3.5-3.5 m
		SYS_SAMPLE_CODE	8582711-03824-05	8582712-03824-06	8582723-03824-08	8582729-03824-09	8582730-03824-10	8582741-03824-11	8582754-03825-01	8582762-03825-02	8582764-03825-04	8582768-03825-07	8582770-03825-09	8582774-03825-11	8582776-03826-01	8582789-03826-10	8582791-03826-11
		PARENT_SAMPLE_CODE				8582723-03824-08											
		SAMPLE_TYPE_CODE	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N
		FIELD_SDG	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		20	-	< 20	< 20	-	50	< 20	-	-	< 20	< 20	456	76	-	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		-	14	-	-	< 10	-	-	< 10	< 10	< 10	< 10	16	< 10	< 10	< 10
VPH + LEPH	mg/kg		20	14	20	20	10	50	20	10	10	30	30	472	86	10	10
Maximum Allowable Soil Concentration	1.91E+02																

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil -
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit	Location	K19-TP17-70-SA5	K19-TP17-71-SA1	K19-TP17-71-SA3	K19-TP17-71-SA3	K19-TP17-72-SA3	K19-TP17-73-SA2	K19-TP17-74-SA2	K19-TP17-74-SA2	K19-TP17-75-SA1	K19-TP17-75-SA4	K19-TP17-76-SA1	K19-TP17-76-SA2	K19-TP17-76-SA4	K19-TP17-77-SA1	K19-TP17-77-SA2
		Sample Name	03826-12	03827-01	03827-03	03827-04	03827-08	03827-11	03828-02	03828-03	03828-06	03828-09	03828-10	03828-11	03829-02	03829-03	03829-04
		Sample Date	7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/19/2017	7/19/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/20/2017
		Sample Depth	4.9-4.9 m	0.5-0.5 m	2.5-2.5 m	2.5-2.5 m	2.4-2.4 m	1.4-1.4 m	1.6-1.6 m	1.6-1.6 m	0.6-0.6 m	3-3 m	0.7-0.7 m	1.7-1.7 m	3.2-3.2 m	0.6-0.6 m	1.7-1.7 m
		SYS_SAMPLE_CODE	8582794-03826-12	8582795-03827-01	8582809-03827-03	8582811-03827-04	8582829-03827-08	8582833-03827-11	8590249-03828-02	8590250-03828-03	8590253-03828-06	8590256-03828-09	8590257-03828-10	8590258-03828-11	8590275-03829-02	8590288-03829-03	8590289-03829-04
		PARENT_SAMPLE_CODE				8582809-03827-03				8590249-03828-02							
		SAMPLE_TYPE_CODE	N	N	N	FD	N	N	N	FD	N	N	N	N	N	N	N
		FIELD_SDG	17N240971	17N240971	17N240971	17N240971	17N240971	17N240971	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		121	-	< 20	< 20	48	126	< 20	-	< 20	-	-	< 20	55	-	< 20
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	14	< 10	-	16	< 10	-
VPH + LEPH	mg/kg		131	10	30	30	58	136	30	10	30	14	10	20	71	10	20
Maximum Allowable Soil Concentration	1.91E+02																

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil -
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	K19-TP17-77-SA4	K19-TP17-78-SA1	K19-TP17-78-SA4	K19-TP17-79-SA4	K19-TP17-80-SA2	K19-TP17-80-SA3	K19-TP17-80-SA4	K19-TP17-80-SA5	K19-TP17-81-SA1	K19-TP17-81-SA3	K19-TP17-82-SA2	K19-TP17-82-SA2	K19-TP17-82-SA3	K19-TP17-82-SA4	K19-TP17-83-SA2
Sample Name	03829-06	03829-07	03829-10	03840-03	03840-05	03840-06	03840-07	03840-08	03840-09	03840-11	03841-02	03841-03	03841-04	03841-05	03841-07
Sample Date	7/20/2017	7/20/2017	7/20/2017	7/20/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017	7/21/2017
Sample Depth	3.3-3.3 m	0.7-0.7 m	3.2-3.2 m	3-3 m	1.4-1.4 m	2.6-2.6 m	3.7-3.7 m	4.3-4.3 m	0.6-0.6 m	2.6-2.6 m	1.4-1.4 m	1.4-1.4 m	2.5-2.5 m	4.2-4.2 m	1.5-1.5 m
SYS_SAMPLE_CODE	8590298-03829-06	8590299-03829-07	8590309-03829-10	8590500-03840-03	8590502-03840-05	8590503-03840-06	8590505-03840-07	8590506-03840-08	8590507-03840-09	8590509-03840-11	8590523-03841-02	8590524-03841-03	8590527-03841-04	8590528-03841-05	8590530-03841-07
PARENT_SAMPLE_CODE												8590523-03841-02			
SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	N	N	FD	N	N	N
FIELD_SDG	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036
Parameter	**Unit**														
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg	38	< 20	44	76	< 20	383	25	-	< 20	< 20	304	485	< 20	-	< 20
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg	12	< 10	12	< 10	-	< 10	-	< 10	< 10	< 10	< 10	< 10	-	< 10	< 10
VPH + LEPH	mg/kg	50	30	56	86	20	393	25	10	30	30	314	495	20	10	30
Maximum Allowable Soil Concentration	1.91E+02															

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table 7: VPH + LEPH Calculation For Soil - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Unit	Location	K19-TP17-83-SA4	K19-TP17-84-SA2	K19-TP17-85-SA2	K19-TP17-85-SA3	K19-TP17-86-SA1	K19-TP17-86-SA4	K19-TP17-87-SA3	K19-TP17-87-SA5	K19-HA17-09	K19-HA17-10
		Sample Name	03841-09	03841-12	03842-04	03842-05	03842-08	03842-11	03843-02	03843-04	04263-01	04263-04
		Sample Date	7/21/2017	7/21/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	7/22/2017	10/11/2017	10/11/2017
		Sample Depth	3.9-3.9 m	1.6-1.6 m	1.5-1.5 m	2.5-2.5 m	0.7-0.7 m	4-4 m	2.8-2.8 m	4.8-4.8 m	0.05-0.46 m	1-1.5 m
		SYS_SAMPLE_CODE	8590545-03841-09	8590548-03841-12	8590569-03842-04	8590572-03842-05	8590576-03842-08	8590581-03842-11	8590588-03843-02	8590591-03843-04	8814892-04263-01	8814898-04263-04
		PARENT_SAMPLE_CODE										
		SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	N
		FIELD_SDG	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N242036	17N271535	17N271535
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	mg/kg		27	< 20	< 20	< 20	< 20	-	46	28	56	25
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	mg/kg		-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons (C6-C10)	mg/kg		-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	mg/kg		14	< 10	< 10	-	< 10	< 10	< 10	< 10	< 10	< 10
VPH + LEPH	mg/kg		41	30	30	20	30	10	56	38	66	35
Maximum Allowable Soil Concentration	1.91E+02											

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> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.

If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening soil concentrations.

Table J-8: VPH + LEPH Calculation For Groundwater and Surface Water-
K19 - Trutch Former Townsite
Alaska Highway, BC

	Location	K19 CULVERT	K19 DW WELL	K19 DW WELL	K19-09MW-03	K19-09MW-06	K19-09MW-06	K19-09MW-09	K19-10MW-24	K19-10MW10	K19-MW16-01D	K19-MW16-01D	K19-MW16-01D	K19-MW16-01D	K19-MW16-03D
	Sample Name	K19 CULVERT	DUP-SW-K19	K19 DW WELL	03816-03	03830-02	03830-03	03816-01	03816-04	03375-04	06690-06	3809-03	K19-MW16-01D	K19-MW16-01D	03375-03
	Sample Date	6/15/2016	6/15/2016	6/15/2016	7/21/2017	7/16/2017	7/16/2017	7/21/2017	7/21/2017	2/4/2017	2/8/2017	7/15/2017	3/11/2016	6/17/2016	2/4/2017
	Sample Depth														
	MATRIX_CODE	WS	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG
	SYS_SAMPLE_CODE	OV9111	OV9109	OV9110	8590128-03816-03	8582954-03830-02	8582957-03830-03	8590033-03816-01	8590131-03816-04	QN4369	QN9072	8565586-3809-03	OH3620	OW6900	QN4368
	PARENT_SAMPLE_CODE			OV9109			8582954-03830-02								
	SAMPLE_TYPE_CODE	N	N	FD	N	N	FD	N	N	N	N	N	N	N	N
	FIELD_SDG	B648667	B648667	B648667	17N242036	17N240971	17N240971	17N242036	17N242036	B709734	B710365	17N238668	B619935	B650178	B709734
Parameter	Unit														
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	ug/L	-	-	-	-	< 100	< 100	-	-	-	-	< 100	-	-	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	ug/L	< 200	< 200	< 200	-	-	-	-	-	< 200	< 200	-	< 200	< 200	< 200
Volatile Petroleum Hydrocarbons (C6-C10)	ug/L	< 300	< 300	< 300	-	-	-	-	-	< 300	< 300	-	< 300	< 300	< 300
Volatile Petroleum Hydrocarbons: BTEX,VPH, LEPH & HEPH; PAH corrected	ug/L	-	-	-	< 100	< 100	< 100	< 100	< 100	-	-	< 100	-	-	-
VPH + LEPH	ug/L	500	500	500	100	200	200	100	100	500	500	200	500	500	500
Maximum Allowable Concentration in Water	1.96E+04														

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.
If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening groundwater concentrations.

Table J-8: VPH + LEPH Calculation For Groundwater and Surface Water-
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit														
Location		K19-MW16-03D	K19-MW16-03D	K19-MW16-03D	K19-MW16-03S	K19-MW16-05	K19-MW16-05	K19-MW16-07D	K19-MW16-07D	K19-MW16-07D	K19-MW16-07D	K19-MW16-07S	K19-MW16-07S	K19-MW16-10D	K19-MW16-10D
Sample Name		3808-05	K19-MW16-03D	K19-MW16-03D	K19-MW16-03S	03816-02	K19-MW16-05	03815-03	03815-04	K19-MW16-07D	K19-MW16-07D	03797-07	K19-MW16-07S	3808-01	K19-MW16-10D
Sample Date		7/14/2017	3/15/2016	6/17/2016	6/17/2016	7/21/2017	6/18/2016	7/20/2017	7/20/2017	3/14/2016	6/18/2016	7/26/2017	6/19/2016	7/13/2017	3/15/2016
Sample Depth															
MATRIX_CODE		WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG
SYS_SAMPLE_CODE		8565752-3808-05	OH7528	OW6904	OW6905	8590124-03816-02	OW6906	8590015-03815-03	8590019-03815-04	OH7523	OW6941	8601486-03797-07	OW6942	8565629-3808-01	OH7525
PARENT_SAMPLE_CODE									8590015-03815-03						
SAMPLE_TYPE_CODE		N	N	N	N	N	N	N	FD	N	N	N	N	N	N
FIELD_SDG		17N238668	B620736	B650178	B650178	17N242036	B650178	17N242036	17N242036	B620736	B650178	17N243826	B650178	17N238668	B620736
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	ug/L	< 100	-	-	-	-	-	< 100	< 100	-	-	< 100	-	< 100	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	ug/L	-	< 200	< 200	< 200	-	< 200	-	-	< 200	< 200	-	< 200	-	< 200
Volatile Petroleum Hydrocarbons (C6-C10)	ug/L	-	< 300	< 300	< 300	-	< 300	-	-	< 300	< 300	-	< 300	-	< 300
Volatile Petroleum Hydrocarbons: BTEX,VPH, LEPH & HEPH; PAH corrected	ug/L	< 100	-	-	-	< 100	-	< 100	< 100	-	-	< 100	-	< 100	-
VPH + LEPH	ug/L	200	500	500	500	100	500	200	200	500	500	200	500	200	500
Maximum Allowable Concentration in Water	1.96E+04														

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.
If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening groundwater concentrations.

Table J-8: VPH + LEPH Calculation For Groundwater and Surface Water-
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	Unit														
Location		K19-MW16-10D	K19-MW16-10S	K19-MW16-10S	K19-MW16-10S	K19-MW16-11	K19-MW16-11	K19-MW16-12D	K19-MW16-12D	K19-MW16-12D	K19-MW16-12S	K19-MW16-12S	K19-MW16-12S	K19-MW16-13	K19-MW16-13
Sample Name		K19-MW16-10D	3808-02	K19-MW16-10S	K19-MW16-10S	K19-MW16-11	K19-MW16-11	3808-03	K19-MW16-12D	K19-MW16-12D	3808-04	K19-MW16-12S	K19-MW16-12S	K19-MW16-13	K19-MW16-13
Sample Date		6/17/2016	7/13/2017	3/18/2016	6/17/2016	3/16/2016	6/19/2016	7/13/2017	3/16/2016	6/17/2016	7/13/2017	3/18/2016	6/17/2016	3/17/2016	6/8/2016
Sample Depth															
MATRIX_CODE		WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG
SYS_SAMPLE_CODE		OW6899	8565632-3808-02	OI2306	OW6902	OI2300	OW6972	8565682-3808-03	OI2301	OW6901	8565715-3808-04	OI2307	OW6903	OI2303	OU9527
PARENT_SAMPLE_CODE															
SAMPLE_TYPE_CODE		N	N	N	N	N	N	N	N	N	N	N	N	N	N
FIELD_SDG		B650178	17N238668	B621590	B650178	B621590	B650178	17N238668	B621590	B650178	17N238668	B621590	B650178	B621590	B646703
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	ug/L	-	< 100	-	-	-	-	< 100	-	-	< 100	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	ug/L	< 200	-	< 200	< 200	< 200	< 200	-	< 200	< 200	-	< 200	< 200	< 200	< 200
Volatile Petroleum Hydrocarbons (C6-C10)	ug/L	< 300	-	< 300	< 300	< 300	< 300	-	< 300	< 300	-	< 300	< 300	< 300	< 300
Volatile Petroleum Hydrocarbons: BTEX,VPH, LEPH & HEPH; PAH corrected	ug/L	-	< 100	-	-	-	-	< 100	-	-	< 100	-	-	-	-
VPH + LEPH	ug/L	500	200	500	500	500	500	200	500	500	200	500	500	500	500
Maximum Allowable Concentration in Water	1.96E+04														

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.
If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening groundwater concentrations.

Table J-8: VPH + LEPH Calculation For Groundwater and Surface Water-
K19 - Trutch Former Townsite
Alaska Highway, BC

	Location	K19-MW16-13-DUP	K19-MW17-05	K19-MW17-05	K19-MW17-06	K19-MW17-06	K19-MW17-07	K19-MW17-07	K19-MW17-10	K19-MW17-11	K19-MW17-11	K19-MW17-12	K19-MW17-12	K19-MW17-13	K19-MW17-13
	Sample Name	K19-MW16-13-DUP	03375-07	03798-01	03815-05	06689-06	03815-02	06690-01	03765-01	03830-01	06706-02	03815-01	06690-08	03830-04	06690-04
	Sample Date	3/17/2016	2/5/2017	7/27/2017	7/20/2017	2/6/2017	7/20/2017	2/7/2017	7/25/2017	7/16/2017	2/8/2017	7/20/2017	2/9/2017	7/16/2017	2/8/2017
	Sample Depth														
	MATRIX_CODE	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG
	SYS_SAMPLE_CODE	OI2305	QN4372	8601487-03798-01	8590020-03815-05	QN4593	8590013-03815-02	QN9067	8598915-03765-01	8582939-03830-01	QN9113	8590011-03815-01	QN9074	8582959-03830-04	QN9070
	PARENT_SAMPLE_CODE	OI2303													
	SAMPLE_TYPE_CODE	FD	N	N	N	N	N	N	N	N	N	N	N	N	N
	FIELD_SDG	B621590	B709734	17N243826	17N242036	B709775	17N242036	B710365	17N243343	17N240971	B710365	17N242036	B710365	17N240971	B710365
Parameter	**Unit**														
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	ug/L	-	-	< 100	< 100	-	< 100	-	< 100	< 100	-	< 100	-	< 100	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	ug/L	< 200	< 200	-	-	< 200	-	< 200	-	-	< 200	-	< 200	-	< 200
Volatile Petroleum Hydrocarbons (C6-C10)	ug/L	< 300	< 300	-	-	< 300	-	< 300	-	-	< 300	-	< 300	-	< 300
Volatile Petroleum Hydrocarbons: BTEX,VPH, LEPH & HEPH; PAH corrected	ug/L	-	-	< 100	< 100	-	< 100	-	< 100	< 100	-	< 100	-	< 100	-
VPH + LEPH	ug/L	500	500	200	200	500	200	500	200	200	500	200	500	200	500
Maximum Allowable Concentration in Water	1.96E+04														

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.
If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening groundwater concentrations.

Table J-8: VPH + LEPH Calculation For Groundwater and Surface Water-
K19 - Trutch Former Townsite
Alaska Highway, BC

	Location	K19-MW17-13	K19-Onsite Water Src	K19A-09MW-02	K19A-09MW-02	K19A-09MW-02	K19A-09MW-02	K19A-09MW-02	K19A-09MW-03	K19A-09MW-03	K19A-09MW-04	K19A-09MW-05	K19A-09MW-05	K19A-09MW-05	K19A-09MW-06
	Sample Name	06690-05	K19-ONSITE WATER SOURCE			03830-05	06706-05	K19A-09MW-02	06706-04	K19A-09MW-03	K19A-09MW-04		K19A-09MW-05	MWA	
	Sample Date	2/8/2017	3/11/2016	11/7/2009	11/7/2009	7/16/2017	2/9/2017	6/8/2016	2/9/2017	6/9/2016	6/7/2016	11/5/2009	6/7/2016	6/7/2016	11/5/2009
	Sample Depth														
	MATRIX_CODE	WG	WS	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG
	SYS_SAMPLE_CODE	QN9071	OH3619	DUP1101	K19A-09MW-02	8582971-03830-05	QN9116	OU9528	QN9115	OU9606	OU9525	K19A-09MW-05	OU9519	OU9520	K19A-09MW-06
	PARENT_SAMPLE_CODE	QN9070		K19a-09MW-02										OU9519	
	SAMPLE_TYPE_CODE	FD	N	FD	N	N	N	N	N	N	N	N	N	FD	N
	FIELD_SDG	B710365	B619935			17N240971	B710365	B646703	B710365	B646703	B646703		B646703	B646703	
Parameter	**Unit**														
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	ug/L	-	-	-	-	< 100	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	ug/L	< 200	< 200	< 250	< 250	-	< 200	< 200	< 200	< 200	< 200	350	< 200	< 200	< 250
Volatile Petroleum Hydrocarbons (C6-C10)	ug/L	< 300	< 300	-	-	-	< 300	< 300	< 300	< 300	< 300	-	< 300	< 300	-
Volatile Petroleum Hydrocarbons: BTEX,VPH, LEPH & HEPH; PAH corrected	ug/L	-	-	-	-	< 100	-	-	-	-	-	-	-	-	-
VPH + LEPH	ug/L	500	500	250	250	200	500	500	500	500	500	350	500	500	250
Maximum Allowable Concentration in Water	1.96E+04														

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.
If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening groundwater concentrations.

Table J-8: VPH + LEPH Calculation For Groundwater and Surface Water-
K19 - Trutch Former Townsite
Alaska Highway, BC

Location		K19A-09MW-06	K19A-09MW-06	K19A-09MW-07	K19A-09MW-07	K19A-09MW-08	K19A-09MW-09	K19A-09MW-09	K19A-09MW-09	K19A-09MW-10	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03
Sample Name		06706-01	K19A-09MW-06		K19A-09MW-07	K19A-09MW-08		06706-03	K19A-09MW-09	K19A-09MW-10	06690-02	3808-06	K19A-10MW-03	K19A-10MW-03	K19A-10MW-03
Sample Date		2/8/2017	6/7/2016	11/5/2009	6/13/2016	6/13/2016	11/5/2009	2/8/2017	6/16/2016	6/16/2016	2/7/2017	7/14/2017	8/26/2010	9/12/2010	6/16/2016
Sample Depth															
MATRIX_CODE		WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG
SYS_SAMPLE_CODE		QN9112	OU9522	K19A-09MW-07	OV9102	OV9103	K19A-09MW-09	QN9114	OW6860	OW6861	QN9068	8565760-3808-06	W62838	W94460	OW6897
PARENT_SAMPLE_CODE															
SAMPLE_TYPE_CODE		N	N	N	N	N	N	N	N	N	N	N	N	N	N
FIELD_SDG		B710365	B646703		B648667	B648667		B710365	B650178	B650178	B710365	17N238668	B078852	B085207	B650178
Parameter	**Unit**														
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	ug/L	-	-	-	-	-	-	-	-	-	-	< 100	-	-	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	ug/L	< 200	< 200	< 250	< 200	< 200	< 250	< 200	< 200	< 200	< 200	-	< 80	< 80	< 200
Volatile Petroleum Hydrocarbons (C6-C10)	ug/L	< 300	< 300	-	< 300	< 300	-	< 300	< 300	< 300	< 300	-	< 300	< 300	< 300
Volatile Petroleum Hydrocarbons: BTEX,VPH, LEPH & HEPH; PAH corrected	ug/L	-	-	-	-	-	-	-	-	-	-	< 100	-	-	-
VPH + LEPH	ug/L	500	500	250	500	500	250	500	500	500	500	200	380	380	500
Maximum Allowable Concentration in Water	1.96E+04														

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.
If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening groundwater concentrations.

Table J-8: VPH + LEPH Calculation For Groundwater and Surface Water-
K19 - Trutch Former Townsite
Alaska Highway, BC

Location		K19A-10MW-03	K19A-10MW-04	K19A-10MW-04	K19A-10MW-05	K19A-10MW-05	K19A-10MW-06	K19A-10MW-07	K19A-10MW-07	K19A-10MW-09	K19A-10MW-09	K19A-10MW-21	K19A-10MW-21	K19A-10MW-21	K19A-10MW-22
Sample Name		SAMPLE E	K19A-10MW-04	K19A-10MW-04	K19A-10MW-05	K19A-10MW-05	K19A-10MW-06	K19A-10MW-07	K19A-10MW-07	K19A-10MW-09	K19A-10MW-09	06689-03	K19A-10MW-21	K19A-10MW-21	K19A-10MW22
Sample Date		6/16/2016	9/13/2010	6/15/2016	9/11/2010	6/7/2016	9/13/2010	9/11/2010	6/7/2016	9/13/2010	6/7/2016	2/5/2017	9/10/2010	6/16/2016	6/16/2016
Sample Depth													5.7-8.7 m		
MATRIX_CODE		WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG
SYS_SAMPLE_CODE		OW6898	X00787	OV9108	W94461	OU9521	X00788	W94462	OU9524	X00789	OU9523	QN4590	W94465	OW6866	OW6863
PARENT_SAMPLE_CODE		OW6897													
SAMPLE_TYPE_CODE		FD	N	N	N	N	N	N	N	N	N	N	N	N	N
FIELD_SDG		B650178	B086989	B648667	B085207	B646703	B086989	B085207	B646703	B086989	B646703	B709775	B085207	B650178	B650178
Parameter	**Unit**														
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	ug/L	< 200	370	< 200	< 80	< 200	< 80	< 80	< 200	< 80	< 200	490	89	< 200	< 200
Volatile Petroleum Hydrocarbons (C6-C10)	ug/L	< 300	< 300	< 300	< 300	< 300	< 300	< 300	< 300	< 300	< 300	< 300	< 300	< 300	< 300
Volatile Petroleum Hydrocarbons: BTEX,VPH, LEPH & HEPH; PAH corrected	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH + LEPH	ug/L	500	670	500	380	500	380	380	500	380	500	790	389	500	500
Maximum Allowable Concentration in Water	1.96E+04														

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.
If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening groundwater concentrations.

Table J-8: VPH + LEPH Calculation For Groundwater and Surface Water-
K19 - Trutch Former Townsite
Alaska Highway, BC

Location	K19A-10MW-22	K19A-10MW-24	K19A-10MW-24	K19A-10MW-24	K19A-10MW-25	K19A-10MW-25	K19A-10MW-25	K19A-10MW-27	K19A-10MW-27	K19B-09MW-01	K19B-09MW-02	K19B-09MW-02	K19B-09MW-02	K19B-09MW-03
Sample Name	K19A-10MW-22	06689-04	06689-05	K19A-10MW-24	DUP-03	K19A-10MW-25	K19A-10MW-25	K19A-10MW-27	K19A-10MW-27	K19B-09MW-01		K19B-09MW-02	MWF	
Sample Date	9/12/2010	2/6/2017	2/6/2017	9/17/2010	9/13/2010	9/13/2010	6/10/2016	9/17/2010	6/10/2016	9/9/2010	11/4/2009	6/19/2016	6/19/2016	11/4/2009
Sample Depth	6-9 m							7.95-10.95 m						
MATRIX_CODE	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG
SYS_SAMPLE_CODE	W94466	QN4591	QN4592	X20718	X00795	X00791	OV7197	X20719	OV7200	W88640	K19B-09MW-02	OW6944	OW6945	K19B-09MW-03
PARENT_SAMPLE_CODE			QN4591		X00791								OW6944	
SAMPLE_TYPE_CODE	N	N	FD	N	FD	N	N	N	N	N	N	N	FD	N
FIELD_SDG	B085207	B709775	B709775	B091490	B086989	B086989	B648291	B091490	B648291	B083804		B650178	B650178	
Parameter	**Unit**													
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	ug/L	< 80	< 200	< 200	< 80	130	< 80	< 200	< 80	< 200	< 80	< 250	< 200	< 200	< 250
Volatile Petroleum Hydrocarbons (C6-C10)	ug/L	< 300	< 300	< 300	-	< 300	< 300	< 300	-	< 300	< 300	-	< 300	< 300	-
Volatile Petroleum Hydrocarbons: BTEX,VPH, LEPH & HEPH; PAH corrected	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH + LEPH	ug/L	380	500	500	80	430	380	500	80	500	380	250	500	500	250
Maximum Allowable Concentration in Water	1.96E+04														

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.
If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening groundwater concentrations.

Table J-8: VPH + LEPH Calculation For Groundwater and Surface Water-
K19 - Trutch Former Townsite
Alaska Highway, BC

Location		K19B-09MW-03	K19B-09MW-04	K19B-09MW-04	K19B-09MW-05	K19B-09MW-06	K19B-09MW-07	K19B-09MW-07	K19B-10MW-12	K19B-10MW-12	K19B-10MW-13	K19B-10MW-13	K19B-10MW-14	K19B-10MW-14	K19B-10MW-14
Sample Name		K19B-09MW-03		K19B-09MW-04	K19B-09MW-05	K19B-09MW-06	K19B-09MW-07	K19B-09MW-07	K19B-10MW-12	K19B-10MW-12	K19B-10MW-13	K19B-10MW-13	DUP-01	K19B-10MW-14	K19B-10MW-14
Sample Date		6/19/2016	11/4/2009	6/19/2016	6/19/2016	6/19/2016	9/9/2010	6/9/2016	9/9/2010	6/19/2016	9/9/2010	6/19/2016	9/9/2010	9/9/2010	6/19/2016
Sample Depth															
MATRIX_CODE		WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG
SYS_SAMPLE_CODE		OW6948	K19B-09MW-04	OW6949	OW6943	OW6974	W88641	OU9611	W88638	OW6973	W88639	OW6947	W88643	W88635	OW6946
PARENT_SAMPLE_CODE													W88635		
SAMPLE_TYPE_CODE		N	N	N	N	N	N	N	N	N	N	N	FD	N	N
FIELD_SDG		B650178		B650178	B650178	B650178	B083804	B646703	B083804	B650178	B083804	B650178	B083804	B083804	B650178
Parameter	**Unit**														
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	ug/L	< 200	< 250	< 200	< 200	< 200	< 80	< 200	< 80	< 200	< 80	< 200	< 80	< 80	< 200
Volatile Petroleum Hydrocarbons (C6-C10)	ug/L	< 300	-	< 300	< 300	< 300	< 300	< 300	< 300	< 300	< 300	< 300	< 300	< 300	< 300
Volatile Petroleum Hydrocarbons: BTEX,VPH, LEPH & HEPH; PAH corrected	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPH + LEPH	ug/L	500	250	500	500	500	380	500	380	500	380	500	380	380	500
Maximum Allowable Concentration in Water	1.96E+04														

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.
If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening groundwater concentrations.

Table J-8: VPH + LEPH Calculation For Groundwater and Surface Water-
K19 - Trutch Former Townsite
Alaska Highway, BC

Location		K19B-10MW-15	K19B-10MW-15	K19B-10MW-15	K19B-10MW-15	K19B-10MW-16	K19B-10MW-16	K19B-10MW-18	K19B-10MW-18	K19-10MW-10	K19-10MW-10	K19-MW17-09	K19-MW17-17	K19-MW17-18	K19-MW17-19
Sample Name		03797-01	K19B-10MW-15	K19B-10MW-15	MWC	K19B-10MW-16	K19B-10MW-16	K19B-10MW-18	K19B-10MW-18	03816-05	03816-06	03765-02	03797-02	03797-03	03765-03
Sample Date		7/26/2017	9/9/2010	6/9/2016	6/9/2016	9/9/2010	6/9/2016	9/9/2010	6/9/2016	7/21/2017	7/21/2017	7/25/2017	7/26/2017	7/26/2017	7/25/2017
Sample Depth								6.6-9.6 m							
MATRIX_CODE		WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG
SYS_SAMPLE_CODE		8601479-03797-01	W88636	OU9609	OU9610	W88637	OU9612	W88642	OU9613	8590146-03816-05	8590147-03816-06	8598916-03765-02	8601480-03797-02	8601482-03797-03	8598917-03765-03
PARENT_SAMPLE_CODE					OU9609						8590146-03816-05				
SAMPLE_TYPE_CODE		N	N	N	FD	N	N	N	N	N	FD	N	N	N	N
FIELD_SDG		17N243826	B083804	B646703	B646703	B083804	B646703	B083804	B646703	17N242036	17N242036	17N243343	17N243826	17N243826	17N243343
Parameter	**Unit**														
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	ug/L	< 100	-	-	-	-	-	-	-	-	-	< 100	< 100	< 100	< 100
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	ug/L	-	< 80	< 200	< 200	< 80	< 200	< 80	< 200	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons (C6-C10)	ug/L	-	< 300	< 300	< 300	< 300	< 300	< 300	< 300	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH, LEPH & HEPH; PAH corrected	ug/L	< 100	-	-	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100	< 100
VPH + LEPH	ug/L	200	380	500	500	380	500	380	500	100	100	200	200	200	200
Maximum Allowable Concentration in Water	1.96E+04														

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.
If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening groundwater concentrations.

Table J-8: VPH + LEPH Calculation For Groundwater and Surface Water-
K19 - Trutch Former Townsite
Alaska Highway, BC

Location		K19-MW17-20	K19-MW17-21	K19-MW17-21	K19-MW17-22	K19-MW17-23	K19-MW17-24	K19-MW17-24	K19-MW17-25	K19-MW17-26	K19-MW17-27	K19-MW17-28	K19-MW17-29D	K19-MW17-29S	K19-MW17-30
Sample Name		03765-06	03765-04	03765-05	03762-04	03762-03	03797-04	03797-05	03797-06	03763-04	03798-02	03798-03	03762-07	03763-05	03762-01
Sample Date		7/25/2017	7/25/2017	7/25/2017	7/28/2017	7/28/2017	7/26/2017	7/26/2017	7/26/2017	7/30/2017	7/27/2017	7/27/2017	7/28/2017	7/30/2017	7/28/2017
Sample Depth															
MATRIX_CODE		WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG
SYS_SAMPLE_CODE		8599005-03765-06	8598918-03765-04	8598919-03765-05	8604418-03762-04	8604416-03762-03	8601483-03797-04	8601484-03797-05	8601485-03797-06	8604456-03763-04	8601488-03798-02	8601489-03798-03	8604432-03762-07	8604457-03763-05	8604383-03762-01
PARENT_SAMPLE_CODE				8598918-03765-04				8601483-03797-04							
SAMPLE_TYPE_CODE		N	N	FD	N	N	N	FD	N	N	N	N	N	N	N
FIELD_SDG		17N243343	17N243343	17N243343	17N244304	17N244304	17N243826	17N243826	17N243826	17N244304	17N243826	17N243826	17N244304	17N244304	17N244304
Parameter	**Unit**														
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	ug/L	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	630	< 100
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons (C6-C10)	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH, LEPH & HEPH; PAH corrected	ug/L	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	100	< 100
VPH + LEPH	ug/L	200	200	200	200	200	200	200	200	200	200	200	200	730	200
Maximum Allowable Concentration in Water	1.96E+04														

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.
If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening groundwater concentrations.

Table J-8: VPH + LEPH Calculation For Groundwater and Surface Water-
K19 - Trutch Former Townsite
Alaska Highway, BC

Location		K19-MW17-31	K19-MW17-32	K19-MW17-33	K19-MW17-34	K19-MW17-35D	K19-MW17-35D	K19-MW17-35S	K19-SW17-07	K19-SW17-08	K19-SW17-09	K19-SW17-10
Sample Name		03762-02	03798-04	03762-05	03762-06	03763-01	03763-02	03763-06	03844-01	03844-02	03844-03	03763-03
Sample Date		7/29/2017	7/27/2017	7/28/2017	7/28/2017	7/29/2017	7/29/2017	7/30/2017	7/23/2017	7/23/2017	7/23/2017	7/29/2017
Sample Depth												
MATRIX_CODE		WG	WG	WG	WG	WG	WG	WG	WS	WS	WS	WS
SYS_SAMPLE_CODE		8604393-03762-02	8601490-03798-04	8604425-03762-05	8604429-03762-06	8604451-03763-01	8604452-03763-02	8604470-03763-06	8598956-03844-01	8598957-03844-02	8598958-03844-03	8604454-03763-03
PARENT_SAMPLE_CODE							8604451-03763-01					
SAMPLE_TYPE_CODE		N	N	N	N	N	FD	N	N	N	N	N
FIELD_SDG		17N244304	17N243826	17N244304	17N244304	17N244304	17N244304	17N244304	17N243343	17N243343	17N243343	17N244304
Parameter	**Unit**											
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	ug/L	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	ug/L	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons (C6-C10)	ug/L	-	-	-	-	-	-	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH, LEPH & HEPH; PAH corrected	ug/L	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
VPH + LEPH	ug/L	200	200	200	200	200	200	200	200	200	200	200
Maximum Allowable Concentration in Water	1.96E+04											

< Indicates parameter was below laboratory equipment detection limit.
> Indicates parameter detected above equipment analytical range.
- Chemical not analyzed or criteria not defined.
Output generated by GalReport.
If a parameter was below detection limits, the full detection was used in calculating the sum of VPH and LEPH for the purposes of screening groundwater concentrations.

Table J-9: Results of Vapour Partitioning Calculations - Soil - Whole Site
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	CSR Vapour Standards [1] RL (µg/m³)	Notes	Location	Sample Depth (m)	Fractured Bedrock Depth (m)	Outdoor Air Attenuation Factor[2]	Maximum Soil Concentration (mg/kg)	Concentration Used in Model (mg/kg)	Henry's Law Constant [4]	Koc [4] (mL/g)	Predicted Soil Vapour Concentration* [3] (µg/m³)	Predicted Outdoor Air Concentration (µg/m³) attenuated
VPH			K19-BH17-09	2.5-2.5	1.8	1.2E-06	15	15	5.10E-01	1.60E+03	7.86E+05	0.9
LEPH			K19-BH17-09	2.5-2.5	1.8	1.2E-06	290	290	5.70E-02	2.50E+03	1.10E+06	1.3
VPH+LEPH	**1000**		K19-BH17-09									2.3
VPH			K19-BH17-09	2.5-2.5	1.8	1.2E-06	14	14	5.10E-01	1.60E+03	7.33E+05	0.9
LEPH			K19-BH17-09	2.5-2.5	1.8	1.2E-06	240	240	5.70E-02	2.50E+03	9.09E+05	1.1
VPH+LEPH	**1000**		K19-BH17-09									2.0
VPH			K19-MW17-07	3.5-3.5	2.3	9.2E-07	27	27	5.10E-01	1.60E+03	1.41E+06	1.3
LEPH			K19-MW17-07	3.5-3.5	2.3	9.2E-07	450	450	5.70E-02	2.50E+03	1.70E+06	1.6
VPH+LEPH	**1000**		K19-MW17-07									2.9
VPH			K19-TP16-13	2.2-2.2	0.8	1.0E-04	24	24	5.10E-01	1.60E+03	1.26E+06	1.26E+02
LEPH			K19-TP16-13	2.2-2.2	0.8	1.0E-04	580	580	5.70E-02	2.50E+03	2.20E+06	2.20E+02
VPH+LEPH	**1000**		K19-TP16-13									3.45E+02
VPH			K19-TP17-13	1.6-1.6	0.9	1.0E-04	-	-	5.10E-01	1.60E+03	-	-
LEPH			K19-TP17-13	1.6-1.6	0.9	1.0E-04	650	650	5.70E-02	2.50E+03	2.46E+06	2.46E+02
VPH+LEPH	**1000**		K19-TP17-13									2.46E+02
VPH			K19-TP17-13	3.4-3.4	0.9	1.0E-04	<10	10	5.10E-01	1.60E+03	5.24E+05	<52
LEPH			K19-TP17-13	3.4-3.4	0.9	1.0E-04	380	380	5.70E-02	2.50E+03	1.44E+06	1.44E+02
VPH+LEPH	**1000**		K19-TP17-13									1.96E+02
VPH			K19-TP17-15	3.5-3.5	0.8	1.0E-04	14	14	5.10E-01	1.60E+03	7.33E+05	73.3
LEPH			K19-TP17-15	3.5-3.5	0.8	1.0E-04	740	740	5.70E-02	2.50E+03	2.80E+06	2.80E+02
VPH+LEPH	**1000**		K19-TP17-15									3.54E+02
VPH			K19-TP17-15	4.9-4.9	0.8	1.0E-04	21	21	5.10E-01	1.60E+03	1.10E+06	1.10E+02
LEPH			K19-TP17-15	4.9-4.9	0.8	1.0E-04	180	180	5.70E-02	2.50E+03	6.82E+05	6.82E+01
VPH+LEPH	**1000**		K19-TP17-15									1.78E+02
VPH			K19-TP17-23	3.2-3.2	0.8	1.0E-04	26	26	5.10E-01	1.60E+03	1.36E+06	1.36E+02
LEPH			K19-TP17-23	3.2-3.2	0.8	1.0E-04	1300	1300	5.70E-02	2.50E+03	4.93E+06	4.93E+02
VPH+LEPH	**1000**		K19-TP17-23									6.29E+02
VPH			K19-TP17-24	2.5-2.5	0.7	1.0E-04	<10	10	5.10E-01	1.60E+03	5.24E+05	<52
LEPH			K19-TP17-24	2.5-2.5	0.7	1.0E-04	260	260	5.70E-02	2.50E+03	9.85E+05	99
VPH+LEPH	**1000**		K19-TP17-24									99
VPH			K19-TP17-27	3.5-3.5	0.4	1.0E-04	<10	10	5.10E-01	1.60E+03	5.24E+05	<52
LEPH			K19-TP17-27	3.5-3.5	0.4	1.0E-04	190	190	5.70E-02	2.50E+03	7.20E+05	72
VPH+LEPH	**1000**		K19-TP17-27									124
VPH			K19-TP17-27	4.6-4.6	0.4	1.0E-04	<10	10	5.10E-01	1.60E+03	5.24E+05	<52
LEPH			K19-TP17-27	4.6-4.6	0.4	1.0E-04	280	280	5.70E-02	2.50E+03	1.06E+06	106
VPH+LEPH	**1000**		K19-TP17-27									158
VPH			K19-TP17-28	4.3-4.3	0.4	1.0E-04	<10	10	5.10E-01	1.60E+03	5.24E+05	<52
LEPH			K19-TP17-28	4.3-4.3	0.4	1.0E-04	320	320	5.70E-02	2.50E+03	1.21E+06	1.21E+02
VPH+LEPH	**1000**		K19-TP17-28									1.74E+02
VPH			K19-TP17-30	3.2-3.2	0.3	1.0E-04	10	10	5.10E-01	1.60E+03	5.24E+05	52.4
LEPH			K19-TP17-30	3.2-3.2	0.3	1.0E-04	510	510	5.70E-02	2.50E+03	1.93E+06	1.93E+02
VPH+LEPH	**1000**		K19-TP17-30									2.46E+02
VPH			K19-TP17-39	1.5-1.5 m	1.4	1.5E-06	<10	10	5.10E-01	1.60E+03	5.24E+05	<0.79
LEPH			K19-TP17-39	1.5-1.5 m	1.4	1.5E-06	340	340	5.70E-02	2.50E+03	1.29E+06	1.9
VPH+LEPH	**1000**		K19-TP17-39									2.7
VPH			K19-TP17-49	2.4-2.4 m	0.7	1.0E-04	<10	10	5.10E-01	1.60E+03	5.24E+05	<52
LEPH			K19-TP17-49	2.4-2.4 m	0.7	1.0E-04	430	430	5.70E-02	2.50E+03	1.63E+06	1.63E+02
VPH+LEPH	**1000**		K19-TP17-49									2.15E+02
VPH			K19A-09MW-02	0.6-1.2	-	1.0E-04	<100	100	5.10E-01	1.60E+03	5.24E+06	<524
LEPH			K19A-09MW-02	0.6-1.2	-	1.0E-04	<250	250	5.70E-02	2.50E+03	9.47E+05	<94.7
VPH+LEPH	**1000**		K19A-09MW-02									<619
VPH			K19A-09MW-03	0-0.6	-	1.0E-04	<100	100	5.10E-01	1.60E+03	5.24E+06	<524
LEPH			K19A-09MW-03	0-0.6	-	1.0E-04	<250	250	5.70E-02	2.50E+03	9.47E+05	<95
VPH+LEPH	**1000**		K19A-09MW-03									<619
VPH			K19A-09MW-03	4.3-4.9	-	6.1E-07	<100	100	5.10E-01	1.60E+03	5.24E+06	<3.2
LEPH			K19A-09MW-03	4.3-4.9	-	6.1E-07	<100	100	5.70E-02	2.50E+03	3.79E+05	<0.23
VPH+LEPH	**1000**		K19A-09MW-03									<3.4
VPH			K19A-09MW-04	1.8-2.4	-	1.2E-06	<100	100	5.10E-01	1.60E+03	5.24E+06	<6.3
LEPH			K19A-09MW-04	1.8-2.4	-	1.2E-06	<250	250	5.70E-02	2.50E+03	9.47E+05	<1.14
VPH+LEPH	**1000**		K19A-09MW-04									<7.4
VPH			K19A-09MW-04	1.8-2.4	-	1.2E-06	<100	100	5.10E-01	1.60E+03	5.24E+06	<6.3
LEPH			K19A-09MW-04	1.8-2.4	-	1.2E-06	<250	250	5.70E-02	2.50E+03	9.47E+05	<1.14
VPH+LEPH	**1000**		K19A-09MW-04									<7.4
VPH			K19A-09MW-04	6.7-7.9	-	3.7E-07	<100	100	5.10E-01	1.60E+03	5.24E+06	<1.9
LEPH			K19A-09MW-04	6.7-7.9	-	3.7E-07	<250	250	5.70E-02	2.50E+03	9.47E+05	<0.35
VPH+LEPH	**1000**		K19A-09MW-04									<2.3
Benzene	**1.5**		K19A-09MW-04	1.8-2.4	-	1.2E-06	<0.04	0.04	2.27E-01	5.90E+01	2.10E+04	<0.025
Benzene	**1.5**		K19A-09MW-04	6.7-7.9	-	3.7E-07	<0.04	0.04	2.27E-01	5.90E+01	2.10E+04	<0.008
VPH			K19A-09MW-05	0-0.6	-	1.0E-04	<100	100	5.10E-01	1.60E+03	5.24E+06	<524
LEPH			K19A-09MW-05	0-0.6	-	1.0E-04	<250	250	5.70E-02	2.50E+03	9.47E+05	<95
VPH+LEPH	**1000**		K19A-09MW-05									<619
VPH			K19A-09MW-05	0-0.6	-	1.0E-04	<100	100	5.10E-01	1.60E+03	5.24E+06	<524
LEPH			K19A-09MW-05	0-0.6	-	1.0E-04	<250	250	5.70E-02	2.50E+03	9.47E+05	<95
VPH+LEPH	**1000**		K19A-09MW-05									<619
VPH			K19A-09MW-05	1.8-2.4	-	1.2E-06	<100	100	5.10E-01	1.60E+03	5.24E+06	<6.3
LEPH			K19A-09MW-05	1.8-2.4	-	1.2E-06	<250	250	5.70E-02	2.50E+03	9.47E+05	<1.14
VPH+LEPH	**1000**		K19A-09MW-05									<7.4
VPH			K19A-09MW-05	6.4-7	-	3.7E-07	<100	100	5.10E-01	1.60E+03	5.24E+06	<1.9
LEPH			K19A-09MW-05	6.4-7	-	3.7E-07	<250	250	5.70E-02	2.50E+03	9.47E+05	<0.35
VPH+LEPH	**1000**		K19A-09MW-05									<2.3
benzene	**1.5**		K19A--09MW-05	0-0.6	-	1.0E-04	<0.04	0.04	2.27E-01	5.90E+01	2.10E+04	**<2.01**
benzene	**1.5**		K19A--09MW-05	1.8-2.4	-	1.2E-06	<0.04	0.04	2.27E-01	5.90E+01	2.10E+04	<0.025
VPH			K19A-09MW-06	6.7-7.3	-	3.7E-07	<100	100	5.10E-01	1.60E+03	5.24E+06	<1.94
LEPH			K19A-09MW-06	6.7-7.3	-	3.7E-07	-	-	5.70E-02	2.50E+03	-	-
VPH+LEPH	**1000**		K19A-09MW-06									<2
benzene	**1.5**		K19A-09MW-06	6.7-7.3 m	-	3.7E-07	<0.04	0.04	2.27E-01	5.90E+01	2.10E+04	<0.008
VPH			K19A-10MW-04	3.8-4	-	6.1E-07	20	20	5.10E-01	1.60E+03	1.05E+06	0.6
LEPH			K19A-10MW-04	3.8-4	-	6.1E-07	314	314	5.70E-02	2.50E+03	1.19E+06	0.7
VPH+LEPH	**1000**		K19A-10MW-04									1.4
VPH			K19A-10MW-22	1.2-1.5	-	1.5E-06	-	-	5.10E-01	1.60E+03	-	-
LEPH			K19A-10MW-22	1.2-1.5	-	1.5E-06	659	659	5.70E-02	2.50E+03	2.50E+06	3.7
VPH+LEPH	**1000**		K19A-10MW-22									3.7
1,2-Dibromoethane	**0.5**		K19A-10MW-22	1.2-1.5	-	1.5E-06	<0.072	0.072	2.73E-02	4.40E+01	6.48E+03	<0.01
VPH			K19A-10MW-24	3.05-3.35	-	6.1E-07	-	-	5.10E-01	1.60E+03	-	-
LEPH			K19A-10MW-24	3.05-3.35	-	6.1E-07	1190	1190	5.70E-02	2.50E+03	4.51E+06	2.8
VPH+LEPH	**1000**		K19A-10MW-24									2.8
VPH			K19A-10MW-24	3.05-3.35	-	6.1E-07	-	-	5.10E-01	1.60E+03	-	-
LEPH			K19A-10MW-24	3.05-3.35	-	6.1E-07	431	431	5.70E-02	2.50E+03	1.63E+06	1.0
VPH+LEPH	**1000**		K19A-10MW-24									1.0

Table J-9: Results of Vapour Partitioning Calculations - Soil - Whole Site
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	CSR Vapour Standards [1] RL (µg/m³)	Notes	Location	Sample Depth (m)	Fractured Bedrock Depth (m)	Outdoor Air Attenuation Factor[2]	Maximum Soil Concentration (mg/kg)	Concentration Used in Model (mg/kg)	Henry's Law Constant [4]	Koc [4] (mL/g)	Predicted Soil Vapour Concentration* [3] (µg/m³)	Predicted Outdoor Air Concentration (µg/m³) attenuated
VPH			K19-HD17-04	0.4-0.4 m	-	1.0E-04	-	-	5.10E-01	1.60E+03	-	-
LEPH			K19-HD17-04	0.4-0.4 m	-	1.0E-04	460	460	5.70E-02	2.50E+03	1.74E+06	1.74E+02
VPH+LEPH	**1000**		K19-HD17-04									1.74E+02
VPH			K19-MW17-17	5.2-5.8	1.2	1.5E-06	28	28	5.10E-01	1.60E+03	1.47E+06	2.2
LEPH			K19-MW17-17	5.2-5.8	1.2	1.5E-06	365	365	5.70E-02	2.50E+03	1.38E+06	2.1
VPH+LEPH	**1000**		K19-MW17-17									4.3
VPH			K19-MW17-17	6.5-7	1.2	1.5E-06	-	-	5.10E-01	1.60E+03	-	-
LEPH			K19-MW17-17	6.5-7	1.2	1.5E-06	292	292	5.70E-02	2.50E+03	1.11E+06	1.7
VPH+LEPH	**1000**		K19-MW17-17									1.7
VPH			K19-MW17-18	7.5-8.5	1.5	1.2E-06	21	21	5.10E-01	1.60E+03	1.10E+06	1.3
LEPH			K19-MW17-18	7.5-8.5	1.5	1.2E-06	398	398	5.70E-02	2.50E+03	1.51E+06	1.8
VPH+LEPH	**1000**		K19-MW17-18									3.1
VPH			K19-MW17-18	41609	1.5	1.2E-06	22	22	5.10E-01	1.60E+03	1.15E+06	1.4
LEPH			K19-MW17-18	41609	1.5	1.2E-06	262	262	5.70E-02	2.50E+03	9.93E+05	1.2
VPH+LEPH	**1000**		K19-MW17-18									2.6
VPH			K19-MW17-22	9-10	2	9.2E-07	82	82	5.10E-01	1.60E+03	4.30E+06	4.0
LEPH			K19-MW17-22	9-10	2	9.2E-07	141	141	5.70E-02	2.50E+03	5.34E+05	0.5
VPH+LEPH	**1000**		K19-MW17-22									4.4
VPH			K19-MW17-28	5-5.5	1.3	1.5E-06	<10	10	5.10E-01	1.60E+03	5.24E+05	<0.79
LEPH			K19-MW17-28	5-5.5	1.3	1.5E-06	216	216	5.70E-02	2.50E+03	8.18E+05	1.2
VPH+LEPH	**1000**		K19-MW17-28									2.0
VPH			K19-MW17-28	8-8.5	1.3	1.5E-06	<10	10	5.10E-01	1.60E+03	5.24E+05	<0.79
LEPH			K19-MW17-28	8-8.5	1.3	1.5E-06	244	244	5.70E-02	2.50E+03	9.24E+05	1.4
VPH+LEPH	**1000**		K19-MW17-28									2.2
VPH			K19-MW17-29	2.5-2.8	1.5	1.2E-06	<10	10	5.10E-01	1.60E+03	5.24E+05	<0.6
LEPH			K19-MW17-29	2.5-2.8	1.5	1.2E-06	857	857	5.70E-02	2.50E+03	3.25E+06	3.9
VPH+LEPH	**1000**		K19-MW17-29									4.5
VPH			K19-MW17-29	3.4-3.7	1.5	1.2E-06	30	30	5.10E-01	1.60E+03	1.57E+06	1.9
LEPH			K19-MW17-29	3.4-3.7	1.5	1.2E-06	483	483	5.70E-02	2.50E+03	1.83E+06	2.2
VPH+LEPH	**1000**		K19-MW17-29									4.1
VPH			K19-MW17-29	3.4-3.7	1.5	1.2E-06	46	46	5.10E-01	1.60E+03	2.41E+06	2.9
LEPH			K19-MW17-29	3.4-3.7	1.5	1.2E-06	572	572	5.70E-02	2.50E+03	2.17E+06	2.6
VPH+LEPH	**1000**		K19-MW17-29									5.5
VPH			K19-MW17-32	3.5-4	0.9	1.0E-04	<10	10	5.10E-01	1.60E+03	5.24E+05	<52
LEPH			K19-MW17-32	3.5-4	0.9	1.0E-04	221	221	5.70E-02	2.50E+03	8.37E+05	83.7
VPH+LEPH	**1000**		K19-MW17-32									1.36E+02
VPH			K19-MW17-35	1-1.5	1.5	1.5E-06	19	19	5.10E-01	1.60E+03	9.95E+05	1.5
LEPH			K19-MW17-35	1-1.5	1.5	1.5E-06	372	372	5.70E-02	2.50E+03	1.41E+06	2.1
VPH+LEPH	**1000**		K19-MW17-35									3.6
VPH			K19-MW17-35	1-1.5	1.5	1.5E-06	17	17	5.10E-01	1.60E+03	8.91E+05	1.3
LEPH			K19-MW17-35	1-1.5	1.5	1.5E-06	307	307	5.70E-02	2.50E+03	1.16E+06	1.7
VPH+LEPH	**1000**		K19-MW17-35									3.1
VPH			K19-TP17-80	2.6-2.6	0.9	1.0E-04	<10	10	5.10E-01	1.60E+03	5.24E+05	<52
LEPH			K19-TP17-80	2.6-2.6	0.9	1.0E-04	383	383	5.70E-02	2.50E+03	1.45E+06	1.45E+02
VPH+LEPH	**1000**		K19-TP17-80									1.97E+02
VPH			K19-MW17-05	2.6-2.6	1.2	1.5E-06	13	13	5.10E-01	1.60E+03	6.81E+05	1.0
LEPH			K19-MW17-05	2.6-2.6	1.2	1.5E-06	710	710	5.70E-02	2.50E+03	2.69E+06	4.0
VPH+LEPH	**1000**		K19-MW17-05									5.1
VPH			K19-TP17-68	2.6-2.6	1	1.5E-06	13	13	5.10E-01	1.60E+03	6.81E+05	1.0
LEPH			K19-TP17-68	2.6-2.6	1	1.5E-06	710	710	5.70E-02	2.50E+03	2.69E+06	4.0
VPH+LEPH	**1000**		K19-TP17-68									5.1
VPH			K19-TP17-82	1.4-1.4	1	1.5E-06	<10	10	5.10E-01	1.60E+03	5.24E+05	<1
LEPH			K19-TP17-82	1.4-1.4	1	1.5E-06	304	304	5.70E-02	2.50E+03	1.15E+06	1.7
VPH+LEPH	**1000**		K19-TP17-82									2.5
VPH			K19-TP17-82	1.4-1.4	1	1.5E-06	<10	10	5.10E-01	1.60E+03	5.24E+05	<1
LEPH			K19-TP17-82	1.4-1.4	1	1.5E-06	485	485	5.70E-02	2.50E+03	1.84E+06	2.8
VPH+LEPH	**1000**		K19-TP17-82									3.5
benzene	**1.5**		K19B-09MW-01	3-3.7 m	-	6.1E-07	<0.04	0.04	2.27E-01	5.90E+01	2.10E+04	<0.013

Notes:

1 - Vapour standards are from the British Columbia Contaminated Sites Regulation (CSR; B.C. Reg. 375/96) Schedule 3.3 of Omnibus; includes amendments up to B.C. Reg. 253/2016, October 27, 2016 and BC Reg. 196/2017, updated to 1 November 2017.

2 - Applied attenuation factors (α) obtained from Table 1 of BC Ministry of Environment Protocol #22 - Application of Vapour Attenuation Factors to Characterize Vapour Contamination (Effective November 1, 2017).

3 - Soil vapour concentrations were calculated using the formula provided in Exhibit 2 of Health Canada (2010) Federal Contaminated Site Risk Assessment in Canada Part VII: Guidance for Soil Vapour Intrusion Assessment at Contaminated Sites.

4 - Henry's Law constant and K_{oc} values obtained from CSR Protocol 13, Table A-1 unless indicated otherwise.

* Predicted soil vapour concentrations (without attenuation) are shown for reference only and are not compared to the vapour standards.

** The sum of soil vapour partitioning calculations from LEPH and VPH concentrations in soil is used to estimate the VPHv concentration in soil vapou

It was assumed that Csoil is less than Csoil,sat for all parameters.

The input parameters used are specific to coarse soil. For the purposes of modelling, it was assumed that the material consists of coarse soil

LEPH - light extractable petroleum hydrocarbons

VPH - volatile petroleum hydrocarbons

VPHv - volatile petroleum hydrocarbons in vapour

CSR - contaminated sites regulation

RL - Residential Land Use

Soil Partitioning Formula

$C_{v,i} = UCF_2 * C_{soil,i} * H' * \rho_b / (\theta_w + K_{oc} * f_{oc} * \rho_b + H' * \theta_a)$

Key to Symbols	Default Value	Units
θ_w = water filled porosity	0.054	Unitless
θ_a = air filled porosity	0.321	Unitless
ρ_b = dry bulk density	1.6	kg/L
UCF_2 = unit conversion factor	1000	L/m^3
$C_{v,i}$ = soil vapour concentration	na	mg/m^3
f_{oc} = fraction of organic carbon	0.006	
H' = Henry's Law Constant	na	Unitless
$C_{soil,i}$ = soil concentration	na	mg/kg
K_{oc} = organic carbon-water partitioning coefficient	na	mL/g

Table J-10: Results of Vapour Partitioning Calculations - Soil - K19-MW16-07
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameter	CSR Vapour Standards [1] RL (µg/m3)	Notes	Location	Depth (m)	Indoor Air Attenuation Factor[2]	Maximum Soil Concentration (mg/kg)	Concentration Used in Model (mg/kg)	Henry's Law Constant [4]	Koc [4] (mL/g)	Notes	Predicted Soil Vapour Concentration* [3] (µg/m^3)	Predicted Outdoor Air Concentration (µg/m^3) attenuated
Acetone	**2000**		K19-MW16-07	0.8-1.1	1.0E-01	-	-	1.62E-03	5.80E-01		-	**-**
Bromodichloromethane	**40**		K19-MW16-07	0.8-1.1	1.0E-01	< 0.050	0.05	8.67E-02	5.50E+01		1.14E+04	**< 1.1E+03**
Chlorobenzene	**10**		K19-MW16-07	0.8-1.1	1.0E-01	< 0.025	0.025	1.27E-01	2.20E+02		2.30E+03	**< 2.3E+02**
Chloroform	**100**		K19-MW16-07	0.8-1.1	1.0E-01	< 0.050	0.05	1.50E-01	4.00E+01		2.47E+04	**< 2.5E+03**
Dichloromethane	**600**		K19-MW16-07	0.8-1.1	1.0E-01	< 0.10	0.1	1.33E-01	2.75E+01	5,6	5.90E+04	**< 5.9E+03**
1,2-Dibromoethane	**0.5**		K19-MW16-07	0.8-1.1	1.0E-01	< 0.025	0.025	2.73E-02	4.40E+01		2.25E+03	**< 2.3E+02**
1,1-Dichloroethane	**500**		K19-MW16-07	0.8-1.1	1.0E-01	< 0.025	0.025	2.30E-01	3.20E+01		2.11E+04	**< 2.1E+03**
1,2-Dichloroethane	**7**		K19-MW16-07	0.8-1.1	1.0E-01	< 0.025	0.025	4.82E-02	1.70E+01		8.29E+03	**< 8.3E+02**
1,2-Dichloropropane	**4**		K19-MW16-07	0.8-1.1	1.0E-01	< 0.025	0.025	1.15E-01	4.40E+01		8.96E+03	**< 9.0E+02**
trans-1,3-Dichloropropylene	**2.5**		K19-MW16-07	0.8-1.1	1.0E-01	< 0.050	0.05	1.45E-01	4.60E+01		2.14E+04	**< 2.1E+03**
1,1,2,2-Tetrachloroethane	**40**		K19-MW16-07	0.8-1.1	1.0E-01	< 0.025	0.025	1.50E-02	9.30E+01		6.31E+02	**< 6.3E+01**
1,1,2-Trichloroethane	**0.5**		K19-MW16-07	0.8-1.1	1.0E-01	< 0.025	0.025	3.37E-02	5.00E+01		2.47E+03	**< 2.5E+02**
Trichloroethylene	**2**		K19-MW16-07	0.8-1.1	1.0E-01	< 0.0090	0.009	4.03E-01	1.00E+02	5	5.08E+03	**< 5.1E+02**
benzene	**1.5**		K19-MW16-07	0.8-1.1	1.0E-01	< 0.0050	0.005	2.27E-01	5.9E+01		2.62E+03	**< 2.6E+02**
Toluene	**5000**		K19-MW16-07	0.8-1.1	1.0E-01	< 0.020	0.02	2.71E-01	1.8E+02		4.64E+03	**< 4.6E+02**
Ethylbeneze	**1000**		K19-MW16-07	0.8-1.1	1.0E-01	< 0.010	0.01	3.22E-01	3.6E+02		1.43E+03	**< 1.4E+02**
Xylene	**100**		K19-MW16-07	0.8-1.1	1.0E-01	< 0.040	0.04	2.71E-01	4.1E+02		4.25E+03	**< 4.3E+02**
Naphthalene	**3**		K19-MW16-07	0.8-1.1	1.0E-01	< 0.050	0.05	1.80E-02	1.2E+03		1.24E+02	**< 1.2E+01**
Styrene	**1000**		K19-MW16-07	0.8-1.1	1.0E-01	< 0.030	0.03	1.12E-01	7.80E+02		7.09E+02	**< 7.1E+01**
1,2,4-Trichlorobenzene	**7**		K19-MW16-07	0.8-1.1	1.0E-01	< 0.025	0.025	5.81E-02	1.80E+03		1.34E+02	**< 1.3E+01**
VPH			K19-MW16-07	0.8-1.1	1.0E-01	<10	10	5.10E-01	1.60E+03		5.24E+05	< 5.2E+04
LEPH			K19-MW16-07	0.8-1.1	1.0E-01	<100	100	5.70E-02	2.50E+03		3.79E+05	< 3.8E+04
VPH+LEPH	**1000**		K19-MW16-07	0.8-1.1	1.0E-01							**<9.0E+04**

Notes:

1 - Vapour standards are from the British Columbia Contaminated Sites Regulation (CSR; B.C. Reg. 375/96) Schedule 3.3 of Omnibus; includes amendments up to B.C. Reg. 253/2016, October 27, 2016 and BC Reg. 196/2017, updated to 1 November 2017.

2 - Applied attenuation factors (α) obtained from Table 1 of BC Ministry of Environment Protocol #22 - Application of Vapour Attenuation Factors to Characterize Vapour Contamination (Effective November 1, 2017).

3 - Soil vapour concentrations were calculated using the formula provided in Exhibit 2 of Health Canada (2010) Federal Contaminated Site Risk Assessment in Canada Part VII: Guidance for Soil Vapour Intrusion Assessment at Contaminated Sites.

4 - Henry's Law constant and K_{oc} values obtained from CSR Protocol 13, Table A-1 unless indicated otherwise. If not available in CSR Protocol 13, the US EPA RAIS database K_{oc} values were selected in order of (experimental, MCI (molecular connectivity index), estimated) and source order (EPI, SSL).

5 - Koc value obtained from the US EPA RAIS database. Values were selected in order of (experimental, MCI (molecular connectivity index), estimated) and source order (EPI, SSL).

6 - Henry's Law constant value obtained from the US EPA RAIS database. Values were selected in order of (experimental, MCI (molecular connectivity index), estimated) and source order (EPI, SSL).

** The sum of soil vapour partitioning calculations from LEPH and VPH concentrations in soil is used to estimate the VPHv concentration in soil vapour.
It was assumed that Csoil is less than Csoil,sat for all parameters.
The input parameters used are specific to coarse soil. For the purposes of modelling, it was assumed that the material consists of coarse soil.
EPI - The EPI (Estimation Programs Interface) SuiteTM is a Windows-based suite of physical/chemical property and environmental fate estimation programs
SLI - Soil Screening Guidance: User's Guide. EPA Document Number: EPA540/R-96/018. July 1996. Attachment C: Chemical Properties for SSL Development.
LEPH - light extractable petroleum hydrocarbons
VPH - volatile petroleum hydrocarbons
VPHv - volatile petroleum hydrocarbons in vapour
CSR - contaminated sites regulation
RL - Residential Land Use

Soil Partitioning Formula

$C_{v,i} = UCF_2 * C_{soil,i} * H' * \rho_b / (\theta_w + K_{oc} * f_{oc} * \rho_b + H' * \theta_a)$

Key to Symbols	Default Value	Units
θ_w = water filled porosity	0.054	Unitless
θ_a = air filled porosity	0.321	Unitless
ρ_b = dry bulk density	1.6	kg/L
UCF_2 = unit conversion factor	1000	L/m^3
$C_{v,i}$ = soil vapour concentration	na	mg/m^3
f_{oc} = fraction of organic carbon	0.006	
H' = Henry's Law Constant	na	Unitless
$C_{soil,i}$ = soil concentration	na	mg/kg
K_{oc} = organic carbon-water partitioning coefficient	na	mL/g

Table J-11: Groundwater Standards Based on Soil Vapour Standards For Neighbouring Dwellings - K19 - Trutch Former Townsite Alaska Highway, BC

Parameters	CSR Vapour Standards [1] RL ($\mu g/m^3$)	Notes	Indoor Air Attenuation Factor[2]	Maximum Allowable Concentration in Water (mg/L)	Henry's Law Constant [4]
Acetone	**2000**		1.0E-01	**1.23E+01**	1.62E-03
Chloroform	**100**		1.0E-01	**6.67E-03**	1.50E-01
1,2-Dichloroethane	**7**		1.0E-01	**3.04E-04**	2.30E-01
1,2-Dichloropropane	**4**		1.0E-01	**3.48E-04**	1.15E-01
Naphthalene	**3**		1.0E-01	**1.67E-03**	1.80E-02
MTBE	**3000**		1.0E-01	**1.25E+00**	2.40E-02
VPH+LEPH**	**1000**		1.0E-01	**1.96E-02**	5.10E-01
Ethylbenzene	**1000**		1.0E-01	**3.11E-02**	3.22E-01
Benzene	**1.5**		1.0E-01	**6.61E-05**	2.27E-01
Toluene	**5000**		1.0E-01	**1.85E-01**	2.71E-01
Xylenes	**100**		1.0E-01	**3.69E-03**	2.71E-01
Styrene	**1000**		1.0E-01	**8.93E-02**	1.12E-01

Notes:

1 - Vapour standards are from the British Columbia Contaminated Sites Regulation (CSR; B.C. Reg. 375/96) Schedule 3.3 of Omnibus; includes amendments up to B.C. Reg. 253/2016, October 27, 2016 and BC Reg. 196/2017, updated to 1 November 2017.

2 - Applied attenuation factors (α) obtained from Table 1 of BC Ministry of Environment Protocol #22 - Application of Vapour Attenuation Factors to Characterize Vapour Contamination (Effective November 1, 2017). For preliminary assessment, sample depth is assumed to be <1.0 m.

3 - Groundwater concentrations for the vapour pathway were calculated using the formula provided in Exhibit 2 of Health Canada (2010) Federal Contaminated Site Risk Assessment in Canada Part VII: Guidance for Soil Vapour Intrusion Assessment at Contaminated Sites.

4 - Henry's Law constant obtained from CSR Protocol 13, Table A-1 unless indicated otherwise.

It is assumed that the groundwater is less than the molar fraction solubility

** The sum of soil vapour partitioning calculations from LEPH and VPH concentrations in groundwater is used to estimate VPHv in soil vapour.

LEPH - light extractable petroleum hydrocarbons

VPH - volatile petroleum hydrocarbons

VPHv - volatile petroleum hydrocarbons in vapour

RL - Residential Land Use

Groundwater Partitioning Formula

$$Cv = UCF_2 * Cw * H'$$

Where:
Cw = concentration in groundwater (mg/L) and is based on Site-specific data
H' = dimensionless Henry's Law Constant (unitless) for the compound modeled
UCF_2 = unit conversion factor (L/m^3) of 1000
Cv = concentration in soil vapour (mg/m^3)

Table J-12: Residential Dwelling Groundwater Screening - K19 - Trutch Former Townsite Alaska Highway, BC

Parameter	Maximum Allowable Concentration in Water	Unit						
Location			K19-MW16-07D	K19-MW16-07D	K19-MW16-07D	K19-MW16-07D	K19-MW16-07S	K19-MW16-07S
Sample Name			03815-03	03815-04	K19-MW16-07D	K19-MW16-07D	03797-07	K19-MW16-07S
Sample Date			7/20/2017	7/20/2017	3/14/2016	6/18/2016	7/26/2017	6/19/2016
SYS_SAMPLE_CODE			8590015-03815-	8590019-03815-	OH7523	OW6941	8601486-03797-	OW6942
PARENT_SAMPLE_CODE				8590015-03815-				
SAMPLE_TYPE_CODE			N	FD	N	N	N	N
FIELD_SDG			17N242036	17N242036	B620736	B650178	17N243826	B650178
PAH								
Naphthalene	**1.67E+00**	µg/L	< 0.05	< 0.05	< 0.10	< 0.10	< 0.05	< 0.10
Light Extractable Petroleum Hydrocarbons (C10-C19) Less PAHs	**1.96E+01**	µg/L	-	-	**< 200**	**< 200**	-	**< 200**
Volatile Petroleum Hydrocarbons: BTEX, VPH, LEPH & HEPH;		µg/L			-	-		-
PAH Corrected	**1.96E+01**		**< 100**	**< 100**			**< 100**	
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	**1.96E+01**	µg/L	**< 100**	**< 100**	-	-	**< 100**	-
Volatile Petroleum Hydrocarbons (C6-C10)	**1.96E+01**	µg/L	-	-	**< 300**	**< 300**	-	**< 300**
VOC								
Chloroform	6.67E+00	µg/L	-	-	< 1.0	< 1.0	-	< 1.0
1,2-dichloroethane	**3.04E-01**	µg/L	-	-	**< 0.50**	**< 0.50**	-	**< 0.50**
1,2-dichloropropane (Propylene Dichloride)	**3.48E-01**	µg/L	-	-	**< 0.50**	**< 0.50**	-	**< 0.50**
Benzene	**6.61E-02**	µg/L	**< 0.5**	**< 0.5**	**< 0.40**	**< 0.40**	**< 0.5**	**< 0.40**
Ethylbenzene	3.11E+01	µg/L	< 0.5	< 0.5	< 0.40	< 0.40	< 0.5	< 0.40
Toluene	1.85E+02	µg/L	< 0.5	< 0.5	< 0.40	< 0.40	< 0.5	< 0.40
Xylenes, Total	**3.69E+00**	µg/L	< 1	< 1	< 0.40	< 0.40	< 1	< 0.40
Methyl tert-Butyl Ether	1.25E+03	µg/L	< 1	< 1	< 4.0	< 4.0	< 1	< 4.0
Styrene	8.93E+01	µg/L	< 0.5	< 0.5	< 0.50	< 0.50	< 0.5	< 0.50
Acetone	1.23E+04	ug/L	-	-	-	-	-	-

ALASKA HWY NOV 2017 CUSTOM - GW

< Indicates parameter was below laboratory equipment detection limit.

> Indicates parameter detected above equipment analytical range.

- Chemical not analyzed or criteria not defined.

Output generated by GalReport.

Table J-13: Residential Dwelling Soil Vapour Modelling - Groundwater Data - MW16-07D/S
K19 - Trutch Former Townsite
Alaska Highway, BC

Parameters	CSR Vapour Standards RL [1]	Notes	Location	Indoor Air Attenuation Factor [2]	Maximum Concentration (mg/L)	Concentration Used in Model (mg/L)	Henry's Law Constant [4]	Predicted Vapour Concentration* [3] (µg/m^3)	Predicted Outdoor Air Concentration (µg/m^3)
VPH			K19-MW16-07D	1.0E-01	<0.3	0.3	5.10E-01	1.53E+05	< 1.53E+04
LEPH			K19-MW16-07D	1.0E-01	<0.2	0.2	5.70E-02	1.14E+04	< 1.14E+03
VPH + LEPH	**1000**		K19-MW16-07D						**<1.64E+04**
VPH			K19-MW16-07S	1.0E-01	<0.3	0.3	5.10E-01	1.53E+05	< 1.53E-01
LEPH			K19-MW16-07S	1.0E-01	<0.2	0.2	5.70E-02	1.14E+04	< 1.14E-02
VPH + LEPH	**1000**		K19-MW16-07S						**<1.64E+04**

Notes:

1 - Vapour standards are from the British Columbia Contaminated Sites Regulation (CSR; B.C. Reg. 375/96) Schedule 3.3 of Omnibus; includes amendments up to B.C. Reg. 253/2016, October 27, 2016 and BC Reg. 196/2017, updated to 1 November 2017.

2 - Applied attenuation factors (α) obtained from Table 1 of BC Ministry of Environment Protocol #22 - Application of Vapour Attenuation Factors to Characterize Vapour Contamination (Effective November 1, 2017). For preliminary assessment, sample depth is assumed to be <1.0 m.

3 - Groundwater concentrations for the vapour pathway were calculated using the formula provided in Exhibit 2 of Health Canada (2010) Federal Contaminated Site Risk Assessment in Canada Part VII: Guidance for Soil Vapour Intrusion Assessment at Contaminated Sites.

4 - Henry's Law constant obtained from CSR Protocol 13, Table A-1 unless indicated otherwise.

It is assumed that the groundwater is less than the molar fraction solubility

* Predicted soil vapour concentrations (without attenuation) are shown for reference only and are not compared to the vapour standards.

** The sum of soil vapour partitioning calculations from LEPH and VPH concentrations in groundwater is used to estimateVPHv in soil vapour.

LEPH - light extractable petroleum hydrocarbons

VPH - volatile petroleum hydrocarbons

VPHv - volatile petroleum hydrocarbons in vapour

CSR - contaminated sites regulation

RL - Residential Land Use

Groundwater Partitioning Formula

$$Cv = UCF_2 * Cw * H'$$

Where:

Cw = concentration in groundwater (mg/L) and is based on Site-specific data

H' = dimensionless Henry's Law Constant (unitless) for the compound modeled

$UCF2$ = unit conversion factor (L/m^3) of 1000

Cv = concentration in soil vapour (mg/m^3)

K19-SW17-09 sampled approximately 150m downstream

ALASKA HWY (FORMER ALIGNMENT)

WETLAND A

WETLAND B

WETLAND C

WETLAND D

APEC 1a

APEC 1b

APEC 1c

APEC 1d

APEC 2

APEC 3a

APEC 3b

APEC 4

APEC 5

APEC 6

APEC 7a

APEC 7b

APEC 8

APEC 9

APEC 10a

APEC 10b

APEC 11

APEC 12

APEC 13

APEC 14

APEC 15

APEC 16

APEC 17

APEC 18

APEC 19

APEC 20

APEC 21

APEC 22a

APEC 22b

APEC 23

APEC 24

APEC 25

APEC 26

APEC 27

K19 DW Well

K19-SS19S01

K19-HA17-07

K19-HA17-08

K19-HA17-10

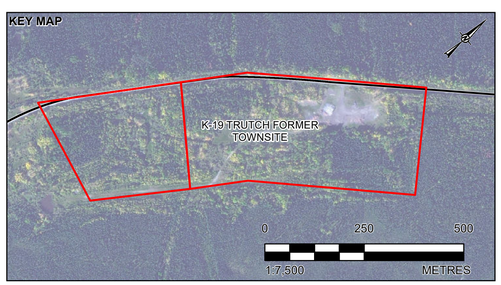
K19-MW16-07S

K19-MW16-07D

LEGEND

- SURFACE SAMPLE
- DW WELL
- BOREHOLE
- MONITORING WELL
- TEST PIT
- SEDIMENT SAMPLE
- HAND DUG SURFACE SOIL SAMPLE
- HAND
- SURFACE WATER
- WOODEN CULVERT
- MODELLED SOIL VAPOUR CONCENTRATIONS BASED ON SOIL AND/OR GROUNDWATER CHEMISTRY INDICATE SOIL VAPOUR AT THIS LOCATION COULD POTENTIALLY EXCEED APPLICABLE CSR STAGE 10 STANDARDS FOR RESIDENTIAL LAND USE
- SOIL VAPOUR CONCENTRATION MODELLED USING SOIL CHEMISTRY DATA
- SOIL VAPOUR CONCENTRATIONS MODELLED USING GROUNDWATER CHEMISTRY DATA
- SOIL VAPOUR CONCENTRATIONS MODELLED USING BOTH GROUNDWATER AND SOIL CHEMISTRY DATA
- SOIL VAPOUR CONCENTRATIONS NOT MODELLED FROM SOIL AND/OR GROUNDWATER CHEMISTRY DATA
- CONTOUR (10m)
- SECONDARY ROAD
- APPROXIMATE SEASONAL SWALE / DRAINAGE DITCH
- WATERCOURSE
- INFERRED UNDERGROUND WATERCOURSE
- INFERRED GROUNDWATER FLOW DIRECTION
- APPROXIMATE WETLAND
- ALASKA HIGHWAY FORMER ALIGNMENT
- APPROXIMATE LOCATION OF AREA OF POTENTIAL ENVIRONMENTAL CONCERN DEFINED BY GOLDER IN
- APPROXIMATE LOCATION OF AREA OF POTENTIAL ENVIRONMENTAL CONCERN DEFINED BY GOLDER IN
- APPROXIMATE LOCATION OF HISTORICAL BUILDINGS
- SITE LOCATION
- REVISED AEC BOUNDARY BASED ON ESTIMATED EXTENT OF PETROLEUM HYDROCARBON CONTAMINATION
- WOOD DEBRIS PILE

KEY MAP



0 50 100

1:1,250 METRES

DRAFT

REFERENCES

1. APEC, MONITORING WELLS, TESTPITS AND CONTOURS OBTAINED FROM ARCADIS.
2. IMAGERY OBTAINED FROM BING MAPS FOR ARCGIS PUBLISHED BY MICROSOFT CORPORATION, REDMOND, WA, MAY 2009.
3. WATERCOURSES OBTAINED BY B.C. MINISTRY OF FORESTS, LAND AND NATURAL RESOURCE OPERATIONS.
4. CONTOURS DERIVED FROM CANVEC, MODIFIED BY GOLDER ASSOCIATES LTD.
5. PROJECTION: UTM ZONE 10N DATUM: WGS84

NOTES

1. M = METRES
2. APEC SHOWN FOR ILLUSTRATIVE PURPOSES.

CLIENT
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-12-13
DESIGNED	EOB
PREPARED	RC / CD
REVIEWED	
APPROVED	

PROJECT
K-19 TRUTCH FORMER TOWNSITE
ALASKA HIGHWAY, B.C.

TITLE
SOIL VAPOUR MODELLING RESULTS

PROJECT NO.	CONTROL	REV.	FIGURE
1657709	5000	0	J-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

0 25mm

PATH: \\golder.gds\gal\burnaby\CAD-GIS\Client\PWGSC\Alaska Highway\09_PROJECTS\1657709\02_PRODUCTION\5000\MXD\Report\K19\Stage_10_Report\1657709_5000_K19_Figure_J1_Soil_Vapour_Modelling_Results.mxd PRINTED ON: 2017-12-15 AT: 10:48:01 AM

APPENDIX K

Quality Assurance/Quality Control Methods and Results

1.0 QUALITY ASSURANCE AND QUALITY CONTROL PROGRAM METHODS

The review of data quality includes data obtained during soil, groundwater, surface water and sediment sampling and analysis for the field investigation conducted at the Site. The following section includes a description of quality control methods used during the work and a detailed report of the results of the Quality Assurance and Quality Control (QA/QC) program.

1.1 Golder Quality Assurance Program

To assess and document that the sampling and analytical data were interpretable, meaningful and reproducible, conformance to a Golder quality assurance and quality control (QA/QC) program was followed.

The quality assurance (QA) measures used in the collection, preservation and shipment of samples included the following management controls:

1) Sampling methods were consistent with established Golder protocols, industry standards and provincial/federal requirements.

2) Field notes were recorded during all stages of the investigation.

3) Decontamination of sampling equipment using multiple rinses of Liquinox soap and distilled water between sampling events.

4) Chain-of-Custody procedures were used for the shipment of samples to the laboratories; samples included in a shipment were identified on a Golder Chain-of-Custody form, with one copy retained by Golder personnel, after sign-off.

5) Groundwater samples were stored in coolers and chilled with ice or ice packs, during transport and prior to submission to the analytical laboratory.

The quality control (QC) measures established for the field program included the following technical aspects:

- Submission of field duplicate samples (i.e., paired sample analyses). A field duplicate sample is a second sample of a certain media (e.g., soil or water) from the same location that is submitted to the analytical laboratory under a separate label such that the laboratory has no prior knowledge that it is a duplicate;
- The relative percent difference (RPD) between paired sample results was used to assess duplicate sample data. The RPD is a measure of the variability between two outcomes from the same procedure or process and is calculated by:

$$RPD\ (\%) = \frac{(X_1 - X_2)}{average(X_1, X_2)} x100$$

where X_1 is the original sample result, and X_2 is the paired analysis result; and

- Where the concentration of a given parameter is less than five times the method reporting limit (MRL), the laboratory results are considered to be less precise, and the RPD is not calculated. For parameters with concentrations less than five times the MRL, but still above the MRL, the difference factor (DF) between paired analyses results is calculated by:

$$DF = \frac{(X_1 - X_2)}{MRL}$$

where X_1 is the original sample result, and X_2 is the paired analysis result.

In 2015, the BC Ministry of Environment updated the British Columbia Laboratory Manual which contains recommended Data Quality Objectives (DQOs) for laboratories duplicate RPDs. It is recognized that these DQOs are intended for laboratory duplicates and do not include provisions for additional variability in field duplicates. However, these DQOs are considered a conservative screen for assessing the quality of field duplicates.

The DQOs applied to this investigation are as follows:

- For parameters in soil except PAHs, a RPD of less than 35%.
- For PAH parameters in soil, a RPD of less than 50%.
- For parameters in groundwater and surface water a RPD of less than 20%.
- For parameters with concentrations less than five times the MRL, the difference factor should be less than two (2).

Where the DQO was exceeded, further examination was conducted on a case-by-case basis.

1.2 Laboratory Quality Assurance Program

In addition to the field control procedures, the laboratories selected to conduct the analyses was based, in large part, on it having achieved proficiency certification by the Canadian Association for Laboratory Accreditation (CALA) for the analyses conducted. AGAT Laboratories (AGAT) performed the chemical analysis of soil, sediment, surface water and groundwater samples collected at the Site from 13 to 30 July, 2017. AGAT is certified by CALA for the analytical methods used for this program. The analytical laboratory also incorporated and reported the results of internal checks to Golder. These were used to assess the reliability, accuracy and reproducibility of the data. Reports from the laboratory were reviewed internally prior to submission to Golder. If internal QA/QC problems were encountered, the field samples and internal QA/QC samples were re-analyzed. Data quality issues identified by the laboratory were communicated to Golder at the time of data delivery.

Copies of the analytical reports and the corresponding Chain-of-Custody forms are presented in Appendix F.

2.0 QUALITY ASSURANCE AND QUALITY CONTROL PROGRAM RESULTS

Golder QA/QC Program – Alaska Highway Project

Soil

A total of 211 soil samples were submitted for laboratory analysis during the July 2017 sampling program at the Alaska Highway Project of Site K-19. The soil field QA/QC program consisted of field duplicate soil samples for the analysis of the following parameters (sample collected, and number of duplicate pairs): LEPH/ HEPH/PAH (170, 13); BTEX/ VPH (123, 13); VOCs (60, 5); metals (82, 9); and glycol (9, 1). The QA/QC results for all duplicate pairs that did not meet the DQOs for RPD and DF are listed below.

- Sample pair 03824-08 and 03824-09, had RPD values greater than 35% for barium, cadmium, lead, lithium, manganese, silver, strontium and zirconium and a DF value of 2 for beryllium. This does not affect the quality of the data as both samples had barium, beryllium, cadmium, lead, lithium, manganese, silver, strontium and zirconium concentrations below the most conservative standard.
- Sample pair 03813-07 and 03817-08, had RPD values greater than 35% for aluminum, arsenic, cadmium, calcium, cobalt, copper, magnesium, manganese, molybdenum, potassium, titanium and zirconium. Aluminum, arsenic, cadmium, calcium, cobalt, copper, magnesium, manganese, molybdenum, potassium, titanium and zirconium were below the most conservative CSR standard. Therefore, it is concluded that the overall data quality meets the acceptability criteria.
- Sample pair 03831-07 and 03831-08, had an RPD value greater than 35% for cadmium. Sample ID 3831-07 had concentrations of cadmium greater than the most conservative standard while 3831-08 had concentrations of cadmium below the most conservative CSR standard. This is likely due to the heterogeneity of soil and thus the overall quality of data meets the acceptability criteria.
- Sample pair 03837-09 and 03837-10, had an RPD value greater than 35% for sodium and chloride. Both samples were below the most conservative CSR standard for sodium and chloride. Therefore, it is concluded that the overall data quality meets the acceptability criteria.
- Sample pair 03811-05 and 03811-06, had an RPD value greater than 35% for sodium and chloride. This does not affect the quality of the data as both samples had chloride concentrations exceeding the CSR standard. Sodium was below the most conservative CSR standard for sodium in both samples. Therefore, it is concluded that the overall data quality meets the acceptability criteria.
- Sample pair 03847-02 and 03847-03, had RPD values greater than 35% for aluminum, arsenic, calcium, copper, iron, magnesium, manganese, nickel, potassium, selenium, titanium and zinc. Aluminum, arsenic, calcium, copper, iron, magnesium, manganese, nickel, potassium, selenium, titanium and zinc were below CSR standards in both samples and thus the quality of the data is not affected.
- Sample pair 03833-05 and 03833-06, had RPD values greater than 50% for extractable petroleum hydrocarbons (EPH), HEPH, volatile hydrocarbon (VH) and VPH. EPH, HEPH, VH and VPH were below CSR standards in both samples and thus the quality of the data is not affected.

- Sample pair 03841-02 and 03841-03, had RPD values greater than 35% for 1-Methylnaphthalene. 1-Methylnaphthalene had concentrations below CSR standards in both samples and thus the quality of the data is not affected.
- Sample pair 03839-09 and 03839-10, had RPD values greater than 35% for total xylene, m,p-Xylenes and o-Xylene. Ethylbenzene had a DF greater than 2. This does not affect the quality of the data as both samples had ethylbenzene, total xylene, m,p-Xylenes and o-Xylene concentrations below the most conservative CSR standard.
- Sample pair 03833-05 and 03833-06, had RPD values greater than 35% for 1-Methylnaphthalene. 1-Methylnaphthalene had concentrations below CSR standards in both samples and thus the quality of the data is not affected.
- Sample pair 03838-07 and 03838-08, had RPD values greater than 35% for total xylene and m,p-Xylenes. This does not affect the quality of the data as both samples had total xylene and m,p-Xylenes concentrations below the most conservative CSR standard.

The results of the soil QA/QC analyses are provided in Tables K-2, K-3, K-4 and K-5.

Groundwater

A total of 56 groundwater samples were submitted for laboratory analysis during the July 2017 sampling program at the Alaska Highway Project of Site K-19, including six duplicate pairs analyzed for the following parameters: dissolved metals, chloride ion, salinity, LEPH/HEPH, PAH. 56 samples and six duplicate pairs were analyzed for petroleum hydrocarbons. 56 samples including six duplicates were analysed for metals, and 39 samples including six duplicates were analysed for VOCs. Ten samples were analysed for chloride including five duplicates. Eleven groundwater samples were analysed for glycols but no duplicates were collected during this field program. The QA/QC results for all duplicate pairs that did not meet the DQOs for RPD and DF are listed below:

- Sample pair 03830-02 and 03830-03 from location K19-09MW-06 had a RPD of 33% for arsenic. This does not affect the quality of the data as both samples had concentrations below the most conservative CSR standard for arsenic.
- Sample pair 03816-05 and 03816-06 from location K19-10MW-10 had a RPD of 33% for arsenic. This does not affect the quality of the data as both samples had concentrations below the most conservative CSR standard for arsenic.
- Sample pair 03797-04 and 03797-05 from location K19-MW17-24had a RPD of 25% for molybdenum. This does not affect the quality of the data as both samples had concentrations below the most conservative CSR standard for molybdenum.

The results of the groundwater QA/QC analyses are provided in Tables K-7, K-8 and K-9.

Surface Water

A total of 11 surface water samples were submitted for laboratory analysis during the July 2017 sampling program at the Alaska Highway Project of Site K-19, including one duplicate pair analyzed for the following parameters: total and dissolved metals, chloride ion, salinity, BTEX/VPH, LEPH/HEPH, PAH, glycols, and VOCs. The QA/QC results for all duplicate pairs that did not meet the DQOs for RPD and DF are listed below:

- Sample pair 03814-05 and 03814-06 from location K19-SW17-05 had RPDs greater than 20% for the following dissolved metal parameters: arsenic (80%), barium (35%), and titanium (42%). This does not affect the quality of the data as both samples had concentrations below the most conservative guidelines for dissolved arsenic, barium and titanium.
- Sample pair 03814-05 and 03814-06 had an RPD of 37% was observed for total copper and a DF of 2 for total mercury. Total copper had concentrations below the guidelines in both samples and thus the quality of the data is not affected.
- Sample pair 3814-05 had a concentration of total mercury above the BCWQG FW 30 Day standard and the CCME guideline, while sample pair 3814-06 had a concentration of total mercury below the BCWQG FW 30 Day guideline and the CCME guideline. Several other surface water samples also had exceedances to the BCWQG FW 30 Day and the CCME guidelines for total mercury, therefore this sample pair was considered to exceed the applicable total mercury guidelines. This sample pair and all others surface water samples met the applicable dissolved mercury standards.

The results of the surface water QA/QC analyses are provided in Tables K-10, K-11, K-12 and K-13.

Sediment

A total of 9 sediment samples were submitted for laboratory analysis during the July 2017 sampling program at the Alaska Highway Project of Site K-19, including one duplicate pair analyzed for the following parameters: metals, sodium and chloride (saturated paste), LEPH/HEPH, PAH, BTEX/VPH and VOCs. The QA/QC results for all duplicate pairs that did not meet the DQOs for RPD and DF are listed below:

- Sample pair 03813-05 and 03813-06, had RPD values greater than 35% for total organic carbon, chloride, cobalt and manganese. This does not affect the quality of the data as none of these parameters have applicable standards or guidelines.

The results of the sediment QA/QC analyses are provided in Tables K-14, K-15 and K-16.

Laboratory QA/QC Program

All samples were analyzed within the recommended hold times.

In general, each sample analysis batch included at least one method blank (MB), one matrix spike (MS), one laboratory duplicate (dup) and one reference or control sample (RCS). The results of the internal laboratory QA testing are provided in the laboratory reports included in Appendix I.

Additional identified laboratory data quality issues are presented in Table K-1.

Soil

A review of the AGAT soil report identified no soil QA/QC issues at K-19.

Groundwater

A review of the AGAT groundwater report identified no groundwater QA/QC issues at K-19.

Surface Water

A review of the AGAT surface water report identified no surface water QA/QC issues at K-19.

Sediment

A review of the AGAT sediment report identified no sediment QA/QC issues at K-19.

3.0 CONCLUSION OF QA/QC ANALYSIS

Based on a review of the QA/QC program, the data recovered during the field investigation are considered reproducible and suitable for the assessment of soil, groundwater, surface water and sediment at the Site.

Tables (Attached)

Table K-1: Summary of Quality Control Sample Results
Table K-2: Results of Soil Quality Control Analyses - Metals and Inorganic Parameters
Table K-3: Results of Soil Quality Control Analyses - Hydrocarbons and PAHs
Table K-4: Results of Soil Quality Control Analyses - Volatile Organic Compounds
Table K-5: Results of Soil Quality Control Analyses - Glycols
Table K-6: Results of Soil Quality Control Analyses - Leachates
Table K-7: Results of Groundwater QA/QC – Dissolved Metals
Table K-8: Results of Groundwater QA/QC – Hydrocarbons and PAHs
Table K-9: Results of Groundwater QA/QC - Volatile Organic Compounds
Table K-10: Results of Surface Water Quality Control Analyses - Metals and Inorganic Parameters
Table K-11: Results of Surface Water Quality Control Analyses - Hydrocarbons and PAHs
Table K-12: Results of Surface Water Quality Control Analyses - Volatile Organic Compounds
Table K-13: Results of Surface Water Quality Control Analyses – Glycols
Table K-14: Results of Sediment Quality Control Analyses - Metals and Inorganic Parameters
Table K-15: Results of Sediment Quality Control Analyses - Hydrocarbons and PAHs
Table K-16: Results of Sediment Quality Control Analyses - Volatile Organic Compounds

Table K-1
Summary of Quality Control Sample Results
K19 - Trutch Former Townsite
Alaska Highway, BC

Laboratory Submission Number	COC	Sample Matrix	Laboratory QQC Notes	Laboratory Sample ID Affected	Data Quality Issue
17N238668	3796, 3820, 3821, 3822, 3776	Soil	Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions; Soil sample is visibly heterogeneous.	8565794-8565911	No
			Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions; Soil sample is visibly heterogeneous; PAH detection limits increased. Sample extract was diluted.	8565912	
			Results are based on dry weight of sample; VPH results have been corrected for BTEX contributions.	8565804-8565915	
			VPH results have been corrected for BTEX contributions.	8565623-8565752	
			Results are based on the dry weight of the soil.	8565824	
			Results are based on dry weight of sample.	8565765-8565779	
			Results are based on dry weight of sample.	8565794-8565911	
	3809, 3608	Groundwater	Identification based on retention time relative to standards.		
			LEPH & HEPH results have been corrected for PAH contributions.	8565536-8565715	
17N240971	3823, 3824, 3825, 3826, 3827, 3811, 3832, SE - COC3 3813	Soil	Results are based on the dry weight of the sample	8582701-8583007	No
			Due to the insufficient sample volume, less than the recommended sample volume was used for analysis of saturated paste.	8582868	
			Due to the insufficient sample volume, less than the recommended sample volume was used for analysis of saturated paste.	8582885	
			Due to the insufficient sample volume, less than the recommended sample volume was used for analysis of saturated paste.	8582893	
			Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions.	8582885	
			Results are based on dry weight of sample. LEPH & HEPH results have been corrected for PAH contributions. EPH & PAH detection limits increased due to high sample moisture content.	8582890-8582896	
			Results are based on dry weight of sample. LEPH & HEPH results have been corrected for PAH contributions.	8582902	
			Results are based on dry weight of sample. LEPH & HEPH results have been corrected for PAH contributions.	8582689-8582998	
			Results are based on dry weight of sample. LEPH & HEPH results have been corrected for PAH contributions. PAH detection limits increased due to sample matrix interference. Sample extract was diluted	8582999-8583001	
			Results are based on dry weight of sample. LEPH & HEPH results have been corrected for PAH contributions.	8583004-8583011	
			Results are based on dry weight of sample. LEPH & HEPH results have been corrected for PAH contributions. PAH detection limits increased due to sample matrix interference. Sample extract was diluted	8583016	
			Results are based on dry weight of sample; VPH results have been corrected for BTEX contributions.	8582692-8583016	
			VPH results have been corrected for BTEX contributions.	8582921-8582971	
			Results are based on dry weight of sample; VOC/VPH detection limits increased due to high sample moisture content.	8582893-8582896	
	3830, 3814	Groundwater & surface water	Due to matrix interferences sample was diluted for Anions analysis, detection limits have been adjusted accordingly	8582954-8582971	
			Due to matrix interferences sample was diluted for metals analysis, detection limits have been adjusted accordingly.	8582954-8582957	
17N242036	3828, 3829, 3833, 3834, 3835, 3840, 3841, 3842, 3843	Soil	Due to the insufficient sample volume, less than the recommended sample volume was used for analysis of saturated paste.	8590359-8590436	No
			Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions; Soil sample is visibly heterogeneous.	8590249-8590368	
			Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions; Soil sample is visibly heterogeneous; PAH detection limits increased due to sample matrix interference. Sample extract was diluted	8590370	
			Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions; Soil sample is visibly heterogeneous.	8590372	
			Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions; Soil sample is visibly heterogeneous; PAH detection limits increased due to sample matrix interference. Sample extract was diluted	8590381-8590423	
			Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions; Soil sample is visibly heterogeneous.	8590427	
			Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions; Soil sample is visibly heterogeneous; PAH detection limits increased due to sample matrix interference. Sample extract was diluted	8590432-8590483	
			Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions; Soil sample is visibly heterogeneous.	8590485-8590591	
	3815, 3816	Groundwater	None		
17N243343	3836, 3837, 3838, 3845	Soil	Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions; Soil sample is visibly heterogeneous; PAH detection limits increased due to sample matrix interference. Sample extract was diluted. PAH detection limits increased due to sample dilution.	8598923-8598939	No
			Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions; Soil sample is visibly heterogeneous.	8598944-8598950	
			Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions; Soil sample is visibly heterogeneous; PAH detection limits increased due to sample dilution.	8598951	
			Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions; Soil sample is visibly heterogeneous.	8598953-8598962	
	3765, 3844	Groundwater	Some total metal results are less than the dissolved metal results; results are within the precision of the method	8598956	
			Some total metal results are less than the dissolved metal results; results are within the precision of the method	8598958	
17N243826	3839, 3846, 3847	Soil	Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions; PAH detection limits increased due to sample dilution.	8601360-8601377	No
			Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions.	8601386	
			Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions; PAH detection limits increased due to sample dilution.	8601394-8601399	
			Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions.	8601404-8601416	
			Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions; PAH detection limits increased due to sample dilution.	8601417	
			Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions; PAH detection limits increased due to sample dilution.	8601422	
			Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions.	8601425-8601427	
			Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions; PAH detection limits increased due to sample dilution.	8601431-8601470	
			Results are based on dry weight of sample; LEPH & HEPH results have been corrected for PAH contributions.	8601472-8601477	
	3797, 3798	Groundwater	Due to matrix interferences sample was diluted for Chloride analysis, detection limits have been adjusted accordingly.	8601487	
			Due to matrix interferences sample was diluted for metals analysis, detection limits have been adjusted accordingly.	8601479-8601480	
			Due to matrix interferences sample was diluted for metals analysis, detection limits have been adjusted accordingly.	8601487	

No data quality issues were identified in the AGAT laboratory reports for soil, sediment, groundwater and surface water

Table K-2
Results of Soil Quality Control Analyses - Metals and Inorganic Parameters
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-TP17-52-SA1	K19-TP17-52-SA1	RDL	RPD (%)	DF (unitless)	K19-TP17-65-SA2	K19-TP17-65-SA2	RDL	RPD (%)	DF (unitless)	K19-MW17-18-SA1	K19-MW17-18-SA1	RDL	RPD (%)	DF (unitless)
Sample Name	03796-06	03796-07				03824-08	03824-09				03813-07	03813-08			
Sample Collection Date	7/14/2017	7/14/2017				7/17/2017	7/17/2017				7/18/2017	7/18/2017			
Sample Depth	0.8 - 0.8 m	0.8 - 0.8 m				1.5 - 1.5 m	1.5 - 1.5 m				0.3 - 0.5 m	0.3 - 0.5 m			
Sodium/Chloride by Sat. Paste															
Chloride	-	-	-	-	-	-	-	-	-	-	-	< 2	-	-	-
Sodium (mg/L)	-	-	-	-	-	-	-	-	-	-	-	< 2	-	-	-
Metals															
pH	6.23	6.14	0.05	1	n/c	5.54	5.63	0.05	2	n/c	5.24	5.62	0.05	7	n/c
Aluminum	26700	29300	10	9	n/c	10200	9980	10	2	n/c	7400	15200	10	**69**	n/c
Antimony	0.4	0.4	0.1	n/c	0	0.3	0.2	0.1	n/c	1	0.5	0.6	0.1	18	n/c
Arsenic	11	11.1	0.1	1	n/c	< 0.1	< 0.1	0.1	n/c	0	4.9	8.4	0.1	**53**	n/c
Barium	689	811	0.5	16	n/c	304	205	0.5	**39**	n/c	423	341	0.5	**21**	n/c
Beryllium	1.5	1.8	0.1	18	n/c	0.5	0.3	0.1	n/c	**2**	0.6	0.8	0.1	**29**	n/c
Bismuth	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Cadmium	1.06	1.45	0.01	31	n/c	0.18	0.11	0.01	**48**	n/c	0.69	0.22	0.01	**103**	n/c
Calcium	8040	8010	10	0	n/c	2030	2010	10	1	n/c	2420	3750	10	**43**	n/c
Chromium	35	39	1	11	n/c	< 1	< 1	1	n/c	0	19	24	1	**23**	n/c
Cobalt	8.5	8.9	0.1	5	n/c	0.1	< 0.1	0.1	n/c	0	5.5	9.8	0.1	**56**	n/c
Copper	29.1	32.8	0.2	12	n/c	< 0.2	< 0.2	0.2	n/c	0	20.4	25	0.2	**20**	n/c
Iron	32000	33300	10	4	n/c	35700	39200	10	9	n/c	25800	28700	10	11	n/c
Lead	18.4	19.4	0.1	5	n/c	8.3	5.1	0.1	**48**	n/c	13	12.1	0.1	7	n/c
Lithium	27.6	33	0.5	18	n/c	6.7	4.2	0.5	**46**	n/c	13.9	15.6	0.5	12	n/c
Magnesium	3750	3670	10	2	n/c	2420	2370	10	2	n/c	1930	4160	10	**73**	n/c
Manganese	223	204	1	9	n/c	621	395	1	**44**	n/c	105	251	1	**82**	n/c
Mercury	0.06	0.07	0.01	15	n/c	0.02	0.02	0.01	n/c	0	0.04	0.04	0.01	n/c	0
Molybdenum	1.8	1.8	0.2	0	n/c	0.6	0.4	0.2	n/c	1	1.1	1.7	0.2	**43**	n/c
Nickel	47.9	58.1	0.5	19	n/c	< 0.5	< 0.5	0.5	n/c	0	19.7	26.3	0.5	**29**	n/c
Phosphorus	1520	1710	5	12	n/c	5.54	5.63	0.05	2	n/c	5.24	5.62	0.05	7	n/c
Potassium	2870	2860	5	0	n/c	629	657	5	4	n/c	911	542	5	**51**	n/c
Selenium	1.5	1.8	0.1	18	n/c	1890	1910	5	1	n/c	1850	1920	5	4	n/c
Silver	0.6	0.8	0.5	n/c	0.4	0.8	0.5	0.1	**46**	n/c	1.1	0.9	0.1	**20**	n/c
Sodium	-	-	-	-	-	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Strontium	51	54	1	6	n/c	14	9	1	**43**	n/c	25	31	1	**21**	n/c
Thallium	0.4	0.4	0.1	n/c	0	< 0.1	< 0.1	0.1	n/c	0	0.2	0.2	0.1	n/c	0
Tin	0.8	0.9	0.2	n/c	0.5	0.3	0.2	0.2	n/c	0.5	0.5	0.5	0.2	n/c	0
Titanium	122	90	1	30	n/c	59	57	1	3	n/c	64	94	1	**38**	n/c
Uranium	3.9	4.9	0.2	23	n/c	0.9	0.6	0.2	n/c	1.5	1.4	1.4	0.2	0	n/c
Vanadium	75	83	1	10	n/c	< 1	< 1	1	n/c	0	36	45	1	**22**	n/c
Zinc	107	117	1	9	n/c	< 1	< 1	1	n/c	0	75	78	1	4	n/c
Zirconium	1.3	1.3	0.1	0	n/c	1.4	0.9	0.1	**43**	n/c	1.1	3.4	0.1	**102**	n/c

Notes:

Results are expressed in milligrams per kilogram (mg/kg), unless otherwise indicated.

m bgs = metres below ground surface

FDA = field duplicate available; FD = field duplicate

QA/QC = quality assurance/quality control

RPD = Relative percent difference; the difference between two values divided by the mean of the two values.

RPD is calculated when the mean concentration is greater than five times the detection limit.

DF = Difference factor; the absolute difference between two values divided by the method detection limit.

DF is calculated when the mean concentration is less than five times the detection limit.

HEPH = Heavy Extractable Petroleum Hydrocarbons

LEPH = Light Extractable Petroleum Hydrocarbons

NC = Not Calculated; NA = Not Applicable

Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 35% (50% for PAH only) for RPD and 2.0 for DF.

Table K-2
Results of Soil Quality Control Analyses - Metals and Inorganic Parameters
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-TP17-52-SA1	K19-TP17-52-SA1				K19-MW17-18-SA1	K19-MW17-18-SA1				K19-MW17-28-SA1	K19-MW17-28-SA1			
Sample Name	03796-06	03796-07	**RDL**	**RPD (%)**	**DF (unitless)**	03831-07	03831-08	**RDL**	**RPD (%)**	**DF (unitless)**	03837-09	03837-10	**RDL**	**RPD (%)**	**DF (unitless)**
Sample Collection Date	7/14/2017	7/14/2017				7/19/2017	7/19/2017				7/23/2017	7/23/2017			
Sample Depth	0.8 - 0.8 m	0.8 - 0.8 m				0.3 - 0.5 m	0.3 - 0.5 m				0.3 - 0.5 m	0.3 - 0.5 m			
Sodium/Chloride by Sat. Paste															
Chloride	-	-	-	-	-	3	3	2	n/c	0	20	14	2	**35**	n/c
Sodium (mg/L)	-	-	-	-	-	6	5	2	n/c	0.5	36	22	2	**48**	n/c
Metals															
pH	6.23	6.14	0.05	1	n/c	5.26	5.07	0.05	4	n/c	5.62	5.57	0.05	1	n/c
Aluminum	26700	29300	10	9	n/c	12300	13100	10	6	n/c	12500	12200	10	2	n/c
Antimony	0.4	0.4	0.1	n/c	0	0.6	0.6	0.1	0	n/c	0.6	0.6	0.1	0	n/c
Arsenic	11	11.1	0.1	1	n/c	9.4	10.5	0.1	11	n/c	11.3	11.2	0.1	1	n/c
Barium	689	811	0.5	16	n/c	203	199	0.5	2	n/c	695	837	0.5	19	n/c
Beryllium	1.5	1.8	0.1	18	n/c	0.6	0.7	0.1	15	n/c	0.9	0.8	0.1	12	n/c
Bismuth	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Cadmium	1.06	1.45	0.01	31	n/c	1.06	0.69	0.01	**42**	n/c	0.21	0.19	0.01	10	n/c
Calcium	8040	8010	10	0	n/c	1640	1440	10	13	n/c	1720	1630	10	5	n/c
Chromium	35	39	1	11	n/c	25	27	1	8	n/c	24	25	1	4	n/c
Cobalt	8.5	8.9	0.1	5	n/c	9.1	9	0.1	1	n/c	12.7	13	0.1	2	n/c
Copper	29.1	32.8	0.2	12	n/c	18.3	19.7	0.2	7	n/c	26.1	25.7	0.2	2	n/c
Iron	32000	33300	10	4	n/c	22300	23300	10	4	n/c	23400	23400	10	0	n/c
Lead	18.4	19.4	0.1	5	n/c	20	19.2	0.1	4	n/c	13.9	13.6	0.1	2	n/c
Lithium	27.6	33	0.5	18	n/c	16.5	17.8	0.5	8	n/c	16.3	16.1	0.5	1	n/c
Magnesium	3750	3670	10	2	n/c	2800	2920	10	4	n/c	2920	2870	10	2	n/c
Manganese	223	204	1	9	n/c	223	238	1	7	n/c	372	305	1	**20**	n/c
Mercury	0.06	0.07	0.01	15	n/c	0.03	0.03	0.01	n/c	0	0.04	0.04	0.01	n/c	0
Molybdenum	1.8	1.8	0.2	0	n/c	1.7	1.8	0.2	6	n/c	1.6	1.6	0.2	0	n/c
Nickel	47.9	58.1	0.5	19	n/c	20.5	22.5	0.5	9	n/c	30.3	28.6	0.5	6	n/c
Phosphorus	1520	1710	5	12	n/c	5.26	5.07	0.05	4	n/c	5.62	5.57	0.05	1	n/c
Potassium	2870	2860	5	0	n/c	325	330	5	2	n/c	486	497	5	2	n/c
Selenium	1.5	1.8	0.1	18	n/c	1580	1580	5	0	n/c	1910	2000	5	5	n/c
Silver	0.6	0.8	0.5	n/c	0.4	0.6	0.7	0.1	15	n/c	0.9	0.7	0.1	**25**	n/c
Sodium	-	-	-	-	-	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Strontium	51	54	1	6	n/c	25	26	1	4	n/c	35	36	1	3	n/c
Thallium	0.4	0.4	0.1	n/c	0	0.2	0.2	0.1	n/c	0	0.2	0.2	0.1	n/c	0
Tin	0.8	0.9	0.2	n/c	0.5	0.7	0.7	0.2	n/c	0	0.8	1.1	0.2	**32**	n/c
Titanium	122	90	1	30	n/c	122	109	1	11	n/c	105	109	1	4	n/c
Uranium	3.9	4.9	0.2	23	n/c	0.8	1	0.2	n/c	1	1.4	1.5	0.2	7	n/c
Vanadium	75	83	1	10	n/c	51	53	1	4	n/c	44	44	1	0	n/c
Zinc	107	117	1	9	n/c	248	212	1	16	n/c	100	96	1	4	n/c
Zirconium	1.3	1.3	0.1	0	n/c	1.4	1	0.1	**33**	n/c	1.7	1.6	0.1	6	n/c

Notes:
Results are expressed in milligrams per kilogram (mg/kg), unless otherwise indicated.
m bgs = metres below ground surface
FDA = field duplicate available; FD = field duplicate
QA/QC = quality assurance/quality control
RPD = Relative percent difference; the difference between two values divided by the mean of the two values.

RPD is calculated when the mean concentration is greater than five times the detection limit.
DF = Difference factor; the absolute difference between two values divided by the method detection limit.
DF is calculated when the mean concentration is less than five times the detection limit.
HEPH = Heavy Extractable Petroleum Hydrocarbons
LEPH = Light Extractable Petroleum Hydrocarbons
NC = Not Calculated; NA = Not Applicable
Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 35% (50% for PAH only) for RPD and 2.0 for DF.

Table K-2
Results of Soil Quality Control Analyses - Metals and Inorganic Parameters
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-TP17-52-SA1	K19-TP17-52-SA1				K19-TP17-85-SA3	K19-TP17-85-SA3				K19-MW17-35-SA2	K19-MW17-35-SA2			
Sample Name	03796-06	03796-07	RDL	RPD (%)	DF (unitless)	03842-05	03842-06	RDL	RPD (%)	DF (unitless)	03847-02	03847-03	RDL	RPD (%)	DF (unitless)
Sample Collection Date	7/14/2017	7/14/2017				7/22/2017	7/22/2017				7/27/2017	7/27/2017			
Sample Depth	0.8 - 0.8 m	0.8 - 0.8 m				2.5 - 2.5 m	2.5 - 2.5 m				1 - 1.5 m	1 - 1.5 m			
Sodium/Chloride by Sat. Paste															
Chloride	-	-	-	-	-	-	-	-	-	-	12	11	2	9	n/c
Sodium (mg/L)	-	-	-	-	-	-	-	-	-	-	10	10	2	0	n/c
Metals															
pH	6.23	6.14	0.05	1	n/c	6.48	6.53	0.05	1	n/c	6.99	7.23	0.05	3	n/c
Aluminum	26700	29300	10	9	n/c	11300	12900	10	13	n/c	7890	13000	10	**49**	n/c
Antimony	0.4	0.4	0.1	n/c	0	0.3	0.3	0.1	n/c	0	0.4	0.5	0.1	n/c	1
Arsenic	11	11.1	0.1	1	n/c	8.9	10.4	0.1	16	n/c	7.5	13.7	0.1	**58**	n/c
Barium	689	811	0.5	16	n/c	558	595	0.5	6	n/c	152	193	0.5	**24**	n/c
Beryllium	1.5	1.8	0.1	18	n/c	0.6	0.6	0.1	0	n/c	0.4	0.5	0.1	n/c	1
Bismuth	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Cadmium	1.06	1.45	0.01	31	n/c	0.12	0.11	0.01	9	n/c	0.22	0.27	0.01	**20**	n/c
Calcium	8040	8010	10	0	n/c	2460	2720	10	10	n/c	9000	18500	10	**69**	n/c
Chromium	35	39	1	11	n/c	19	23	1	19	n/c	13	16	1	**21**	n/c
Cobalt	8.5	8.9	0.1	5	n/c	6	5.2	0.1	14	n/c	5.7	7.7	0.1	**30**	n/c
Copper	29.1	32.8	0.2	12	n/c	20.1	20.2	0.2	0	n/c	14	24.9	0.2	**56**	n/c
Iron	32000	33300	10	4	n/c	23100	27800	10	18	n/c	17300	32300	10	**60**	n/c
Lead	18.4	19.4	0.1	5	n/c	19.1	19.6	0.1	3	n/c	13.3	13.9	0.1	4	n/c
Lithium	27.6	33	0.5	18	n/c	21.2	20.1	0.5	5	n/c	6.6	8.3	0.5	**23**	n/c
Magnesium	3750	3670	10	2	n/c	2860	3210	10	12	n/c	2220	7070	10	**104**	n/c
Manganese	223	204	1	9	n/c	114	103	1	10	n/c	219	342	1	**44**	n/c
Mercury	0.06	0.07	0.01	15	n/c	0.04	0.04	0.01	n/c	0	0.03	0.04	0.01	n/c	1
Molybdenum	1.8	1.8	0.2	0	n/c	0.7	0.7	0.2	n/c	0	1.3	1.4	0.2	7	n/c
Nickel	47.9	58.1	0.5	19	n/c	19	18.7	0.5	2	n/c	12.3	18.4	0.5	**40**	n/c
Phosphorus	1520	1710	5	12	n/c	6.48	6.53	0.05	1	n/c	6.99	7.23	0.05	3	n/c
Potassium	2870	2860	5	0	n/c	462	629	5	31	n/c	539	937	5	**54**	n/c
Selenium	1.5	1.8	0.1	18	n/c	1960	2250	5	14	n/c	1030	1710	5	**50**	n/c
Silver	0.6	0.8	0.5	n/c	0.4	0.7	0.6	0.1	15	n/c	0.5	0.6	0.1	18	n/c
Sodium	-	-	-	-	-	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Strontium	51	54	1	6	n/c	41	41	1	0	n/c	23	22	1	4	n/c
Thallium	0.4	0.4	0.1	n/c	0	0.2	0.1	0.1	n/c	1	0.1	0.1	0.1	n/c	0
Tin	0.8	0.9	0.2	n/c	0.5	0.7	0.6	0.2	n/c	0.5	0.4	0.5	0.2	n/c	0.5
Titanium	122	90	1	30	n/c	22	25	1	13	n/c	30	54	1	**57**	n/c
Uranium	3.9	4.9	0.2	23	n/c	1.6	1.8	0.2	12	n/c	0.7	0.8	0.2	n/c	0.5
Vanadium	75	83	1	10	n/c	24	24	1	0	n/c	31	38	1	**20**	n/c
Zinc	107	117	1	9	n/c	65	66	1	2	n/c	57	91	1	**46**	n/c
Zirconium	1.3	1.3	0.1	0	n/c	1.7	1.7	0.1	0	n/c	0.4	0.3	0.1	n/c	1

Notes:
Results are expressed in milligrams per kilogram (mg/kg), unless otherwise indicated.
m bgs = metres below ground surface
FDA = field duplicate available; FD = field duplicate
QA/QC = quality assurance/quality control
RPD = Relative percent difference; the difference between two values divided by the mean of the two values.

RPD is calculated when the mean concentration is greater than five times the detection limit.
DF = Difference factor; the absolute difference between two values divided by the method detection limit.
DF is calculated when the mean concentration is less than five times the detection limit.
HEPH = Heavy Extractable Petroleum Hydrocarbons
LEPH = Light Extractable Petroleum Hydrocarbons
NC = Not Calculated; NA = Not Applicable
Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 35% (50% for PAH only) for RPD and 2.0 for DF.

Table K-2
Results of Soil Quality Control Analyses - Metals and Inorganic Parameters
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-TP17-52-SA1	K19-TP17-52-SA1				K19-HA17-04	K19-HA17-04				K19-TP17-62-SA1	K19-TP17-62-SA1			
Sample Name	03796-06	03796-07	RDL	RPD (%)	DF (unitless)	03811-05	03811-06	RDL	RPD (%)	DF (unitless)	03823-05	03823-06	RDL	RPD (%)	DF (unitless)
Sample Collection Date	7/14/2017	7/14/2017				17-Jul-17	17-Jul-17				16-Jul-17	16-Jul-17			
Sample Depth	0.8 - 0.8 m	0.8 - 0.8 m				0.4-0.6	0.4-0.6				0.6	0.6			
Sodium/Chloride by Sat. Paste															
Chloride	-	-	-	-	-	103	156	2	**41**	n/c	< 2	3	2	n/c	n/c
Sodium (mg/L)	-	-	-	-	-	117	170	2	**37**	n/c	10	12	2	18	n/c
Metals															
pH	6.23	6.14	0.05	1	n/c	-	-	-	-	-	-	-	-	-	-
Aluminum	26700	29300	10	9	n/c	-	-	-	-	-	-	-	-	-	-
Antimony	0.4	0.4	0.1	n/c	0	-	-	-	-	-	-	-	-	-	-
Arsenic	11	11.1	0.1	1	n/c	-	-	-	-	-	-	-	-	-	-
Barium	689	811	0.5	16	n/c	-	-	-	-	-	-	-	-	-	-
Beryllium	1.5	1.8	0.1	18	n/c	-	-	-	-	-	-	-	-	-	-
Bismuth	< 0.5	< 0.5	0.5	n/c	0	-	-	-	-	-	-	-	-	-	-
Cadmium	1.06	1.45	0.01	31	n/c	-	-	-	-	-	-	-	-	-	-
Calcium	8040	8010	10	0	n/c	-	-	-	-	-	-	-	-	-	-
Chromium	35	39	1	11	n/c	-	-	-	-	-	-	-	-	-	-
Cobalt	8.5	8.9	0.1	5	n/c	-	-	-	-	-	-	-	-	-	-
Copper	29.1	32.8	0.2	12	n/c	-	-	-	-	-	-	-	-	-	-
Iron	32000	33300	10	4	n/c	-	-	-	-	-	-	-	-	-	-
Lead	18.4	19.4	0.1	5	n/c	-	-	-	-	-	-	-	-	-	-
Lithium	27.6	33	0.5	18	n/c	-	-	-	-	-	-	-	-	-	-
Magnesium	3750	3670	10	2	n/c	-	-	-	-	-	-	-	-	-	-
Manganese	223	204	1	9	n/c	-	-	-	-	-	-	-	-	-	-
Mercury	0.06	0.07	0.01	15	n/c	-	-	-	-	-	-	-	-	-	-
Molybdenum	1.8	1.8	0.2	0	n/c	-	-	-	-	-	-	-	-	-	-
Nickel	47.9	58.1	0.5	19	n/c	-	-	-	-	-	-	-	-	-	-
Phosphorus	1520	1710	5	12	n/c	-	-	-	-	-	-	-	-	-	-
Potassium	2870	2860	5	0	n/c	-	-	-	-	-	-	-	-	-	-
Selenium	1.5	1.8	0.1	18	n/c	-	-	-	-	-	-	-	-	-	-
Silver	0.6	0.8	0.5	n/c	0.4	-	-	-	-	-	-	-	-	-	-
Sodium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Strontium	51	54	1	6	n/c	-	-	-	-	-	-	-	-	-	-
Thallium	0.4	0.4	0.1	n/c	0	-	-	-	-	-	-	-	-	-	-
Tin	0.8	0.9	0.2	n/c	0.5	-	-	-	-	-	-	-	-	-	-
Titanium	122	90	1	30	n/c	-	-	-	-	-	-	-	-	-	-
Uranium	3.9	4.9	0.2	23	n/c	-	-	-	-	-	-	-	-	-	-
Vanadium	75	83	1	10	n/c	-	-	-	-	-	-	-	-	-	-
Zinc	107	117	1	9	n/c	-	-	-	-	-	-	-	-	-	-
Zirconium	1.3	1.3	0.1	0	n/c	-	-	-	-	-	-	-	-	-	-

Notes:

Results are expressed in milligrams per kilogram (mg/kg), unless otherwise indicated.

m bgs = metres below ground surface

FDA = field duplicate available; FD = field duplicate

QA/QC = quality assurance/quality control

RPD = Relative percent difference; the difference between two values divided by the mean of the two values.

RPD is calculated when the mean concentration is greater than five times the detection limit.

DF = Difference factor; the absolute difference between two values divided by the method detection limit.

DF is calculated when the mean concentration is less than five times the detection limit.

HEPH = Heavy Extractable Petroleum Hydrocarbons

LEPH = Light Extractable Petroleum Hydrocarbons

NC = Not Calculated; NA = Not Applicable

Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 35% (50% for PAH only) for RPD and 2.0 for DF.

Table K-3
Results of Soil Quality Control Analyses - Petroleum Hydrocarbons
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-TP17-52-SA1	K19-TP17-52-SA1				K19-TP17-57-SA1	K19-TP17-57-SA1				K19-TP17-62-SA1	K19-TP17-62-SA1			
Sample Name	03796-06	03796-07	**RDL**	**RPD (%)**	**DF (unitless)**	03821-05	03821-06	**RDL**	**RPD (%)**	**DF (unitless)**	03823-05	03823-06	**RDL**	**RPD (%)**	**DF (unitless)**
Sample Collection Date	7/14/2017	7/14/2017				7/15/2017	7/15/2017				7/16/2017	7/16/2017			
Sample Matrix	SO	SO				SO	SO				SO	SO			
Sample Depth	0.8 - 0.8 m	0.8 - 0.8 m				0.6 - 0.6 m	0.6 - 0.6 m				0.6 - 0.6 m	0.6 - 0.6 m			
PAH															
2-methylnaphthalene	0.023	0.028	0.005	20	n/c	< 0.005	-	0.005	n/c	n/c	< 0.005	< 0.005	0.005	n/c	0
Acenaphthene	< 0.005	< 0.005	0.005	n/c	0	< 0.005	-	0.005	n/c	n/c	< 0.005	< 0.005	0.005	n/c	0
Acenaphthylene	< 0.005	< 0.005	0.005	n/c	0	< 0.005	-	0.005	n/c	n/c	< 0.005	< 0.005	0.005	n/c	0
Anthracene	< 0.004	< 0.004	0.004	n/c	0	< 0.004	-	0.004	n/c	n/c	< 0.004	< 0.004	0.004	n/c	0
Benzo(a)anthracene	< 0.03	< 0.03	0.03	n/c	0	< 0.03	-	0.03	n/c	n/c	< 0.03	< 0.03	0.03	n/c	0
Benzo(a)pyrene	< 0.03	< 0.03	0.03	n/c	0	< 0.03	-	0.03	n/c	n/c	< 0.03	< 0.03	0.03	n/c	0
Benzo(a)pyrene Total Potency Equivalence (TPE)	< 0.05	< 0.05	0.05	n/c	0	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Benzo(b)fluoranthene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Benzo(b,j) fluoranthene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Benzo(g,h,i)perylene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Benzo(k)fluoranthene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Chrysene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Dibenzo(a,h)anthracene	< 0.005	< 0.005	0.005	n/c	0	< 0.005	-	0.005	n/c	n/c	< 0.005	< 0.005	0.005	n/c	0
EPH (C10-C19)	34	45	20	n/c	0.55	< 20	-	20	n/c	n/c	313	252	20	22	n/c
EPH (C19-C32)	152	170	20	11	n/c	< 20	-	20	n/c	n/c	280	284	20	1	n/c
Fluoranthene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	-	0.01	n/c	n/c	< 0.01	< 0.01	0.01	n/c	0
Fluorene	< 0.02	< 0.02	0.02	n/c	0	< 0.02	-	0.02	n/c	n/c	< 0.02	< 0.02	0.02	n/c	0
HEPH	152	170	20	11	n/c	< 20	-	20	n/c	n/c	280	284	20	1	n/c
Indeno(1,2,3-c,d)pyrene	< 0.02	< 0.02	0.02	n/c	0	< 0.02	-	0.02	n/c	n/c	< 0.02	< 0.02	0.02	n/c	0
Index of Additive Cancer Risk (IACR)	< 0.6	< 0.6	0.6	n/c	0	< 0.6	-	0.6	n/c	n/c	< 0.6	< 0.6	0.6	n/c	0
LEPH	34	44	20	n/c	0.5	< 20	-	20	n/c	n/c	313	252	20	22	n/c
Naphthalene	0.022	0.026	0.005	17	n/c	< 0.005	-	0.005	n/c	n/c	< 0.005	< 0.005	0.005	n/c	0
Phenanthrene	< 0.02	< 0.02	0.02	n/c	0	< 0.02	-	0.02	n/c	n/c	< 0.02	< 0.02	0.02	n/c	0
Pyrene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	-	0.01	n/c	n/c	< 0.01	< 0.01	0.01	n/c	0
Quinoline	< 0.05	< 0.05	0.05	n/c	0	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Volatile Hydrocarbon Fraction	< 10	< 10	10	n/c	0	< 10	< 10	10	n/c	0	-	-	-	-	-
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	< 10	< 10	10	n/c	0	< 10	< 10	10	n/c	0	-	-	-	-	-
Total Organic Carbon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

Results are expressed in milligrams per kilogram (mg/kg), unless otherwise indicated.

m bgs = metres below ground surface

FDA = field duplicate available; FD = field duplicate

QA/QC = quality assurance/quality control

RPD = Relative percent difference; the difference between two values divided by the mean of the two values.

RPD is calculated when the mean concentration is greater than five times the detection limit.

DF = Difference factor; the absolute difference between two values divided by the method detection limit.

DF is calculated when the mean concentration is less than five times the detection limit.

HEPH = Heavy Extractable Petroleum Hydrocarbons

LEPH = Light Extractable Petroleum Hydrocarbons

NC = Not Calculated; NA = Not Applicable

Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 35% (50% for PAH only) for RPD and 2.0 for DF.

Table K-3
Results of Soil Quality Control Analyses - Petroleum Hydrocarbons
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-TP17-65-SA2	K19-TP17-65-SA2				K19-TP17-71-SA3	K19-TP17-71-SA3				K19-MW17-18-SA1	K19-MW17-18-SA1			
Sample Name	03824-08	03824-09				03827-03	03827-04				03813-07	03813-08			
Sample Collection Date	7/17/2017	7/17/2017				7/18/2017	7/18/2017				7/18/2017	7/18/2017			
Sample Matrix	SO	SO				SO	SO				SO	SO			
Sample Depth	1.5 - 1.5 m	1.5 - 1.5 m	**RDL**	**RPD (%)**	**DF (unitless)**	2.5 - 2.5 m	2.5 - 2.5 m	**RDL**	**RPD (%)**	**DF (unitless)**	0.3 - 0.5 m	0.3 - 0.5 m	**RDL**	**RPD (%)**	**DF (unitless)**
PAH															
2-methylnaphthalene	< 0.005	< 0.005	0.005	n/c	0	< 0.005	< 0.005	0.005	n/c	0	-	< 0.005	0.005	n/c	n/c
Acenaphthene	< 0.005	< 0.005	0.005	n/c	0	< 0.005	< 0.005	0.005	n/c	0	-	< 0.005	0.005	n/c	n/c
Acenaphthylene	< 0.005	< 0.005	0.005	n/c	0	< 0.005	< 0.005	0.005	n/c	0	-	< 0.005	0.005	n/c	n/c
Anthracene	< 0.004	< 0.004	0.004	n/c	0	< 0.004	< 0.004	0.004	n/c	0	-	< 0.004	0.004	n/c	n/c
Benzo(a)anthracene	< 0.03	< 0.03	0.03	n/c	0	< 0.03	< 0.03	0.03	n/c	0	-	< 0.03	0.03	n/c	n/c
Benzo(a)pyrene	< 0.03	< 0.03	0.03	n/c	0	< 0.03	< 0.03	0.03	n/c	0	-	< 0.03	0.03	n/c	n/c
Benzo(a)pyrene Total Potency Equivalence (TPE)	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
Benzo(b)fluoranthene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
Benzo(b,j) fluoranthene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
Benzo(g,h,i)perylene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
Benzo(k)fluoranthene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
Chrysene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
Dibenzo(a,h)anthracene	< 0.005	< 0.005	0.005	n/c	0	< 0.005	< 0.005	0.005	n/c	0	-	< 0.005	0.005	n/c	n/c
EPH (C10-C19)	< 20	< 20	20	n/c	0	< 20	< 20	20	n/c	0	-	-	-	-	-
EPH (C19-C32)	< 20	< 20	20	n/c	0	< 20	< 20	20	n/c	0	-	-	-	-	-
Fluoranthene	< 0.01	< 0.01	0.01	n/c	0	0.01	0.01	0.01	n/c	0	-	< 0.01	0.01	n/c	n/c
Fluorene	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0	-	< 0.02	0.02	n/c	n/c
HEPH	< 20	< 20	20	n/c	0	< 20	< 20	20	n/c	0	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0	-	< 0.02	0.02	n/c	n/c
Index of Additive Cancer Risk (IACR)	< 0.6	< 0.6	0.6	n/c	0	< 0.6	< 0.6	0.6	n/c	0	-	< 0.6	0.6	n/c	n/c
LEPH	< 20	< 20	20	n/c	0	< 20	< 20	20	n/c	0	-	-	-	-	-
Naphthalene	< 0.005	< 0.005	0.005	n/c	0	< 0.005	0.006	0.005	n/c	0.2	-	< 0.005	0.005	n/c	n/c
Phenanthrene	< 0.02	< 0.02	0.02	n/c	0	0.05	0.07	0.02	n/c	1	-	< 0.02	0.02	n/c	n/c
Pyrene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0	-	< 0.01	0.01	n/c	n/c
Quinoline	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
Volatile Hydrocarbon Fraction	-	-	-	-	-	< 10	< 10	10	n/c	0	< 10	< 10	10	n/c	0
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	-	-	-	-	-	< 10	< 10	10	n/c	0	< 10	< 10	10	n/c	0
Total Organic Carbon	-	-	-	-	-	-	-	-	-	-	-	1.23	0.02	n/c	n/c

Notes:
Results are expressed in milligrams per kilogram (mg/kg), unless otherwise indicated.
m bgs = metres below ground surface
FDA = field duplicate available; FD = field duplicate
QA/QC = quality assurance/quality control
RPD = Relative percent difference; the difference between two values divided by the mean of the two values.
RPD is calculated when the mean concentration is greater than five times the detection limit.
DF = Difference factor; the absolute difference between two values divided by the method detection limit.
DF is calculated when the mean concentration is less than five times the detection limit.
HEPH = Heavy Extractable Petroleum Hydrocarbons
LEPH = Light Extractable Petroleum Hydrocarbons
NC = Not Calculated; NA = Not Applicable
Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 35% (50% for PAH only) for RPD and 2.0 for DF.

Table K-3
Results of Soil Quality Control Analyses - Petroleum Hydrocarbons
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-MW17-26-SA3	K19-MW17-26-SA4				K19-TP17-74-SA2	K19-TP17-74-SA2				K19-MW17-31-SA5	K19-MW17-31-SA5			
Sample Name	03836-08	03836-09				03828-02	03828-03				03839-09	03839-10			
Sample Collection Date	7/22/2017	7/22/2017				7/20/2017	7/20/2017				7/26/2017	7/26/2017			
Sample Matrix	SO	SO				SO	SO				SO	SO			
Sample Depth	3.5 - 4 m	3.5 - 4 m	**RDL**	**RPD (%)**	**DF (unitless)**	1.6 - 1.6 m	1.6 - 1.6 m	**RDL**	**RPD (%)**	**DF (unitless)**	6.4 - 6.8 m	6.4 - 6.8 m	**RDL**	**RPD (%)**	**DF (unitless)**
PAH															
2-methylnaphthalene	1.3	1.24	0.05	5	n/c	< 0.005	-	0.005	n/c	n/c	2.17	2.47	0.05	13	n/c
Acenaphthene	< 0.05	< 0.05	0.05	n/c	0	< 0.005	-	0.005	n/c	n/c	< 0.005	< 0.005	0.005	n/c	0
Acenaphthylene	< 0.05	< 0.05	0.05	n/c	0	< 0.005	-	0.005	n/c	n/c	< 0.005	< 0.005	0.005	n/c	0
Anthracene	< 0.004	< 0.004	0.004	n/c	0	< 0.004	-	0.004	n/c	n/c	< 0.004	< 0.004	0.004	n/c	0
Benzo(a)anthracene	< 0.03	< 0.03	0.03	n/c	0	< 0.03	-	0.03	n/c	n/c	< 0.03	< 0.03	0.03	n/c	0
Benzo(a)pyrene	0.03	0.04	0.03	n/c	0.333333333	< 0.03	-	0.03	n/c	n/c	0.03	0.04	0.03	n/c	0.333333333
Benzo(a)pyrene Total Potency Equivalence (TPE)	0.05	0.06	0.05	n/c	0.2	< 0.05	-	0.05	n/c	n/c	0.05	0.06	0.05	n/c	0.2
Benzo(b)fluoranthene	0.05	0.05	0.05	n/c	0	< 0.05	-	0.05	n/c	n/c	0.06	0.06	0.05	n/c	0
Benzo(b,j) fluoranthene	0.05	0.05	0.05	n/c	0	< 0.05	-	0.05	n/c	n/c	0.06	0.06	0.05	n/c	0
Benzo(g,h,i)perylene	0.26	0.29	0.05	11	n/c	< 0.05	-	0.05	n/c	n/c	0.23	0.25	0.05	n/c	0.4
Benzo(k)fluoranthene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Chrysene	0.11	0.12	0.05	n/c	0.2	< 0.05	-	0.05	n/c	n/c	0.11	0.12	0.05	n/c	0.2
Dibenzo(a,h)anthracene	0.009	0.01	0.005	n/c	0.2	< 0.005	-	0.005	n/c	n/c	0.006	0.006	0.005	n/c	0
EPH (C10-C19)	83	80	20	n/c	0.15	< 20	-	20	n/c	n/c	80	84	20	n/c	0.2
EPH (C19-C32)	82	80	20	n/c	0.1	22	-	20	n/c	n/c	81	85	20	n/c	0.2
Fluoranthene	0.05	0.06	0.01	18	n/c	< 0.01	-	0.01	n/c	n/c	0.05	0.06	0.01	18	n/c
Fluorene	0.16	0.18	0.02	12	n/c	< 0.02	-	0.02	n/c	n/c	0.21	0.23	0.02	9	n/c
HEPH	81	80	20	n/c	0.05	22	-	20	n/c	n/c	81	85	20	n/c	0.2
Indeno(1,2,3-c,d)pyrene	< 0.02	0.02	0.02	n/c	0	< 0.02	-	0.02	n/c	n/c	< 0.02	< 0.02	0.02	n/c	0
Index of Additive Cancer Risk (IACR)	0.8	0.9	0.6	n/c	0.166666667	< 0.6	-	0.6	n/c	n/c	0.9	0.9	0.6	n/c	0
LEPH	82	79	20	n/c	0.15	< 20	-	20	n/c	n/c	79	82	20	n/c	0.15
Naphthalene	0.59	0.52	0.05	13	n/c	< 0.005	-	0.005	n/c	n/c	1.22	1.53	0.05	23	n/c
Phenanthrene	0.47	0.52	0.02	10	n/c	< 0.02	-	0.02	n/c	n/c	0.55	0.6	0.02	9	n/c
Pyrene	0.09	0.1	0.01	11	n/c	< 0.01	-	0.01	n/c	n/c	0.1	0.1	0.01	0	n/c
Quinoline	< 0.05	< 0.05	0.05	n/c	0	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Volatile Hydrocarbon Fraction	20	19	10	n/c	0.1	< 10	< 10	10	n/c	0	32	28	10	n/c	0.4
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	20	19	10	n/c	0.1	< 10	< 10	10	n/c	0	31	27	10	n/c	0.4
Total Organic Carbon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
Results are expressed in milligrams per kilogram (mg/kg), unless otherwise indicated.
m bgs = metres below ground surface
FDA = field duplicate available; FD = field duplicate
QA/QC = quality assurance/quality control
RPD = Relative percent difference; the difference between two values divided by the mean of the two values.
RPD is calculated when the mean concentration is greater than five times the detection limit.
DF = Difference factor; the absolute difference between two values divided by the method detection limit.
DF is calculated when the mean concentration is less than five times the detection limit.
HEPH = Heavy Extractable Petroleum Hydrocarbons
LEPH = Light Extractable Petroleum Hydrocarbons
NC = Not Calculated; NA = Not Applicable
Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 35% (50% for PAH only) for RPD and 2.0 for DF.

Table K-3
Results of Soil Quality Control Analyses - Petroleum Hydrocarbons
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-MW17-34-SA3	K19-MW17-34-SA3				K19-MW17-35-SA2	K19-MW17-35-SA2				K19-MW17-35-SA6	K19-MW17-35-SA6			
Sample Name	03846-09	03846-10	**RDL**	**RPD (%)**	**DF (unitless)**	03847-02	03847-03	**RDL**	**RPD (%)**	**DF (unitless)**	03847-07	03847-08	**RDL**	**RPD (%)**	**DF (unitless)**
Sample Collection Date	7/27/2017	7/27/2017				7/27/2017	7/27/2017				7/27/2017	7/27/2017			
Sample Matrix	SO	SO				SO	SO				SO	SO			
Sample Depth	3.5 - 4 m	3.5 - 4 m				1 - 1.5 m	1 - 1.5 m				4 - 4.5 m	4 - 4.5 m			
PAH															
2-methylnaphthalene	0.544	0.657	0.005	19	n/c	3.76	3.29	0.05	13	n/c	0.119	0.19	0.005	46	n/c
Acenaphthene	< 0.005	< 0.005	0.005	n/c	0	< 0.005	< 0.005	0.005	n/c	0	0.012	< 0.005	0.005	n/c	1.4
Acenaphthylene	< 0.005	< 0.005	0.005	n/c	0	< 0.005	< 0.005	0.005	n/c	0	< 0.005	< 0.005	0.005	n/c	0
Anthracene	< 0.004	< 0.004	0.004	n/c	0	< 0.004	< 0.004	0.004	n/c	0	< 0.004	< 0.004	0.004	n/c	0
Benzo(a)anthracene	< 0.03	< 0.03	0.03	n/c	0	< 0.03	< 0.03	0.03	n/c	0	< 0.03	< 0.03	0.03	n/c	0
Benzo(a)pyrene	0.03	0.03	0.03	n/c	0	< 0.03	< 0.03	0.03	n/c	0	< 0.03	< 0.03	0.03	n/c	0
Benzo(a)pyrene Total Potency Equivalence (TPE)	0.05	0.06	0.05	n/c	0.2	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Benzo(b)fluoranthene	0.07	0.09	0.05	n/c	0.4	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Benzo(b,j) fluoranthene	0.07	0.09	0.05	n/c	0.4	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Benzo(g,h,i)perylene	0.18	0.18	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Benzo(k)fluoranthene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Chrysene	0.12	0.12	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Dibenzo(a,h)anthracene	0.01	0.011	0.005	n/c	0.2	< 0.005	< 0.005	0.005	n/c	0	0.005	0.005	0.005	n/c	0
EPH (C10-C19)	61	64	20	n/c	0.15	374	308	20	19	n/c	61	77	20	n/c	0.8
EPH (C19-C32)	82	81	20	n/c	0.05	400	318	20	23	n/c	66	82	20	n/c	0.8
Fluoranthene	0.05	0.05	0.01	n/c	0	0.01	0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Fluorene	0.03	0.03	0.02	n/c	0	0.13	0.1	0.02	26	n/c	< 0.02	< 0.02	0.02	n/c	0
HEPH	82	80	20	n/c	0.1	400	318	20	23	n/c	66	82	20	n/c	0.8
Indeno(1,2,3-c,d)pyrene	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0
Index of Additive Cancer Risk (IACR)	1	1.1	0.6	n/c	0.166666667	< 0.6	< 0.6	0.6	n/c	0	< 0.6	< 0.6	0.6	n/c	0
LEPH	60	63	20	n/c	0.15	372	307	20	19	n/c	60	76	20	n/c	0.8
Naphthalene	0.121	0.151	0.005	22	n/c	1.17	1.01	0.05	15	n/c	0.387	0.471	0.005	20	n/c
Phenanthrene	0.47	0.5	0.02	6	n/c	0.19	0.13	0.02	38	n/c	0.07	0.07	0.02	n/c	0
Pyrene	0.09	0.08	0.01	12	n/c	0.01	0.01	0.01	n/c	0	0.01	0.01	0.01	n/c	0
Quinoline	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Volatile Hydrocarbon Fraction	12	11	10	n/c	0.1	20	17	10	n/c	0.3	36	44	10	n/c	0.8
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	12	11	10	n/c	0.1	19	17	10	n/c	0.2	34	42	10	n/c	0.8
Total Organic Carbon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

Results are expressed in milligrams per kilogram (mg/kg), unless otherwise indicated.

m bgs = metres below ground surface

FDA = field duplicate available; FD = field duplicate

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RPD = Relative percent difference; the difference between two values divided by the mean of the two values.

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DF is calculated when the mean concentration is less than five times the detection limit.

HEPH = Heavy Extractable Petroleum Hydrocarbons

LEPH = Light Extractable Petroleum Hydrocarbons

NC = Not Calculated; NA = Not Applicable

Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 35% (50% for PAH only) for RPD and 2.0 for DF.

Table K-3
Results of Soil Quality Control Analyses - Petroleum Hydrocarbons
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-MW17-29-SA4	K19-MW17-29-SA4				K19-MW17-20-SA5	K19-MW17-20-SA5				K19-MW17-22-SA4	K19-MW17-22-SA4			
Sample Name	03838-07	03838-08	RDL	RPD (%)	DF (unitless)	03833-05	03833-06	RDL	RPD (%)	DF (unitless)	03834-06	03834-07	RDL	RPD (%)	DF (unitless)
Sample Collection Date	7/24/2017	7/24/2017				7/20/2017	7/20/2017				7/21/2017	7/21/2017			
Sample Matrix	SO	SO				SO	SO				SO	SO			
Sample Depth	3.4 - 3.7 m	3.4 - 3.7 m				5.8 - 6.8 m	5.8 - 6.8 m				4.5 - 5 m	4.5 - 5 m			
PAH															
2-methylnaphthalene	0.34	0.51	0.05	40	n/c	2.74	1.72	0.05	46	n/c	1.93	1.62	0.05	17	n/c
Acenaphthene	< 0.005	< 0.05	0.05	n/c	0.9	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Acenaphthylene	< 0.005	< 0.05	0.05	n/c	0.9	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Anthracene	< 0.004	< 0.004	0.004	n/c	0	< 0.04	< 0.04	0.04	n/c	0	< 0.04	< 0.04	0.04	n/c	0
Benzo(a)anthracene	< 0.03	< 0.03	0.03	n/c	0	< 0.03	< 0.03	0.03	n/c	0	< 0.03	< 0.03	0.03	n/c	0
Benzo(a)pyrene	< 0.03	< 0.03	0.03	n/c	0	0.03	< 0.03	0.03	n/c	0	< 0.03	0.03	0.03	n/c	0
Benzo(a)pyrene Total Potency Equivalence (TPE)	< 0.05	< 0.05	0.05	n/c	0	0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Benzo(b)fluoranthene	< 0.05	< 0.05	0.05	n/c	0	0.06	< 0.05	0.05	n/c	0.2	< 0.05	0.05	0.05	n/c	0
Benzo(b,j) fluoranthene	< 0.05	< 0.05	0.05	n/c	0	0.06	< 0.05	0.05	n/c	0.2	< 0.05	0.05	0.05	n/c	0
Benzo(g,h,i)perylene	< 0.05	< 0.05	0.05	n/c	0	0.15	0.13	0.05	n/c	0.4	0.1	0.17	0.05	n/c	1.4
Benzo(k)fluoranthene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Chrysene	< 0.05	< 0.05	0.05	n/c	0	0.13	0.08	0.05	n/c	1	0.08	0.08	0.05	n/c	0
Dibenzo(a,h)anthracene	0.006	0.006	0.005	n/c	0	0.006	< 0.005	0.005	n/c	0.2	< 0.005	< 0.005	0.005	n/c	0
EPH (C10-C19)	484	573	20	17	n/c	124	81	20	42	n/c	75	77	20	n/c	0.1
EPH (C19-C32)	85	89	20	n/c	0.2	121	72	20	**51**	n/c	73	76	20	n/c	0.15
Fluoranthene	< 0.01	< 0.01	0.01	n/c	0	0.04	0.03	0.01	n/c	1	0.03	0.04	0.01	n/c	1
Fluorene	0.08	0.12	0.02	40	n/c	0.2	< 0.2	0.2	n/c	0	< 0.2	< 0.2	0.2	n/c	0
HEPH	84	89	20	n/c	0.25	121	72	20	**51**	n/c	73	76	20	n/c	0.15
Indeno(1,2,3-c,d)pyrene	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0
Index of Additive Cancer Risk (IACR)	0.6	0.6	0.6	n/c	0	0.9	0.6	0.6	n/c	0.5	0.6	0.8	0.6	n/c	0.333333333
LEPH	483	572	20	17	n/c	122	80	20	42	n/c	73	75	20	n/c	0.1
Naphthalene	0.746	0.96	0.05	25	n/c	1.54	0.94	0.05	48	n/c	1.28	1.08	0.05	17	n/c
Phenanthrene	0.16	0.18	0.02	12	n/c	0.5	0.4	0.2	n/c	0.5	0.4	0.4	0.2	n/c	0
Pyrene	< 0.01	< 0.01	0.01	n/c	0	0.08	0.06	0.01	29	n/c	0.06	0.07	0.01	15	n/c
Quinoline	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Volatile Hydrocarbon Fraction	31	47	10	n/c	1.6	33	60	10	**58**	n/c	40	-	10	n/c	n/c
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	30	46	10	n/c	1.6	32	59	10	**59**	n/c	38	-	10	n/c	n/c
Total Organic Carbon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
Results are expressed in milligrams per kilogram (mg/kg), unless otherwise indicated.
m bgs = metres below ground surface
FDA = field duplicate available; FD = field duplicate
QA/QC = quality assurance/quality control
RPD = Relative percent difference; the difference between two values divided by the mean of the two values.
RPD is calculated when the mean concentration is greater than five times the detection limit.
DF = Difference factor; the absolute difference between two values divided by the method detection limit.
DF is calculated when the mean concentration is less than five times the detection limit.
HEPH = Heavy Extractable Petroleum Hydrocarbons
LEPH = Light Extractable Petroleum Hydrocarbons
NC = Not Calculated; NA = Not Applicable
Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 35% (50% for PAH only) for RPD and 2.0 for DF.

Table K-3
Results of Soil Quality Control Analyses - Petroleum Hydrocarbons
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-TP17-82-SA2	K19-TP17-82-SA2			
Sample Name	03841-02	03841-03			
Sample Collection Date	7/21/2017	7/21/2017			
Sample Matrix	SO	SO			
Sample Depth	1.4 - 1.4 m	1.4 - 1.4 m	**RDL**	**RPD (%)**	**DF (unitless)**
PAH					
2-methylnaphthalene	< 0.005	< 0.005	0.005	n/c	0
Acenaphthene	< 0.005	< 0.005	0.005	n/c	0
Acenaphthylene	< 0.005	< 0.005	0.005	n/c	0
Anthracene	< 0.004	< 0.004	0.004	n/c	0
Benzo(a)anthracene	< 0.03	< 0.03	0.03	n/c	0
Benzo(a)pyrene	< 0.03	< 0.03	0.03	n/c	0
Benzo(a)pyrene Total Potency Equivalence (TPE)	< 0.05	< 0.05	0.05	n/c	0
Benzo(b)fluoranthene	< 0.05	< 0.05	0.05	n/c	0
Benzo(b,j) fluoranthene	< 0.05	< 0.05	0.05	n/c	0
Benzo(g,h,i)perylene	< 0.05	< 0.05	0.05	n/c	0
Benzo(k)fluoranthene	< 0.05	< 0.05	0.05	n/c	0
Chrysene	< 0.05	< 0.05	0.05	n/c	0
Dibenzo(a,h)anthracene	0.005	0.008	0.005	n/c	0.6
EPH (C10-C19)	304	485	20	46	n/c
EPH (C19-C32)	31	42	20	n/c	0.55
Fluoranthene	< 0.01	< 0.01	0.01	n/c	0
Fluorene	< 0.02	< 0.02	0.02	n/c	0
HEPH	31	41	20	n/c	0.5
Indeno(1,2,3-c,d)pyrene	< 0.02	< 0.02	0.02	n/c	0
Index of Additive Cancer Risk (IACR)	< 0.6	0.6	0.6	n/c	0
LEPH	304	485	20	46	n/c
Naphthalene	0.008	< 0.005	0.005	n/c	0.6
Phenanthrene	0.03	0.05	0.02	n/c	1
Pyrene	< 0.01	< 0.01	0.01	n/c	0
Quinoline	< 0.05	< 0.05	0.05	n/c	0
Volatile Hydrocarbon Fraction	< 10	< 10	10	n/c	0
Volatile Petroleum Hydrocarbons: BTEX,VPH,LEPH & HEPH;PAH corrected	< 10	< 10	10	n/c	0
Total Organic Carbon					

Notes:
Results are expressed in milligrams per kilogram (mg/kg), unless otherwise indicated.
m bgs = metres below ground surface
FDA = field duplicate available; FD = field duplicate
QA/QC = quality assurance/quality control
RPD = Relative percent difference; the difference between two values divided by the mean of the two values.
RPD is calculated when the mean concentration is greater than five times the detection limit.
DF = Difference factor; the absolute difference between two values divided by the method detection limit.
DF is calculated when the mean concentration is less than five times the detection limit.
HEPH = Heavy Extractable Petroleum Hydrocarbons
LEPH = Light Extractable Petroleum Hydrocarbons
NC = Not Calculated; NA = Not Applicable
Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 35% (50% for PAH only) for RPD and 2.0 for DF.

Table K-4
Results of Soil Quality Control Analyses - Volatile Organic Carbons
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-TP17-52-SA1	K19-TP17-52-SA1				K19-TP17-57-SA1	K19-TP17-57-SA1			
Sample Name	03796-06	03796-07	**RDL**	**RPD (%)**	**DF (unitless)**	03821-05	03821-06	**RDL**	**RPD (%)**	**DF (unitless)**
Sample Collection Date	7/14/2017 00:00:00	7/14/2017 00:00:00				7/15/2017 00:00:00	7/15/2017			
Sample Matrix	SO	SO				SO	SO			
Sample Depth	0.8 - 0.8 m	0.8 - 0.8 m				0.6 - 0.6 m	0.6 - 0.6 m			
VOC										
1,1,1,2-tetrachloroethane	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
1,1,1-trichloroethane	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
1,1,2,2-tetrachloroethane	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
1,1,2-trichloroethane	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
1,1-dichloroethane	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
1,1-dichloroethene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
1,2,4-Trichlorobenzene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
1,2-dibromoethane (Ethylene Dibromide) (EDB)	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
1,2-dichlorobenzene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
1,2-dichloroethane	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
1,2-dichloroethylene (Cis) (1,2-dichloroethene)	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
1,2-dichloroethylene (Trans) (1,2-dichloroethene)	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
1,2-dichloropropane (Propylene Dichloride)	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
1,3-dichlorobenzene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
1,3-dichloropropene (Cis)	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
1,3-dichloropropene (Trans)	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
1,4-dichlorobenzene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
1-Methylnaphthalene	0.015	0.018	0.005	n/c	0.6	< 0.005		0.005	n/c	n/c
2-Butanone	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
4-Methyl-2-pentanone	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Acetone	0.8	0.6	0.5	n/c	0.4	< 0.5	< 0.5	0.5	n/c	0
Benzene	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0
Benzo[j]fluoranthene	< 0.05	< 0.05	0.05	n/c	0	< 0.05		0.05	n/c	n/c
Bromodichloromethane (BDCM)	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Bromoform (Tribromomethane)	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Bromomethane (Methyl bromide)	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Carbon Tetrachloride	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0
Chlorobenzene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Chloroethane	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Chloroform	0.07	0.05	0.05	n/c	0.4	< 0.05	< 0.05	0.05	n/c	0
Chloromethane	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Dibromochloromethane (DBCM)	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Dichloromethane (DCM) (Methylene Chloride)	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Ethylbenzene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
m,p-Xylenes	0.06	< 0.05	0.05	n/c	0.2	< 0.05	< 0.05	0.05	n/c	0
Methyl tert-Butyl Ether	< 0.1	< 0.1	0.1	n/c	0	< 0.1	< 0.1	0.1	n/c	0
o-Xylene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Styrene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Tetrachloroethylene (PCE/PERC)	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Toluene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Trichloroethylene (TCE)	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Trichlorofluoromethane (Freon 11)	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Vinyl Chloride (Chloroethene)	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Xylenes, Total	< 0.2	< 0.2	0.2	n/c	0	< 0.2	< 0.2	0.2	n/c	0

Notes:

Results are expressed in milligrams per kilogram (mg/kg), unless otherwise indicated.

m bgs = metres below ground surface

FDA = field duplicate available; FD = field duplicate

QA/QC = quality assurance/quality control

RPD = Relative percent difference; the difference between two values divided by the mean of the two values.

RPD is calculated when the mean concentration is greater than five times the detection limit.

DF = Difference factor; the absolute difference between two values divided by the method detection limit.

DF is calculated when the mean concentration is less than five times the detection limit.

NC = Not Calculated

Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 35% for RPD and 2.0 for DF.

Table K-4
Results of Soil Quality Control Analyses - Volatile Organic Carbons
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-TP17-62-SA1	K19-TP17-62-SA1	RDL	RPD (%)	DF (unitless)	K19-TP17-65-SA2	K19-TP17-65-SA2	RDL	RPD (%)	DF (unitless)
Sample Name	03823-05	03823-06				03824-08	03824-09			
Sample Collection Date	7/16/2017	7/16/2017				7/17/2017	7/17/2017			
Sample Matrix	SO	SO				SO	SO			
Sample Depth	0.6 - 0.6 m	0.6 - 0.6 m				1.5 - 1.5 m	1.5 - 1.5 m			
VOC										
1,1,1,2-tetrachloroethane	-	-	-	-	-	-	-	-	-	-
1,1,1-trichloroethane	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethene	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	-	-	-	-	-	-	-	-	-	-
1,2-dichlorobenzene	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethylene (Cis) (1,2-dichloroethene)	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethylene (Trans) (1,2-dichloroethene)	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	-	-	-	-	-	-	-	-	-	-
1,3-dichlorobenzene	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Cis)	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (Trans)	-	-	-	-	-	-	-	-	-	-
1,4-dichlorobenzene	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	0.023	0.014	0.005	n/c	1.8	< 0.005	< 0.005	0.005	n/c	0
2-Butanone	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone	-	-	-	-	-	-	-	-	-	-
Acetone	-	-	-	-	-	-	-	-	-	-
Benzene	-	-	-	-	-	-	-	-	-	-
Benzo[j]fluoranthene	0.023	0.014	0.005	n/c	1.8	< 0.05	< 0.05	0.05	n/c	0
Bromodichloromethane (BDCM)	-	-	-	-	-	-	-	-	-	-
Bromoform (Tribromomethane)	-	-	-	-	-	-	-	-	-	-
Bromomethane (Methyl bromide)	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	-	-	-	-	-	-	-	-	-	-
Chloroethane	-	-	-	-	-	-	-	-	-	-
Chloroform	-	-	-	-	-	-	-	-	-	-
Chloromethane	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane (DBCM)	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	-	-	-	-	-	-	-	-	-	-
Methyl tert-Butyl Ether	-	-	-	-	-	-	-	-	-	-
o-Xylene	-	-	-	-	-	-	-	-	-	-
Styrene	-	-	-	-	-	-	-	-	-	-
Tetrachloroethylene (PCE/PERC)	-	-	-	-	-	-	-	-	-	-
Toluene	-	-	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane (Freon 11)	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride (Chloroethene)	-	-	-	-	-	-	-	-	-	-
Xylenes, Total	-	-	-	-	-	-	-	-	-	-

Notes:

Results are expressed in milligrams per kilogram (mg/kg), unless otherwise indicated.

m bgs = metres below ground surface

FDA = field duplicate available; FD = field duplicate

QA/QC = quality assurance/quality control

RPD = Relative percent difference; the difference between two values divided by the mean of the two values.

RPD is calculated when the mean concentration is greater than five times the detection limit.

DF = Difference factor; the absolute difference between two values divided by the method detection limit.

DF is calculated when the mean concentration is less than five times the detection limit.

NC = Not Calculated

Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 35% for RPD and 2.0 for DF.

Table K-4
Results of Soil Quality Control Analyses - Volatile Organic Carbons
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-TP17-71-SA3	K19-TP17-71-SA3	RDL	RPD (%)	DF (unitless)	K19-MW17-18-SA1	K19-MW17-18-SA1	RDL	RPD (%)	DF (unitless)
Sample Name	03827-03	03827-04				03813-07	03813-08			
Sample Collection Date	7/18/2017	7/18/2017				7/18/2017	7/18/2017			
Sample Matrix	SO	SO				SO	SO			
Sample Depth	2.5 - 2.5 m	2.5 - 2.5 m				0.3 - 0.5 m	0.3 - 0.5 m			
VOC										
1,1,1,2-tetrachloroethane	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
1,1,1-trichloroethane	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
1,1,2,2-tetrachloroethane	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
1,1,2-trichloroethane	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
1,1-dichloroethane	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
1,1-dichloroethene	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
1,2,4-Trichlorobenzene	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
1,2-dibromoethane (Ethylene Dibromide) (EDB)	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
1,2-dichlorobenzene	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
1,2-dichloroethane	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
1,2-dichloroethylene (Cis) (1,2-dichloroethene)	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
1,2-dichloroethylene (Trans) (1,2-dichloroethene)	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
1,2-dichloropropane (Propylene Dichloride)	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
1,3-dichlorobenzene	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
1,3-dichloropropene (Cis)	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
1,3-dichloropropene (Trans)	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
1,4-dichlorobenzene	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
1-Methylnaphthalene	0.006	0.008	0.005	n/c	0.4	-	< 0.005	0.005	n/c	n/c
2-Butanone	< 0.5	< 0.5	0.5	n/c	0	-	< 0.5	0.5	n/c	n/c
4-Methyl-2-pentanone	< 0.5	< 0.5	0.5	n/c	0	-	< 0.5	0.5	n/c	n/c
Acetone	< 0.5	< 0.5	0.5	n/c	0	-	< 0.5	0.5	n/c	n/c
Benzene	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0
Benzo[j]fluoranthene	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
Bromodichloromethane (BDCM)	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
Bromoform (Tribromomethane)	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
Bromomethane (Methyl bromide)	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
Carbon Tetrachloride	< 0.02	< 0.02	0.02	n/c	0	-	< 0.02	0.02	n/c	n/c
Chlorobenzene	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
Chloroethane	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
Chloroform	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
Chloromethane	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
Dibromochloromethane (DBCM)	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
Dichloromethane (DCM) (Methylene Chloride)	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
Ethylbenzene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
m,p-Xylenes	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Methyl tert-Butyl Ether	< 0.1	< 0.1	0.1	n/c	0	< 0.1	< 0.1	0.1	n/c	0
o-Xylene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Styrene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Tetrachloroethylene (PCE/PERC)	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
Toluene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Trichloroethylene (TCE)	< 0.01	< 0.01	0.01	n/c	0	-	< 0.01	0.01	n/c	n/c
Trichlorofluoromethane (Freon 11)	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
Vinyl Chloride (Chloroethene)	< 0.05	< 0.05	0.05	n/c	0	-	< 0.05	0.05	n/c	n/c
Xylenes, Total	< 0.2	< 0.2	0.2	n/c	0	< 0.1	< 0.2	0.1	n/c	n/c

Notes:
Results are expressed in milligrams per kilogram (mg/kg), unless otherwise indicated.
m bgs = metres below ground surface
FDA = field duplicate available; FD = field duplicate
QA/QC = quality assurance/quality control
RPD = Relative percent difference; the difference between two values divided by the mean of the two values.
RPD is calculated when the mean concentration is greater than five times the detection limit.
DF = Difference factor; the absolute difference between two values divided by the method detection limit.
DF is calculated when the mean concentration is less than five times the detection limit.
NC = Not Calculated
Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 35% for RPD and 2.0 for DF.

Table K-4
Results of Soil Quality Control Analyses - Volatile Organic Carbons
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-MW17-26-SA3	K19-MW17-26-SA4	RDL	RPD (%)	DF (unitless)	K19-TP17-74-SA2	K19-TP17-74-SA2	RDL	RPD (%)	DF (unitless)
Sample Name	03836-08	03836-09				03828-02	03828-03			
Sample Collection Date	7/22/2017	7/22/2017				7/20/2017	7/20/2017			
Sample Matrix	SO	SO				SO	SO			
Sample Depth	3.5 - 4 m	3.5 - 4 m				1.6 - 1.6 m	1.6 - 1.6 m			
VOC										
1,1,1,2-tetrachloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,1,1-trichloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,1,2,2-tetrachloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,1,2-trichloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,1-dichloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,1-dichloroethene	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,2,4-Trichlorobenzene	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,2-dibromoethane (Ethylene Dibromide) (EDB)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,2-dichlorobenzene	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,2-dichloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,2-dichloroethylene (Cis) (1,2-dichloroethene)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,2-dichloroethylene (Trans) (1,2-dichloroethene)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,2-dichloropropane (Propylene Dichloride)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,3-dichlorobenzene	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,3-dichloropropene (Cis)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,3-dichloropropene (Trans)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,4-dichlorobenzene	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1-Methylnaphthalene	0.934	0.87	0.05	7	n/c	< 0.005	-	0.005	n/c	n/c
2-Butanone	< 0.5	-	0.5	n/c	n/c	< 0.5	-	0.5	n/c	n/c
4-Methyl-2-pentanone	< 0.5	-	0.5	n/c	n/c	< 0.5	-	0.5	n/c	n/c
Acetone	< 0.5	-	0.5	n/c	n/c	< 0.5	-	0.5	n/c	n/c
Benzene	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0
Benzo[j]fluoranthene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	-	0.05	n/c	n/c
Bromodichloromethane (BDCM)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Bromoform (Tribromomethane)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Bromomethane (Methyl bromide)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Carbon Tetrachloride	< 0.02	-	0.02	n/c	n/c	< 0.02	-	0.02	n/c	n/c
Chlorobenzene	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Chloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Chloroform	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Chloromethane	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Dibromochloromethane (DBCM)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Dichloromethane (DCM) (Methylene Chloride)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Ethylbenzene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
m,p-Xylenes	< 0.05	0.10	0.05	n/c	1	< 0.05	< 0.05	0.05	n/c	0
Methyl tert-Butyl Ether	< 0.1	< 0.1	0.1	n/c	0	< 0.1	< 0.1	0.1	n/c	0
o-Xylene	< 0.05	0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Styrene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Tetrachloroethylene (PCE/PERC)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Toluene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Trichloroethylene (TCE)	< 0.01	-	0.01	n/c	n/c	< 0.01	-	0.01	n/c	n/c
Trichlorofluoromethane (Freon 11)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Vinyl Chloride (Chloroethene)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Xylenes, Total	< 0.2	0.2	0.1	n/c	n/c	< 0.2	< 0.1	0.1	n/c	n/c

Notes:
Results are expressed in milligrams per kilogram (mg/kg), unless otherwise indicated.
m bgs = metres below ground surface
FDA = field duplicate available; FD = field duplicate
QA/QC = quality assurance/quality control
RPD = Relative percent difference; the difference between two values divided by the mean of the two values.
RPD is calculated when the mean concentration is greater than five times the detection limit.
DF = Difference factor; the absolute difference between two values divided by the method detection limit.
DF is calculated when the mean concentration is less than five times the detection limit.
NC = Not Calculated
Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 35% for RPD and 2.0 for DF.

Table K-4
Results of Soil Quality Control Analyses - Volatile Organic Carbons
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-MW17-22-SA4	K19-MW17-22-SA4				K19-TP17-82-SA2	K19-TP17-82-SA2			
Sample Name	03834-06	03834-07	**RDL**	**RPD (%)**	**DF (unitless)**	03841-02	03841-03	**RDL**	**RPD (%)**	**DF (unitless)**
Sample Collection Date	7/21/2017	7/21/2017				7/21/2017	7/21/2017			
Sample Matrix	SO	SO				SO	SO			
Sample Depth	4.5 - 5 m	4.5 - 5 m				1.4 - 1.4 m	1.4 - 1.4 m			
VOC										
1,1,1,2-tetrachloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,1,1-trichloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,1,2,2-tetrachloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,1,2-trichloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,1-dichloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,1-dichloroethene	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,2,4-Trichlorobenzene	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,2-dibromoethane (Ethylene Dibromide) (EDB)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,2-dichlorobenzene	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,2-dichloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,2-dichloroethylene (Cis) (1,2-dichloroethene)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,2-dichloroethylene (Trans) (1,2-dichloroethene)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,2-dichloropropane (Propylene Dichloride)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,3-dichlorobenzene	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,3-dichloropropene (Cis)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,3-dichloropropene (Trans)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,4-dichlorobenzene	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1-Methylnaphthalene	1.34	1.15	0.05	15	n/c	0.029	0.049	0.005	**51**	n/c
2-Butanone	< 0.5	-	0.5	n/c	n/c	< 0.5	< 0.5	0.5	n/c	0
4-Methyl-2-pentanone	< 0.5	-	0.5	n/c	n/c	< 0.5	< 0.5	0.5	n/c	0
Acetone	< 0.5	-	0.5	n/c	n/c	< 0.5	< 0.5	0.5	n/c	0
Benzene	< 0.02	-	0.02	n/c	n/c	< 0.02	< 0.02	0.02	n/c	0
Benzo[j]fluoranthene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Bromodichloromethane (BDCM)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Bromoform (Tribromomethane)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Bromomethane (Methyl bromide)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Carbon Tetrachloride	< 0.02	-	0.02	n/c	n/c	< 0.02	< 0.02	0.02	n/c	0
Chlorobenzene	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Chloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Chloroform	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Chloromethane	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Dibromochloromethane (DBCM)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Dichloromethane (DCM) (Methylene Chloride)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Ethylbenzene	0.38	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
m,p-Xylenes	1.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Methyl tert-Butyl Ether	< 0.1	-	0.1	n/c	n/c	< 0.1	< 0.1	0.1	n/c	0
o-Xylene	0.50	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Styrene	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Tetrachloroethylene (PCE/PERC)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Toluene	0.20	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Trichloroethylene (TCE)	< 0.01	-	0.01	n/c	n/c	< 0.01	< 0.01	0.01	n/c	0
Trichlorofluoromethane (Freon 11)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Vinyl Chloride (Chloroethene)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Xylenes, Total	1.6	-	0.2	n/c	n/c	< 0.2	< 0.2	0.2	n/c	0

Notes:

Results are expressed in milligrams per kilogram (mg/kg), unless otherwise indicated.

m bgs = metres below ground surface

FDA = field duplicate available; FD = field duplicate

QA/QC = quality assurance/quality control

RPD = Relative percent difference; the difference between two values divided by the mean of the two values.

RPD is calculated when the mean concentration is greater than five times the detection limit.

DF = Difference factor; the absolute difference between two values divided by the method detection limit.

DF is calculated when the mean concentration is less than five times the detection limit.

NC = Not Calculated

Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 35% for RPD and 2.0 for DF.

Table K-4
Results of Soil Quality Control Analyses - Volatile Organic Carbons
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-MW17-31-SA5	K19-MW17-31-SA5				K19-MW17-34-SA3	K19-MW17-34-SA3			
Sample Name	03839-09	03839-10	**RDL**	**RPD (%)**	**DF (unitless)**	03846-09	03846-10	**RDL**	**RPD (%)**	**DF (unitless)**
Sample Collection Date	7/26/2017	7/26/2017				7/27/2017	7/27/2017			
Sample Matrix	SO	SO				SO	SO			
Sample Depth	6.4 - 6.8 m	6.4 - 6.8 m				3.5 - 4 m	3.5 - 4 m			
VOC										
1,1,1,2-tetrachloroethane	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
1,1,1-trichloroethane	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
1,1,2,2-tetrachloroethane	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
1,1,2-trichloroethane	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
1,1-dichloroethane	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
1,1-dichloroethene	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
1,2,4-Trichlorobenzene	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
1,2-dibromoethane (Ethylene Dibromide) (EDB)	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
1,2-dichlorobenzene	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
1,2-dichloroethane	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
1,2-dichloroethylene (Cis) (1,2-dichloroethene)	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
1,2-dichloroethylene (Trans) (1,2-dichloroethene)	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
1,2-dichloropropane (Propylene Dichloride)	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
1,3-dichlorobenzene	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
1,3-dichloropropene (Cis)	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
1,3-dichloropropene (Trans)	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
1,4-dichlorobenzene	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
1-Methylnaphthalene	1.53	1.78	0.05	15	n/c	0.401	0.468	0.005	15	n/c
2-Butanone	-	-	-			< 0.5	-	0.5	n/c	n/c
4-Methyl-2-pentanone	-	-	-			< 0.5	-	0.5	n/c	n/c
Acetone	-	-	-			< 0.5	-	0.5	n/c	n/c
Benzene	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0
Benzo[j]fluoranthene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Bromodichloromethane (BDCM)	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
Bromoform (Tribromomethane)	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
Bromomethane (Methyl bromide)	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
Carbon Tetrachloride	-	-	-	-	-	< 0.02	-	0.02	n/c	n/c
Chlorobenzene	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
Chloroethane	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
Chloroform	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
Chloromethane	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
Dibromochloromethane (DBCM)	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
Dichloromethane (DCM) (Methylene Chloride)	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
Ethylbenzene	0.24	0.11	0.05	n/c	**2.6**	< 0.05	< 0.05	0.05	n/c	0
m,p-Xylenes	0.71	0.34	0.05	**70**	n/c	< 0.05	< 0.05	0.05	n/c	0
Methyl tert-Butyl Ether	< 0.1	< 0.1	0.1	n/c	0	< 0.1	< 0.1	0.1	n/c	0
o-Xylene	0.34	0.16	0.05	**72**	n/c	< 0.05	< 0.05	0.05	n/c	0
Styrene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Tetrachloroethylene (PCE/PERC)	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
Toluene	0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Trichloroethylene (TCE)	-	-	-	-	-	< 0.01	-	0.01	n/c	n/c
Trichlorofluoromethane (Freon 11)	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
Vinyl Chloride (Chloroethene)	-	-	-	-	-	< 0.05	-	0.05	n/c	n/c
Xylenes, Total	1.1	0.5	0.1	**75**	n/c	< 0.2	< 0.1	0.1	n/c	n/c

Notes:

Results are expressed in milligrams per kilogram (mg/kg), unless otherwise indicated.

m bgs = metres below ground surface

FDA = field duplicate available; FD = field duplicate

QA/QC = quality assurance/quality control

RPD = Relative percent difference; the difference between two values divided by the mean of the two values.

RPD is calculated when the mean concentration is greater than five times the detection limit.

DF = Difference factor; the absolute difference between two values divided by the method detection limit.

DF is calculated when the mean concentration is less than five times the detection limit.

NC = Not Calculated

Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 35% for RPD and 2.0 for DF.

Table K-4
Results of Soil Quality Control Analyses - Volatile Organic Carbons
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-MW17-35-SA2	K19-MW17-35-SA2	RDL	RPD (%)	DF (unitless)	K19-MW17-20-SA5	K19-MW17-20-SA5	RDL	RPD (%)	DF (unitless)
Sample Name	03847-02	03847-03				03833-05	03833-06			
Sample Collection Date	7/27/2017	7/27/2017				7/20/2017	7/20/2017			
Sample Matrix	SO	SO				SO	SO			
Sample Depth	1 - 1.5 m	1 - 1.5 m				5.8 - 6.8 m	5.8 - 6.8 m			
VOC										
1,1,1,2-tetrachloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,1,1-trichloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,1,2,2-tetrachloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,1,2-trichloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,1-dichloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,1-dichloroethene	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,2,4-Trichlorobenzene	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,2-dibromoethane (Ethylene Dibromide) (EDB)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,2-dichlorobenzene	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,2-dichloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,2-dichloroethylene (Cis) (1,2-dichloroethene)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,2-dichloroethylene (Trans) (1,2-dichloroethene)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,2-dichloropropane (Propylene Dichloride)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,3-dichlorobenzene	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,3-dichloropropene (Cis)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,3-dichloropropene (Trans)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1,4-dichlorobenzene	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
1-Methylnaphthalene	1.71	1.44	0.05	17	n/c	1.88	1.20	0.05	**44**	n/c
2-Butanone	< 0.5	-	0.5	n/c	n/c	< 0.5	-	0.5	n/c	n/c
4-Methyl-2-pentanone	< 0.5	-	0.5	n/c	n/c	< 0.5	-	0.5	n/c	n/c
Acetone	< 0.5	-	0.5	n/c	n/c	< 0.5	-	0.5	n/c	n/c
Benzene	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0
Benzo[j]fluoranthene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Bromodichloromethane (BDCM)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Bromoform (Tribromomethane)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Bromomethane (Methyl bromide)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Carbon Tetrachloride	< 0.02	-	0.02	n/c	n/c	< 0.02	-	0.02	n/c	n/c
Chlorobenzene	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Chloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Chloroform	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Chloromethane	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Dibromochloromethane (DBCM)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Dichloromethane (DCM) (Methylene Chloride)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Ethylbenzene	0.12	0.11	0.05	n/c	0.2	0.22	0.23	0.05	n/c	0.2
m,p-Xylenes	0.24	0.22	0.05	n/c	0.4	0.66	0.71	0.05	7	n/c
Methyl tert-Butyl Ether	< 0.1	< 0.1	0.1	n/c	0	< 0.1	< 0.1	0.1	n/c	0
o-Xylene	0.07	0.06	0.05	n/c	0.2	0.31	0.33	0.05	6	n/c
Styrene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Tetrachloroethylene (PCE/PERC)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Toluene	< 0.05	< 0.05	0.05	n/c	0	0.11	0.09	0.05	n/c	0.4
Trichloroethylene (TCE)	< 0.01	-	0.01	n/c	n/c	< 0.01	-	0.01	n/c	n/c
Trichlorofluoromethane (Freon 11)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Vinyl Chloride (Chloroethene)	< 0.05	-	0.05	n/c	n/c	< 0.05	-	0.05	n/c	n/c
Xylenes, Total	0.3	0.3	0.1	n/c	n/c	1.0	1.0	0.1	n/c	n/c

Notes:
Results are expressed in milligrams per kilogram (mg/kg), unless otherwise indicated.
m bgs = metres below ground surface
FDA = field duplicate available; FD = field duplicate
QA/QC = quality assurance/quality control
RPD = Relative percent difference; the difference between two values divided by the mean of the two values.
RPD is calculated when the mean concentration is greater than five times the detection limit.
DF = Difference factor; the absolute difference between two values divided by the method detection limit.
DF is calculated when the mean concentration is less than five times the detection limit.
NC = Not Calculated
Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 35% for RPD and 2.0 for DF.

Table K-4
Results of Soil Quality Control Analyses - Volatile Organic Carbons
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-MW17-35-SA6	K19-MW17-35-SA6				K19-MW17-29-SA4	K19-MW17-29-SA4			
Sample Name	03847-07	03847-08	**RDL**	**RPD (%)**	**DF (unitless)**	03838-07	03838-08	**RDL**	**RPD (%)**	**DF (unitless)**
Sample Collection Date	7/27/2017	7/27/2017				7/24/2017	7/24/2017			
Sample Matrix	SO	SO				SO	SO			
Sample Depth	4 - 4.5 m	4 - 4.5 m				3.4 - 3.7 m	3.4 - 3.7 m			
VOC										
1,1,1,2-tetrachloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,1,1-trichloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,1,2,2-tetrachloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,1,2-trichloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,1-dichloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,1-dichloroethene	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,2,4-Trichlorobenzene	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,2-dibromoethane (Ethylene Dibromide) (EDB)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,2-dichlorobenzene	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,2-dichloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,2-dichloroethylene (Cis) (1,2-dichloroethene)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,2-dichloroethylene (Trans) (1,2-dichloroethene)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,2-dichloropropane (Propylene Dichloride)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,3-dichlorobenzene	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,3-dichloropropene (Cis)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,3-dichloropropene (Trans)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1,4-dichlorobenzene	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
1-Methylnaphthalene	1.71	1.44	0.05	17	n/c	0.935	1.18	0.05	23	n/c
2-Butanone	< 0.5	-	0.5	n/c	n/c	< 0.5	< 0.5	0.5	n/c	0
4-Methyl-2-pentanone	< 0.5	-	0.5	n/c	n/c	< 0.5	< 0.5	0.5	n/c	0
Acetone	< 0.5	-	0.5	n/c	n/c	< 0.5	< 0.5	0.5	n/c	0
Benzene	< 0.02	< 0.02	0.02	n/c	0	0.05	0.08	0.02	n/c	1.5
Benzo[j]fluoranthene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Bromodichloromethane (BDCM)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Bromoform (Tribromomethane)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Bromomethane (Methyl bromide)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Carbon Tetrachloride	< 0.02	-	0.02	n/c	n/c	< 0.02	< 0.02	0.02	n/c	0
Chlorobenzene	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Chloroethane	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Chloroform	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Chloromethane	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Dibromochloromethane (DBCM)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Dichloromethane (DCM) (Methylene Chloride)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Ethylbenzene	0.12	0.11	0.05	n/c	0.2	0.08	0.14	0.05	n/c	1.2
m,p-Xylenes	0.24	0.22	0.05	n/c	0.4	0.15	0.26	0.05	**54**	n/c
Methyl tert-Butyl Ether	< 0.1	< 0.1	0.1	n/c	0	< 0.1	< 0.1	0.1	n/c	0
o-Xylene	0.07	0.06	0.05	n/c	0.2	< 0.05	< 0.05	0.05	n/c	0
Styrene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Tetrachloroethylene (PCE/PERC)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Toluene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Trichloroethylene (TCE)	< 0.01	-	0.01	n/c	n/c	< 0.01	< 0.01	0.01	n/c	0
Trichlorofluoromethane (Freon 11)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Vinyl Chloride (Chloroethene)	< 0.05	-	0.05	n/c	n/c	< 0.05	< 0.05	0.05	n/c	0
Xylenes, Total	0.3	0.3	0.1	n/c	n/c	< 0.2	0.3	0.005	**40**	n/c

Notes:
Results are expressed in milligrams per kilogram (mg/kg), unless otherwise indicated.
m bgs = metres below ground surface
FDA = field duplicate available; FD = field duplicate
QA/QC = quality assurance/quality control
RPD = Relative percent difference; the difference between two values divided by the mean of the two values.
RPD is calculated when the mean concentration is greater than five times the detection limit.
DF = Difference factor; the absolute difference between two values divided by the method detection limit.
DF is calculated when the mean concentration is less than five times the detection limit.
NC = Not Calculated
Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 35% for RPD and 2.0 for DF.

Table K-5
Results of Soil Quality Control Analyses - Glycols and Pesticides
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-TP17-74-SA2	K19-TP17-74-SA2	RDL	RPD (%)	DF (unitless)	K19-TP17-57-SA1	K19-TP17-57-SA1	RDL	RPD (%)	DF (unitless)
Sample Name	03828-02	03828-03				03821-05	03821-06			
Sample Collection Date	7/20/2017 00:00:00	7/20/2017 00:00:00				7/15/2017 00:00:00	7/15/2017 00:00:00			
Sample Matrix	SO	SO				SO	SO			
Sample Depth	1.6 - 1.6 m	1.6 - 1.6 m				0.6 - 0.6 m	0.6 - 0.6 m			
Glycols										
Diethylene Glycol	< 10	< 10	10	n/c	0	-	-	-	-	-
Ethylene Glycol	< 10	< 10	10	n/c	0	-	-	-	-	-
Propylene Glycol	< 10	< 10	10	n/c	0	-	-	-	-	-
Tetraethylene Glycol	< 10	< 10	10	n/c	0	-	-	-	-	-
Triethylene Glycol	< 10	< 10	10	n/c	0	-	-	-	-	-

Notes:

Results are expressed in milligrams per kilogram (mg/kg), unless otherwise indicated.

m bgs = metres below ground surface

FDA = field duplicate available; FD = field duplicate

QA/QC = quality assurance/quality control

RPD = Relative percent difference; the difference between two values divided by the mean of the two values.

RPD is calculated when the mean concentration is greater than five times the detection limit.

DF = Difference factor; the absolute difference between two values divided by the method detection limit.

DF is calculated when the mean concentration is less than five times the detection limit.

NC = Not Calculated

Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 35% for RPD and 2.0 for DF.

Table K-6
Results of Soil Quality Control Analyses - Leachates
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-MW17-29	K19-MW17-29				K19-TP17-70	K19-TP17-70			
Sample Name	03838-07	03838-08	RDL	RPD (%)	DF (unitless)	03826-07	03826-08	RDL	RPD (%)	DF (unitless)
Sample Collection Date	17N243343	17N243343				17N240971	17N240971			
Sample Matrix	07/24/2017	07/24/2017				07/18/2017	07/18/2017			
Sample Depth	3.4-3.7	3.4-3.7				0.5	0.5			
Leachable Non-Halogenated Volatiles										
Leachate Benzene	<0.005	<0.005	0.005	nc	nc	-	-	-	nc	nc
Leachate Toluene	0.005	<0.005	0.005	nc	nc	-	-	-	nc	nc
Leachate Ethylbenzene	<0.005	<0.005	0.005	nc	nc	-	-	-	nc	nc
Leachate m & p-Xylene	-	-	-	nc	nc	-	-	-	nc	nc
Leachate o-Xylene	-	-	-	nc	nc	-	-	-	nc	nc
Leachate Styrene	-	-	-	nc	nc	-	-	-	nc	nc
Leachate Xylenes (Total)	0.008	<0.005	0.005	nc	nc	-	-	-	nc	nc
Bromofluorobenzene (%)	91	105	na	nc	nc	-	-	-	nc	nc
Dibromofluoromethane (%)	109	110	na	nc	nc	-	-	-	nc	nc
Toluene - d8 (%)	108	108	na	nc	nc	-	-	-	nc	nc
Fluoride - Leachate (SWEP)	-	-	-	nc	nc	<0.5	<0.5	0.5	nc	nc
Nitrate - Leachate (SWEP)	-	-	-	nc	nc	<0.5	<0.5	0.5	nc	nc
Nitrite - Leachate (SWEP)	-	-	-	nc	nc	<0.5	<0.5	0.5	nc	nc
Cyanide - Leachate (SWEP)	-	-	-	nc	nc	<0.002	<0.002	0.002	nc	nc

Notes:

Results are expressed in milligrams per kilogram (mg/kg), unless otherwise indicated.

m bgs = metres below ground surface

FDA = field duplicate available; FD = field duplicate

QA/QC = quality assurance/quality control

RPD = Relative percent difference; the difference between two values divided by the mean of the two values.

RPD is calculated when the mean concentration is greater than five times the detection limit.

DF = Difference factor; the absolute difference between two values divided by the method detection limit.

DF is calculated when the mean concentration is less than five times the detection limit.

NC = Not Calculated

Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 35% for RPD and 2.0 for DF.

Table K-7
Results of Ground Water Quality Control Analyses - Metals and Inorganic Parameters
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-09MW-06	K19-09MW-06				K19-MW17-21	K19-MW17-21			
Sample Name	03830-02	03830-03	**RDL**	**RPD (%)**	**DF (unitless)**	03765-04	03765-05	**RDL**	**RPD (%)**	**DF (unitless)**
Sample Collection Date	7/16/2017	7/16/2017				7/25/2017	7/25/2017			
Sample Matrix	WG	WG				WG	WG			
Anions and Nutrients										
Chloride (Cl)	2720	2720	5	0	n/c	1.98	1.95	0.05	2	n/c
Dissolved Metals										
Aluminum	4	4	2	n/c	0	< 2	< 2	2	n/c	0
Antimony	0.4	0.4	0.2	n/c	0	< 0.2	< 0.2	0.2	n/c	0
Arsenic	0.5	0.7	0.1	**33**	n/c	0.2	0.2	0.1	n/c	0
Barium	2340	2300	0.2	2	n/c	141	135	0.2	4	n/c
Beryllium	0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Bismuth	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Boron	100	92	2	8	n/c	273	243	2	12	n/c
Cadmium	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Calcium	660000	688000	250	4	n/c	38600	38600	50	0	n/c
Chromium	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Cobalt	0.12	0.12	0.05	n/c	0	0.24	0.24	0.05	n/c	0
Copper	< 0.2	< 0.2	0.2	n/c	0	< 0.2	< 0.2	0.2	n/c	0
Hardness	2670000	2730000	100	2	n/c	176000	175000	100	1	n/c
Iron	34700	34200	10	1	n/c	707	709	10	0	n/c
Lead	3.74	3.77	0.05	1	n/c	< 0.05	< 0.05	0.05	n/c	0
Lithium	150	147	2.5	2	n/c	112	117	2.5	4	n/c
Magnesium	249000	245000	50	2	n/c	19300	19100	50	1	n/c
Manganese	1400	1390	1	1	n/c	606	606	1	0	n/c
Mercury	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Molybdenum	0.06	0.06	0.05	n/c	0	0.23	0.19	0.05	n/c	0.8
Nickel	0.3	0.2	0.2	n/c	0.5	0.4	0.4	0.2	n/c	0
Potassium	6890	6940	50	1	n/c	2350	2320	50	1	n/c
Selenium	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Silicon	6170	6110	50	1	n/c	5630	5610	50	0	n/c
Silver	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0
Sodium	452000	460000	250	2	n/c	10600	10400	50	2	n/c
Strontium	2690	2570	0.5	5	n/c	756	748	0.1	1	n/c
Sulphur (Colloidal)	11300	11000	500	3	n/c	3920	3920	500	0	n/c
Thallium	0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Tin	0.06	0.06	0.05	n/c	0	0.15	0.14	0.05	n/c	0.2
Titanium	5.2	6.0	0.5	14	n/c	1.1	1.2	0.5	n/c	0.2
Uranium	0.01	0.01	0.01	n/c	0	0.43	0.39	0.01	10	n/c
Vanadium	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Zinc	< 2	< 2	2	n/c	0	< 2	< 2	2	n/c	0
Zirconium	< 0.1	< 0.1	0.1	n/c	0	< 0.1	< 0.1	0.1	n/c	0

Notes:
Results are expressed in milligrams per litre (mg/L), unless otherwise indicated.
FDA = field duplicate available; FD = field duplicate
QA/QC = quality assurance/quality control
RPD = Relative percent difference; the difference between two values divided by the mean of the two values.
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NC = Not Calculated; NA = Not Applicable
Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 20% for RPD and 2.0 for DF.

Table K-7
Results of Ground Water Quality Control Analyses - Metals and Inorganic Parameters
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-MW16-07D	K19-MW16-07D				K19-10MW-10	K19-10MW-10			
Sample Name	03815-03	03815-04	**RDL**	**RPD (%)**	**DF (unitless)**	03816-05	03816-06	**RDL**	**RPD (%)**	**DF (unitless)**
Sample Collection Date	7/20/2017	7/20/2017				7/21/2017	7/21/2017			
Sample Matrix	WG	WG				WG	WG			
Anions and Nutrients										
Chloride (Cl)	0.45	0.45	0.05	0	n/c					
Dissolved Metals										
Aluminum	< 2	< 2	2	n/c	0	183	159	2	14	n/c
Antimony	< 0.2	< 0.2	0.2	n/c	0	< 0.2	< 0.2	0.2	n/c	0
Arsenic	0.1	0.2	0.1	n/c	1	0.7	0.5	0.1	**33**	n/c
Barium	196	194	0.2	1	n/c	652	664	2	2	n/c
Beryllium	< 0.01	< 0.01	0.01	n/c	0	0.03	0.02	0.01	n/c	1
Bismuth	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Boron	527	536	2	2	n/c	41	44	2	7	n/c
Cadmium	< 0.01	< 0.01	0.01	n/c	0	0.08	0.07	0.01	13	n/c
Calcium	3100	3060	50	1	n/c	39000	39400	50	1	n/c
Chromium	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Cobalt	< 0.05	< 0.05	0.05	n/c	0	4.10	4.24	0.05	3	n/c
Copper	< 0.2	< 0.2	0.2	n/c	0	3.2	3.2	0.2	0	n/c
Hardness	19000	18900	100	1	n/c	148000	149000	100	1	n/c
Iron	107	105	10	2	n/c	1110	1070	10	4	n/c
Lead	< 0.05	< 0.05	0.05	n/c	0	0.30	0.32	0.05	6	n/c
Lithium	184	191	2.5	4	n/c	17.6	17.6	0.5	0	n/c
Magnesium	2740	2740	50	0	n/c	12200	12200	50	0	n/c
Manganese	33	33	1	0	n/c	343	343	1	0	n/c
Mercury	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Molybdenum	< 0.05	< 0.05	0.05	n/c	0	0.24	0.26	0.05	8	n/c
Nickel	< 0.2	< 0.2	0.2	n/c	0	8.4	8.3	0.2	1	n/c
Potassium	768	751	50	2	n/c	2630	2630	50	0	n/c
Selenium	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Silicon	3250	3290	50	1	n/c	3810	3810	50	0	n/c
Silver	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0
Sodium	173000	173000	50	0	n/c	3500	3450	50	1	n/c
Strontium	91.7	95.8	0.1	4	n/c	121	116	0.1	4	n/c
Sulphur (Colloidal)	< 500	< 500	500	n/c	0	1980	1950	500	n/c	0.06
Thallium	< 0.01	< 0.01	0.01	n/c	0	0.01	< 0.01	0.01	n/c	0
Tin	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Titanium	1.4	1.4	0.5	n/c	0	6.7	5.4	0.5	**21**	n/c
Uranium	< 0.01	< 0.01	0.01	n/c	0	0.19	0.18	0.01	5	n/c
Vanadium	< 0.5	< 0.5	0.5	n/c	0	1.1	1.1	0.5	n/c	0
Zinc	< 2	< 2	2	n/c	0	10	11	2	10	n/c
Zirconium	< 0.1	< 0.1	0.1	n/c	0	1.0	1.0	0.1	0	n/c

Notes:
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Table K-7
Results of Ground Water Quality Control Analyses - Metals and Inorganic Parameters
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-MW17-24	K19-MW17-24				K19-MW17-35D	K19-MW17-35D			
Sample Name	03797-04	03797-05	**RDL**	**RPD (%)**	**DF (unitless)**	03763-01	03763-02	**RDL**	**RPD (%)**	**DF (unitless)**
Sample Collection Date	7/26/2017	7/26/2017				7/29/2017	7/29/2017			
Sample Matrix	WG	WG				WG	WG			
Anions and Nutrients										
Chloride (Cl)	0.45	0.47	0.05	4	n/c	1.84	1.83	0.05	1	n/c
Dissolved Metals										
Aluminum	< 2	< 2	2	n/c	0	6	7	2	n/c	0.5
Antimony	< 0.2	< 0.2	0.2	n/c	0	< 0.2	< 0.2	0.2	n/c	0
Arsenic	0.4	0.4	0.1	n/c	0	0.4	0.6	0.1	**40**	n/c
Barium	2040	1930	2	6	n/c	998	994	0.2	0	n/c
Beryllium	0.01	0.01	0.01	n/c	0	0.01	0.02	0.01	n/c	1
Bismuth	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Boron	128	121	2	6	n/c	55	58	2	5	n/c
Cadmium	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Calcium	34400	33500	50	3	n/c	61100	61900	50	1	n/c
Chromium	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Cobalt	0.41	0.35	0.05	16	n/c	0.45	0.46	0.05	2	n/c
Copper	< 0.2	< 0.2	0.2	n/c	0	< 0.2	< 0.2	0.2	n/c	0
Hardness	140000	138000	100	1	n/c	230000	232000	100	1	n/c
Iron	720	738	10	2	n/c	24100	24400	10	1	n/c
Lead	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Lithium	84.7	81.3	0.5	4	n/c	42.0	43.7	0.5	4	n/c
Magnesium	13100	13100	50	0	n/c	18900	18900	50	0	n/c
Manganese	301	296	1	2	n/c	233	233	1	0	n/c
Mercury	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Molybdenum	0.64	0.50	0.05	**25**	n/c	0.43	0.40	0.05	7	n/c
Nickel	1.7	1.4	0.2	19	n/c	0.7	0.7	0.2	n/c	0
Potassium	2320	2380	50	3	n/c	1480	1460	50	1	n/c
Selenium	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Silicon	3690	3530	50	4	n/c	4370	4400	50	1	n/c
Silver	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0
Sodium	62000	64100	50	3	n/c	9300	9180	50	1	n/c
Strontium	550	492	0.1	11	n/c	288	289	0.1	0	n/c
Sulphur (Colloidal)	612	566	500	n/c	0.092	6010	6200	500	3	n/c
Thallium	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Tin	0.13	0.12	0.05	n/c	0.2	0.08	0.08	0.05	n/c	0
Titanium	0.8	0.8	0.5	n/c	0	2.8	2.9	0.5	4	n/c
Uranium	0.40	0.38	0.01	5	n/c	0.23	0.22	0.01	4	n/c
Vanadium	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Zinc	< 2	< 2	2	n/c	0	< 2	< 2	2	n/c	0
Zirconium	< 0.1	< 0.1	0.1	n/c	0	< 0.1	< 0.1	0.1	n/c	0

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Table K-8
Results of Ground Water Quality Control Analyses - Petroleum Hydrocarbon Parameters
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location / **Sample Name** / **Sample Collection Date** / **Sample Matrix**	K19-09MW-06 03830-02 7/16/2017 WG	K19-09MW-06 03830-03 7/16/2017 WG	**RDL**	**RPD (%)**	**DF (unitless)**	K19-MW17-21 03765-04 7/25/2017 WG	K19-MW17-21 03765-05 7/25/2017 WG	**RDL**	**RPD (%)**	**DF (unitless)**
PAH										
1-Methylnaphthalene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
2-methylnaphthalene	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Acenaphthene	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0
Acenaphthylene	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0
Acridine	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Anthracene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Benzo(a)anthracene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Benzo(a)pyrene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Benzo(b)fluoranthene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Benzo(b,j) fluoranthene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Benzo(g,h,i)perylene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Benzo(k)fluoranthene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Chrysene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Dibenzo(a,h)anthracene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Extractable Petroleum Hydrocarbons (C10-C19)	< 100	< 100	100	n/c	0	< 100	< 100	100	n/c	0
Extractable Petroleum Hydrocarbons (C19-C32)	< 100	< 100	100	n/c	0	< 100	< 100	100	n/c	0
Fluoranthene	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0
Fluorene	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	< 100	< 100	100	n/c	0	< 100	< 100	100	n/c	0
Indeno(1,2,3-c,d)pyrene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	< 100	< 100	100	n/c	0	< 100	< 100	100	n/c	0
Naphthalene	< 0.05	< 0.05	0.05	n/c	0	0.06	0.06	0.05	n/c	0
Petroleum Hydrocarbons - F2 (C10-C16)	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	-	-	-	-	-	-	-	-	-	-
Phenanthrene	< 0.04	< 0.04	0.04	n/c	0	< 0.04	< 0.04	0.04	n/c	0
Pyrene	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0
Quinoline	< 0.1	< 0.1	0.1	n/c	0	< 0.1	< 0.1	0.1	n/c	0
Volatile Hydrocarbon Fraction	< 100	< 100	100	n/c	0	< 100	< 100	100	n/c	0
Volatile Petroleum Hydrocarbons: BTEX, VPH, LEPH & HEPH; PAH Corrected	< 100	< 100	100	n/c	0	< 100	< 100	100	n/c	0
Volatile Hydrocarbons										
Volatile Hydrocarbon Fraction	< 100	< 100	100	n/c	0	< 100	< 100	100	n/c	0
Volatile Petroleum Hydrocarbons: BTEX, VPH, LEPH & HEPH; PAH corrected	< 100	< 100	100	n/c	0	< 100	< 100	100	n/c	0

Notes:
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Table K-8
Results of Ground Water Quality Control Analyses - Petroleum Hydrocarbon Parameters
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location **Sample Name** **Sample Collection Date** **Sample Matrix**	K19-MW16-07D 03815-03 7/20/2017 WG	K19-MW16-07D 03815-04 7/20/2017 WG	**RDL**	**RPD (%)**	**DF (unitless)**	K19-10MW-10 03816-05 7/21/2017 WG	K19-10MW-10 03816-06 7/21/2017 WG	**RDL**	**RPD (%)**	**DF (unitless)**	K19-MW17-24 03797-04 7/26/2017 WG	K19-MW17-24 03797-05 7/26/2017 WG
PAH												
1-Methylnaphthalene	< 0.05	< 0.05	0.05	n/c	0	0.42	0.46	0.05	9	n/c	< 0.05	< 0.05
2-methylnaphthalene	< 0.05	< 0.05	0.05	n/c	0	0.46	0.49	0.05	6	n/c	< 0.05	< 0.05
Acenaphthene	< 0.02	< 0.02	0.02	n/c	0	0.02	0.02	0.02	n/c	0	< 0.02	< 0.02
Acenaphthylene	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02
Acridine	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0	< 0.05	< 0.05
Anthracene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01
Benzo(a)anthracene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01
Benzo(a)pyrene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01
Benzo(b)fluoranthene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01
Benzo(b,j) fluoranthene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01
Benzo(g,h,i)perylene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01
Benzo(k)fluoranthene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01
Chrysene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01
Dibenzo(a,h)anthracene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01
Extractable Petroleum Hydrocarbons (C10-C19)	< 100	< 100	100	n/c	0	-	-	-	-	-	< 100	< 100
Extractable Petroleum Hydrocarbons (C19-C32)	< 100	< 100	100	n/c	0	-	-	-	-	-	< 100	< 100
Fluoranthene	< 0.02	< 0.02	0.02	n/c	0	0.03	0.02	0.02	n/c	0.5	< 0.02	< 0.02
Fluorene	< 0.02	< 0.02	0.02	n/c	0	0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	< 100	< 100	100	n/c	0	-	-	-	-	-	< 100	< 100
Indeno(1,2,3-c,d)pyrene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	< 100	< 100	100	n/c	0	-	-	-	-	-	< 100	< 100
Naphthalene	< 0.05	< 0.05	0.05	n/c	0	0.65	0.72	0.05	10	n/c	< 0.05	< 0.05
Petroleum Hydrocarbons - F2 (C10-C16)	-	-	-	-	-	< 100	< 100	100	n/c	0	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	-	-	-	-	-	230	190	100	n/c	0.4	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	-	-	-	-	-	< 100	< 100	100	n/c	0	-	-
Phenanthrene	< 0.04	< 0.04	0.04	n/c	0	0.14	0.09	0.04	n/c	1.25	< 0.04	< 0.04
Pyrene	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0	< 0.02	< 0.02
Quinoline	< 0.1	< 0.1	0.1	n/c	0	< 0.1	< 0.1	0.1	n/c	0	< 0.1	< 0.1
Volatile Hydrocarbon Fraction	< 100	< 100	100	n/c	0	< 100	< 100	100	n/c	0	< 100	< 100
Volatile Petroleum Hydrocarbons: BTEX, VPH, LEPH & HEPH; PAH Corrected	< 100	< 100	100	n/c	0	< 100	< 100	100	n/c	0	< 100	< 100
Volatile Hydrocarbons												
Volatile Hydrocarbon Fraction	< 100	< 100	100	n/c	0	< 100	< 100	100	n/c	0	< 100	< 100
Volatile Petroleum Hydrocarbons: BTEX, VPH, LEPH & HEPH; PAH corrected	< 100	< 100	100	n/c	0	< 100	< 100	100	n/c	0	< 100	< 100

Notes:
Results are expressed in milligrams per litre (mg/L), unless otherwise indicated.

FDA = field duplicate available; FD = field duplicate
QA/QC = quality assurance/quality control
RPD = Relative percent difference; the difference between two values divided by the mean of the two values.
RPD is calculated when the mean concentration is greater than five times the detection limit.
DF = Difference factor; the absolute difference between two values divided by the method detection limit.
DF is calculated when the mean concentration is less than five times the detection limit.
NC = Not Calculated; NA = Not Applicable
Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 20% for RPD and 2.0 for DF.

Table K-8
Results of Ground Water Quality Control Analyses - Petroleum Hydrocarbon Parameters
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location Sample Name Sample Collection Date Sample Matrix	RDL	RPD (%)	DF (unitless)	K19-MW17-35D 03763-01 7/29/2017 WG	K19-MW17-35D 03763-02 7/29/2017 WG	RDL	RPD (%)	DF (unitless)
PAH								
1-Methylnaphthalene	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
2-methylnaphthalene	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Acenaphthene	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0
Acenaphthylene	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0
Acridine	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Anthracene	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Benzo(a)anthracene	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Benzo(a)pyrene	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Benzo(b)fluoranthene	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Benzo(b,j) fluoranthene	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Benzo(g,h,i)perylene	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Benzo(k)fluoranthene	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Chrysene	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Dibenzo(a,h)anthracene	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Extractable Petroleum Hydrocarbons (C10-C19)	100	n/c	0	< 100	< 100	100	n/c	0
Extractable Petroleum Hydrocarbons (C19-C32)	100	n/c	0	< 100	< 100	100	n/c	0
Fluoranthene	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0
Fluorene	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	100	n/c	0	< 100	< 100	100	n/c	0
Indeno(1,2,3-c,d)pyrene	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	100	n/c	0	< 100	< 100	100	n/c	0
Naphthalene	0.05	n/c	0	< 0.05	< 0.05	0.05	n/c	0
Petroleum Hydrocarbons - F2 (C10-C16)	-	-	-	< 100	< 100	100	n/c	0
Petroleum Hydrocarbons - F3 (C16-C34)	-	-	-	< 100	< 100	100	n/c	0
Petroleum Hydrocarbons - F4 (C34-C50)	-	-	-	< 100	< 100	100	n/c	0
Phenanthrene	0.04	n/c	0	< 0.04	< 0.04	0.04	n/c	0
Pyrene	0.02	n/c	0	< 0.02	< 0.02	0.02	n/c	0
Quinoline	0.1	n/c	0	< 0.1	< 0.1	0.1	n/c	0
Volatile Hydrocarbon Fraction	100	n/c	0	640	630	100	2	n/c
Volatile Petroleum Hydrocarbons: BTEX, VPH, LEPH & HEPH; PAH Corrected	100	n/c	0	< 100	< 100	100	n/c	0
Volatile Hydrocarbons								
Volatile Hydrocarbon Fraction	100	n/c	0	640	630	100	2	n/c
Volatile Petroleum Hydrocarbons: BTEX, VPH, LEPH & HEPH; PAH corrected	100	n/c	0	< 100	< 100	100	n/c	0

Notes:
Results are expressed in milligrams per litre (mg/L), unless otherwise indicated.

FDA = field duplicate available; FD = field duplicate
QA/QC = quality assurance/quality control
RPD = Relative percent difference; the difference between two values divided by the mean of the two values.
RPD is calculated when the mean concentration is greater than five times the detection limit.
DF = Difference factor; the absolute difference between two values divided by the method detection limit.
DF is calculated when the mean concentration is less than five times the detection limit.
NC = Not Calculated; NA = Not Applicable
Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 20% for RPD and 2.0 for DF.

Table K-9
Results of Ground Water Quality Control Analyses - Volatile Organic Carbon Parameters
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-09MW-06	K19-09MW-06				K19-MW17-21	K19-MW17-21			
Sample Name	03830-02	03830-03	**RDL**	**RPD (%)**	**DF (unitless)**	03765-04	03765-05	**RDL**	**RPD (%)**	**DF (unitless)**
Sample Collection Date	7/16/2017	7/16/2017				7/25/2017	7/25/2017			
Sample Matrix	WG	WG				WG	WG			
VOC										
1,1,1,2-tetrachloroethane	-	-	-	-	-	< 1	< 1	1	n/c	0
1,1,1-trichloroethane	-	-	-	-	-	< 1	< 1	1	n/c	0
1,1,2,2-tetrachloroethane	-	-	-	-	-	< 1	< 1	1	n/c	0
1,1,2-trichloroethane	-	-	-	-	-	< 1	< 1	1	n/c	0
1,1-dichloroethane	-	-	-	-	-	< 1	< 1	1	n/c	0
1,1-dichloroethene	-	-	-	-	-	< 1	< 1	1	n/c	0
1,2,3-Trichlorobenzene	-	-	-	-	-	< 1	< 1	1	n/c	0
1,2,4-Trichlorobenzene	-	-	-	-	-	< 1	< 1	1	n/c	0
1,2-dibromoethane (Ethylene Dibromide) (EDB)	-	-	-	-	-	< 0.3	< 0.3	0.3	n/c	0
1,2-dichlorobenzene	-	-	-	-	-	< 0.5	< 0.5	0.5	n/c	0
1,2-dichloroethane	-	-	-	-	-	< 1	< 1	1	n/c	0
1,2-dichloroethylene (cis) (1,2-dichloroethene) (cis)	-	-	-	-	-	< 1	< 1	1	n/c	0
1,2-dichloroethylene (trans) (1,2-dichloroethene) (trans)	-	-	-	-	-	< 1	< 1	1	n/c	0
1,2-dichloropropane (Propylene Dichloride)	-	-	-	-	-	< 1	< 1	1	n/c	0
1,3-dichlorobenzene	-	-	-	-	-	< 0.5	< 0.5	0.5	n/c	0
1,3-dichloropropene (cis)	-	-	-	-	-	< 1	< 1	1	n/c	0
1,3-dichloropropene (trans)	-	-	-	-	-	< 1	< 1	1	n/c	0
1,4-dichlorobenzene	-	-	-	-	-	< 0.5	< 0.5	0.5	n/c	0
2-Butanone	-	-	-	-	-	< 10	< 10	10	n/c	0
4-Methyl-2-pentanone	-	-	-	-	-	< 10	< 10	10	n/c	0
Acetone	-	-	-	-	-	< 10	< 10	10	n/c	0
Benzene	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Benzo[j]fluoranthene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Bromodichloromethane (BDCM)	-	-	-	-	-	< 1	< 1	1	n/c	0
Bromoform (Tribromomethane)	-	-	-	-	-	< 1	< 1	1	n/c	0
Bromomethane (Methyl Bromide)	-	-	-	-	-	< 1	< 1	1	n/c	0
Carbon Tetrachloride	-	-	-	-	-	< 0.5	< 0.5	0.5	n/c	0
Chlorobenzene	-	-	-	-	-	< 1	< 1	1	n/c	0
Chloroethane	-	-	-	-	-	< 1	< 1	1	n/c	0
Chloroform	-	-	-	-	-	< 1	< 1	1	n/c	0
Chloromethane	-	-	-	-	-	< 1	< 1	1	n/c	0
Dibromochloromethane (DBCM)	-	-	-	-	-	< 1	< 1	1	n/c	0
Dichlorodifluoromethane (Freon 12)	-	-	-	-	-	< 1	< 1	1	n/c	0
Dichloromethane (DCM) (Methylene Chloride)	-	-	-	-	-	< 1	< 1	1	n/c	0
Ethylbenzene	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Hexachlorobutadiene	-	-	-	-	-	< 1	< 1	1	n/c	0
m,p-Xylenes	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Methyl tert-Butyl Ether	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
o-Xylene	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Styrene	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Tetrachloroethylene (PCE/PERC)	-	-	-	-	-	< 1	< 1	1	n/c	0
Toluene	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Trichloroethylene (TCE)	-	-	-	-	-	< 1	< 1	1	n/c	0
Trichlorofluoromethane (Freon 11)	-	-	-	-	-	< 1	< 1	1	n/c	0
Trihalomethanes (Total)	-	-	-	-	-	< 2	< 2	2	n/c	0
Vinyl Chloride (Chloroethene)	-	-	-	-	-	< 1	< 1	1	n/c	0
Xylenes, Total	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0

Notes:
Results are expressed in milligrams per litre (mg/L), unless otherwise indicated.
FDA = field duplicate available; FD = field duplicate
QA/QC = quality assurance/quality control
RPD = Relative percent difference; the difference between two values divided by the mean of the two values.
RPD is calculated when the mean concentration is greater than five times the detection limit.
DF = Difference factor; the absolute difference between two values divided by the method detection limit.
DF is calculated when the mean concentration is less than five times the detection limit.
NC = Not Calculated; NA = Not Applicable
Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 20% for RPD and 2.0 for DF.

Table K-9
Results of Ground Water Quality Control Analyses - Volatile Organic Carbon Parameters
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-MW16-07D	K19-MW16-07D				K19-10MW-10	K19-10MW-10			
Sample Name	03815-03	03815-04	**RDL**	**RPD (%)**	**DF (unitless)**	03816-05	03816-06	**RDL**	**RPD (%)**	**DF (unitless)**
Sample Collection Date	7/20/2017	7/20/2017				7/21/2017	7/21/2017			
Sample Matrix	WG	WG				WG	WG			
VOC										
1,1,1,2-tetrachloroethane	-	-	-	-	-	-	-	-	-	-
1,1,1-trichloroethane	-	-	-	-	-	-	-	-	-	-
1,1,2,2-tetrachloroethane	-	-	-	-	-	-	-	-	-	-
1,1,2-trichloroethane	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethene	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	-	-	-	-	-	-	-	-	-	-
1,2-dibromoethane (Ethylene Dibromide) (EDB)	-	-	-	-	-	-	-	-	-	-
1,2-dichlorobenzene	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethane	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethylene (cis) (1,2-dichloroethene) (cis)	-	-	-	-	-	-	-	-	-	-
1,2-dichloroethylene (trans) (1,2-dichloroethene) (trans)	-	-	-	-	-	-	-	-	-	-
1,2-dichloropropane (Propylene Dichloride)	-	-	-	-	-	-	-	-	-	-
1,3-dichlorobenzene	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (cis)	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene (trans)	-	-	-	-	-	-	-	-	-	-
1,4-dichlorobenzene	-	-	-	-	-	-	-	-	-	-
2-Butanone	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone	-	-	-	-	-	-	-	-	-	-
Acetone	-	-	-	-	-	-	-	-	-	-
Benzene	< 0.5	< 0.5	0.5	n/c	0	0.7	0.8	0.5	n/c	0.2
Benzo[j]fluoranthene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Bromodichloromethane (BDCM)	-	-	-	-	-	-	-	-	-	-
Bromoform (Tribromomethane)	-	-	-	-	-	-	-	-	-	-
Bromomethane (Methyl Bromide)	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	-	-	-	-	-	-	-	-	-	-
Chloroethane	-	-	-	-	-	-	-	-	-	-
Chloroform	-	-	-	-	-	-	-	-	-	-
Chloromethane	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane (DBCM)	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane (Freon 12)	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM) (Methylene Chloride)	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Hexachlorobutadiene	-	-	-	-	-	-	-	-	-	-
m,p-Xylenes	< 0.5	< 0.5	0.5	n/c	0	1.2	1.3	0.5	n/c	0.2
Methyl tert-Butyl Ether	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
o-Xylene	< 0.5	< 0.5	0.5	n/c	0	0.8	0.7	0.5	n/c	0.2
Styrene	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Tetrachloroethylene (PCE/PERC)	-	-	-	-	-	-	-	-	-	-
Toluene	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Trichloroethylene (TCE)	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane (Freon 11)	-	-	-	-	-	-	-	-	-	-
Trihalomethanes (Total)	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride (Chloroethene)	-	-	-	-	-	-	-	-	-	-
Xylenes, Total	< 1	< 1	1	n/c	0	2	2	1	n/c	0

Notes:
Results are expressed in milligrams per litre (mg/L), unless otherwise indicated.
FDA = field duplicate available; FD = field duplicate
QA/QC = quality assurance/quality control
RPD = Relative percent difference; the difference between two values divided by the mean of the two values.
RPD is calculated when the mean concentration is greater than five times the detection limit.
DF = Difference factor; the absolute difference between two values divided by the method detection limit.
DF is calculated when the mean concentration is less than five times the detection limit.
NC = Not Calculated; NA = Not Applicable
Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 20% for RPD and 2.0 for DF.

Table K-9
Results of Ground Water Quality Control Analyses - Volatile Organic Carbon Parameters
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-MW17-24	K19-MW17-24				K19-MW17-35D	K19-MW17-35D			
Sample Name	03797-04	03797-05	**RDL**	**RPD (%)**	**DF (unitless)**	03763-01	03763-02	**RDL**	**RPD (%)**	**DF (unitless)**
Sample Collection Date	7/26/2017	7/26/2017				7/29/2017	7/29/2017			
Sample Matrix	WG	WG				WG	WG			
VOC										
1,1,1,2-tetrachloroethane	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
1,1,1-trichloroethane	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
1,1,2,2-tetrachloroethane	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
1,1,2-trichloroethane	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
1,1-dichloroethane	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
1,1-dichloroethene	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
1,2,3-Trichlorobenzene	< 1	< 1	1	n/c	0	-	-	-	-	-
1,2,4-Trichlorobenzene	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
1,2-dibromoethane (Ethylene Dibromide) (EDB)	< 0.3	< 0.3	0.3	n/c	0	< 0.3	< 0.3	0.3	n/c	0
1,2-dichlorobenzene	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
1,2-dichloroethane	< 1	< 1	1	n/c	0	121	122	1	1	n/c
1,2-dichloroethylene (cis) (1,2-dichloroethene) (cis)	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
1,2-dichloroethylene (trans) (1,2-dichloroethene) (trans)	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
1,2-dichloropropane (Propylene Dichloride)	< 1	< 1	1	n/c	0	2	2	1	n/c	0
1,3-dichlorobenzene	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
1,3-dichloropropene (cis)	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
1,3-dichloropropene (trans)	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
1,4-dichlorobenzene	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
2-Butanone	< 10	< 10	10	n/c	0	< 10	< 10	10	n/c	0
4-Methyl-2-pentanone	< 10	< 10	10	n/c	0	< 10	< 10	10	n/c	0
Acetone	< 10	< 10	10	n/c	0	< 10	< 10	10	n/c	0
Benzene	< 0.5	< 0.5	0.5	n/c	0	574	569	0.5	1	n/c
Benzo[j]fluoranthene	< 0.01	< 0.01	0.01	n/c	0	< 0.01	< 0.01	0.01	n/c	0
Bromodichloromethane (BDCM)	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
Bromoform (Tribromomethane)	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
Bromomethane (Methyl Bromide)	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
Carbon Tetrachloride	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Chlorobenzene	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
Chloroethane	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
Chloroform	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
Chloromethane	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
Dibromochloromethane (DBCM)	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
Dichlorodifluoromethane (Freon 12)	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
Dichloromethane (DCM) (Methylene Chloride)	< 1	< 1	1	n/c	0	-	-	-	-	-
Ethylbenzene	< 0.5	< 0.5	0.5	n/c	0	0.5	0.5	0.5	n/c	0
Hexachlorobutadiene	< 1	< 1	1	n/c	0	-	-	-	-	-
m,p-Xylenes	< 0.5	< 0.5	0.5	n/c	0	0.8	0.9	0.5	n/c	0.2
Methyl tert-Butyl Ether	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
o-Xylene	< 0.5	< 0.5	0.5	n/c	0	0.5	0.5	0.5	n/c	0
Styrene	< 0.5	< 0.5	0.5	n/c	0	< 0.5	< 0.5	0.5	n/c	0
Tetrachloroethylene (PCE/PERC)	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
Toluene	< 0.5	< 0.5	0.5	n/c	0	20.0	20.2	0.5	1	n/c
Trichloroethylene (TCE)	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
Trichlorofluoromethane (Freon 11)	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
Trihalomethanes (Total)	< 2	< 2	2	n/c	0	< 2	< 2	2	n/c	0
Vinyl Chloride (Chloroethene)	< 1	< 1	1	n/c	0	< 1	< 1	1	n/c	0
Xylenes, Total	< 1	< 1	1	n/c	0	1	1	1	n/c	0

Notes:
Results are expressed in milligrams per litre (mg/L), unless otherwise indicated.
FDA = field duplicate available; FD = field duplicate
QA/QC = quality assurance/quality control
RPD = Relative percent difference; the difference between two values divided by the mean of the two values.
RPD is calculated when the mean concentration is greater than five times the detection limit.
DF = Difference factor; the absolute difference between two values divided by the method detection limit.
DF is calculated when the mean concentration is less than five times the detection limit.
NC = Not Calculated; NA = Not Applicable
Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 20% for RPD and 2.0 for DF.

Table K-10
Results of Surface Water Quality Control Analyses - Metals and Inorganic Parameters
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-SW17-05	K19-SW17-05	RDL	RPD (%)	DF (unitless)
Sample Name	03814-05	03814-06			
Sample Collection Date	7/19/2017	7/19/2017			
Sample Matrix	WS	WS			
Anions and Nutrients					
Chloride (Cl)	0.06	0.06	0.05	n/c	0
Dissolved Metals					
Aluminum	698	608	2	14	n/c
Antimony	< 0.2	< 0.2	0.2	n/c	0
Arsenic	0.3	0.7	0.1	**80**	n/c
Barium	108	76.1	0.2	**35**	n/c
Beryllium	0.07	0.08	0.01	13	n/c
Bismuth	< 0.05	< 0.05	0.05	n/c	0
Boron	8	8	2	n/c	0
Cadmium	0.11	0.10	0.01	10	n/c
Calcium	6180	6180	50	0	n/c
Chromium	1.0	1.0	0.5	n/c	0
Cobalt	0.78	0.77	0.05	1	n/c
Copper	8.2	7.6	0.2	8	n/c
Hardness	22000	22000	100	0	n/c
Iron	801	805	10	0	n/c
Lead	0.53	0.49	0.05	8	n/c
Lithium	3.0	2.8	0.5	7	n/c
Magnesium	1600	1600	50	0	n/c
Manganese	30	30	1	0	n/c
Mercury	0.04	0.04	0.01	n/c	0
Molybdenum	0.12	0.10	0.05	n/c	0.4
Nickel	5.2	5.1	0.2	2	n/c
Potassium	1140	1090	50	4	n/c
Selenium	< 0.5	< 0.5	0.5	n/c	0
Silicon	2700	2600	50	4	n/c
Silver	0.04	< 0.02	0.02	n/c	1
Sodium	567	551	50	3	n/c
Strontium	20.6	19.0	0.1	8	n/c
Sulphur (Colloidal)	879	926	500	n/c	0.094
Thallium	< 0.01	< 0.01	0.01	n/c	0
Tin	0.16	0.07	0.05	n/c	1.8
Titanium	7.5	4.9	0.5	**42**	n/c
Uranium	0.19	0.20	0.01	5	n/c
Vanadium	1.2	0.9	0.5	n/c	0.6
Zinc	8	6	2	n/c	1
Zirconium	2.0	1.9	0.1	5	n/c
Total Metals					
Aluminum	2240	2080	5	7	n/c
Antimony	< 0.5	< 0.5	0.5	n/c	0
Arsenic	0.9	0.9	0.1	0	n/c
Barium	112	108	0.5	4	n/c
Beryllium	0.13	0.13	0.05	n/c	0
Boron	12	13	5	n/c	0.2
Cadmium	0.14	0.13	0.01	7	n/c
Calcium	6830	6830	50	0	n/c
Chromium	2.8	2.6	0.5	7	n/c
Cobalt	1.29	1.30	0.05	1	n/c
Copper	8.2	11.9	0.5	**37**	n/c
Hardness	24900	24700	100	1	n/c
Iron	1990	1790	10	11	n/c
Lead	1.15	1.11	0.05	4	n/c
Lithium	3.9	4.2	0.5	7	n/c
Magnesium	1910	1860	50	3	n/c
Manganese	42	40	1	5	n/c
Mercury	0.04	0.02	0.01	n/c	**2**
Molybdenum	0.2	0.2	0.1	n/c	0
Nickel	7.2	6.6	0.5	9	n/c
Potassium	1410	1390	100	1	n/c
Selenium	0.7	0.7	0.5	n/c	0
Silver	0.03	0.03	0.02	n/c	0
Sodium	643	671	100	4	n/c
Thallium	0.03	0.03	0.02	n/c	0
Titanium	12	13	1	8	n/c
Uranium	0.28	0.26	0.01	7	n/c
Vanadium	5	5	1	n/c	0
Zinc	12	16	5	n/c	0.8

Notes:
Results are expressed in milligrams per litre (mg/L), unless otherwise indicated.
FDA = field duplicate available; FD = field duplicate
QA/QC = quality assurance/quality control
RPD = Relative percent difference; the difference between two values divided by the mean of the two values.
RPD is calculated when the mean concentration is greater than five times the detection limit.
DF = Difference factor; the absolute difference between two values divided by the method detection limit.
DF is calculated when the mean concentration is less than five times the detection limit.
NC = Not Calculated; NA = Not Applicable
Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 20% for RPD and 2.0 for DF.

Table K-11
Results of Ground Water Quality Control Analyses - Petroleum Hydrocarbon Parameters
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-SW17-05	K19-SW17-05	RDL	RPD (%)	DF (unitless)
Sample Name	03814-05	03814-06			
Sample Collection Date	7/19/2017	7/19/2017			
Sample Matrix	WS	WS			
PAH					
1-Methylnaphthalene	< 0.05	< 0.05	0.05	n/c	0
2-methylnaphthalene	< 0.05	< 0.05	0.05	n/c	0
Acenaphthene	< 0.02	< 0.02	0.02	n/c	0
Acenaphthylene	< 0.02	< 0.02	0.02	n/c	0
Acridine	< 0.05	< 0.05	0.05	n/c	0
Anthracene	< 0.01	< 0.01	0.01	n/c	0
Benzo(a)anthracene	< 0.01	< 0.01	0.01	n/c	0
Benzo(a)pyrene	< 0.01	< 0.01	0.01	n/c	0
Benzo(b)fluoranthene	< 0.01	< 0.01	0.01	n/c	0
Benzo(b,j) fluoranthene	< 0.01	< 0.01	0.01	n/c	0
Benzo(g,h,i)perylene	< 0.01	< 0.01	0.01	n/c	0
Benzo(k)fluoranthene	< 0.01	< 0.01	0.01	n/c	0
Chrysene	< 0.01	< 0.01	0.01	n/c	0
Dibenzo(a,h)anthracene	< 0.01	< 0.01	0.01	n/c	0
Extractable Petroleum Hydrocarbons (C10-C19)	< 100	< 100	100	n/c	0
Extractable Petroleum Hydrocarbons (C19-C32)	170	180	100	n/c	0.1
Fluoranthene	0.02	0.03	0.02	n/c	0.5
Fluorene	0.02	0.02	0.02	n/c	0
Heavy Extractable Petroleum Hydrocarbons (BC Guidelines)	170	180	100	n/c	0.1
Indeno(1,2,3-c,d)pyrene	< 0.01	< 0.01	0.01	n/c	0
Light Extractable Petroleum Hydrocarbons (BC Guidelines)	< 100	< 100	100	n/c	0
Naphthalene	< 0.05	< 0.05	0.05	n/c	0
Petroleum Hydrocarbons - F1 (C6-C10)	< 100	< 100	100	n/c	0
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	< 100	< 100	100	n/c	0
Petroleum Hydrocarbons - F2 (C10-C16)	< 100	< 100	100	n/c	0
Petroleum Hydrocarbons - F3 (C16-C34)	250	240	100	n/c	0.1
Petroleum Hydrocarbons - F4 (C34-C50)	< 100	< 100	100	n/c	0
Phenanthrene	0.14	0.18	0.04	n/c	1
Pyrene	< 0.02	0.02	0.02	n/c	0
Quinoline	< 0.1	< 0.1	0.1	n/c	0
Volatile Hydrocarbon Fraction	< 100	< 100	100	n/c	0
Volatile Petroleum Hydrocarbons: BTEX, VPH, LEPH & HEPH; PAH Corrected	< 100	< 100	100	n/c	0
Volatile Hydrocarbons					
Volatile Hydrocarbon Fraction	< 100	< 100	100	n/c	0
Volatile Petroleum Hydrocarbons: BTEX, VPH, LEPH & HEPH;	< 100	< 100	100	n/c	0

Notes:

Results are expressed in milligrams per litre (mg/L), unless otherwise indicated.

FDA = field duplicate available; FD = field duplicate

QA/QC = quality assurance/quality control

RPD = Relative percent difference; the difference between two values divided by the mean of the two values.

RPD is calculated when the mean concentration is greater than five times the detection limit.

DF = Difference factor; the absolute difference between two values divided by the method detection limit.

DF is calculated when the mean concentration is less than five times the detection limit.

NC = Not Calculated; NA = Not Applicable

Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 20% for RPD and 2.0 for DF.

Table K-12
Results of Ground Water Quality Control Analyses - Volatile Organic Carbon Parameters
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-SW17-05	K19-SW17-05	RDL	RPD (%)	DF (unitless)
Sample Name	03814-05	03814-06			
Sample Collection Date	7/19/2017	7/19/2017			
Sample Matrix	WS	WS			
VOC					
1,1,1,2-tetrachloroethane	< 1	< 1	1	n/c	0
1,1,1-trichloroethane	< 1	< 1	1	n/c	0
1,1,2,2-tetrachloroethane	< 1	< 1	1	n/c	0
1,1,2-trichloroethane	< 1	< 1	1	n/c	0
1,1-dichloroethane	< 1	< 1	1	n/c	0
1,1-dichloroethene	< 1	< 1	1	n/c	0
1,2,3-Trichlorobenzene	< 1	< 1	1	n/c	0
1,2,4-Trichlorobenzene	< 1	< 1	1	n/c	0
1,2-dibromoethane (Ethylene Dibromide) (EDB)	< 0.3	< 0.3	0.3	n/c	0
1,2-dichlorobenzene	< 0.5	< 0.5	0.5	n/c	0
1,2-dichloroethane	< 1	< 1	1	n/c	0
1,2-dichloroethylene (cis) (1,2-dichloroethene) (cis)	< 1	< 1	1	n/c	0
1,2-dichloroethylene (trans) (1,2-dichloroethene) (trans)	< 1	< 1	1	n/c	0
1,2-dichloropropane (Propylene Dichloride)	< 1	< 1	1	n/c	0
1,3-dichlorobenzene	< 0.5	< 0.5	0.5	n/c	0
1,3-dichloropropene (cis)	< 1	< 1	1	n/c	0
1,3-dichloropropene (trans)	< 1	< 1	1	n/c	0
1,4-dichlorobenzene	< 0.5	< 0.5	0.5	n/c	0
2-Butanone	< 10	< 10	10	n/c	0
4-Methyl-2-pentanone	< 10	< 10	10	n/c	0
Acetone	< 10	< 10	10	n/c	0
Benzene	< 0.5	< 0.5	0.5	n/c	0
Benzo[j]fluoranthene	< 0.01	< 0.01	0.01	n/c	0
Bromodichloromethane (BDCM)	< 1	< 1	1	n/c	0
Bromoform (Tribromomethane)	< 1	< 1	1	n/c	0
Bromomethane (Methyl Bromide)	< 1	< 1	1	n/c	0
Carbon Tetrachloride	< 0.5	< 0.5	0.5	n/c	0
Chlorobenzene	< 1	< 1	1	n/c	0
Chloroethane	< 1	< 1	1	n/c	0
Chloroform	< 1	< 1	1	n/c	0
Chloromethane	< 1	< 1	1	n/c	0
Dibromochloromethane (DBCM)	< 1	< 1	1	n/c	0
Dichlorodifluoromethane (Freon 12)	< 1	< 1	1	n/c	0
Dichloromethane (DCM) (Methylene Chloride)	< 1	< 1	1	n/c	0
Ethylbenzene	< 0.5	< 0.5	0.5	n/c	0
Hexachlorobutadiene	< 1	< 1	1	n/c	0
m,p-Xylenes	< 0.5	< 0.5	0.5	n/c	0
Methyl tert-Butyl Ether	< 1	< 1	1	n/c	0
o-Xylene	< 0.5	< 0.5	0.5	n/c	0
Styrene	< 0.5	< 0.5	0.5	n/c	0
Tetrachloroethylene (PCE/PERC)	< 1	< 1	1	n/c	0
Toluene	< 0.5	< 0.5	0.5	n/c	0
Trichloroethylene (TCE)	< 1	< 1	1	n/c	0
Trichlorofluoromethane (Freon 11)	< 1	< 1	1	n/c	0
Trihalomethanes (Total)	< 2	< 2	2	n/c	0
Vinyl Chloride (Chloroethene)	< 1	< 1	1	n/c	0
Xylenes, Total	< 1	< 1	1	n/c	0

Notes:

Results are expressed in milligrams per litre (mg/L), unless otherwise indicated.

FDA = field duplicate available; FD = field duplicate

QA/QC = quality assurance/quality control

RPD = Relative percent difference; the difference between two values divided by the mean of the two values.

RPD is calculated when the mean concentration is greater than five times the detection limit.

DF = Difference factor; the absolute difference between two values divided by the method detection limit.

DF is calculated when the mean concentration is less than five times the detection limit.

NC = Not Calculated; NA = Not Applicable

Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 20% for RPD and 2.0 for DF.

Table K-13
Results of Ground Water Quality Control Analyses - Glycol Parameters
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-SW17-05	K19-SW17-05	RDL	RPD (%)	DF (unitless)
Sample Name	03814-05	03814-06			
Sample Collection Date	7/19/2017	7/19/2017			
Sample Matrix	WS	WS			
BC Groundwater: Glycols					
Diethylene Glycol	< 5	< 5	5	n/c	0
Ethylene Glycol	< 10	< 10	10	n/c	0
Propylene Glycol	< 10	< 10	10	n/c	0
Tetraethylene Glycol	< 10	< 10	10	n/c	0
Triethylene Glycol	< 10	< 10	10	n/c	0

Notes:

Results are expressed in milligrams per litre (mg/L), unless otherwise indicated.

FDA = field duplicate available; FD = field duplicate

QA/QC = quality assurance/quality control

RPD = Relative percent difference; the difference between two values divided by the mean of the two values.

RPD is calculated when the mean concentration is greater than five times the detection limit.

DF = Difference factor; the absolute difference between two values divided by the method detection limit.

DF is calculated when the mean concentration is less than five times the detection limit.

NC = Not Calculated; NA = Not Applicable

Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 20% for RPD and 2.0 for DF.

Table K-14
Results of Sediment Quality Control Analyses - Metals and Inorganic Parameters
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-SS17-05	K19-SS17-05	RDL	RPD (%)	DF (unitless)
SCN	03813-05	03813-06			
Sample Collection Date	7/18/2017	7/18/2017			
Sample Matrix	SS	SS			
Physical Parameters					
pH	5.28	5.42	0.05	3	n/c
Organic Carbon					
Total Organic Carbon (%)	21.9	14.5	0.02	**41**	n/c
Saturated Paste					
Chloride (in extract) (mg/L)	7	6	2	n/c	0.5
Sodium (in extract) (mg/L)	3	2	2	n/c	0.5
Chloride	12	6	2	**67**	n/c
Sodium	5	2	2	n/c	1.5
Metals					
Aluminum	18300	21300	10	15	n/c
Antimony	0.4	0.5	0.1	n/c	1
Arsenic	4.7	6.3	0.1	29	n/c
Barium	640	591	0.5	8	n/c
Beryllium	1.0	1.0	0.1	0	n/c
Bismuth	< 0.5	< 0.5	0.5	n/c	0
Cadmium	0.65	0.72	0.01	10	n/c
Calcium	10900	11600	10	6	n/c
Chromium	25	24	1	4	n/c
Cobalt	5.7	8.3	0.1	**37**	n/c
Copper	21.1	20.5	0.2	3	n/c
Iron	20100	26200	10	26	n/c
Lead	11.5	10.1	0.1	13	n/c
Lithium	13.3	14.7	0.5	10	n/c
Magnesium	3100	4030	10	26	n/c
Manganese	70	180	1	**88**	n/c
Mercury	0.10	0.07	0.01	35	n/c
Molybdenum	1.3	1.5	0.2	14	n/c
Nickel	28.4	32.0	0.5	12	n/c
Phosphorus	1480	1700	5	14	n/c
Potassium	1640	1860	5	13	n/c
Selenium	2.2	2.9	0.1	27	n/c
Silver	< 0.5	< 0.5	0.5	n/c	0
Strontium	50	45	1	11	n/c
Thallium	0.2	0.2	0.1	n/c	0
Tin	0.5	0.5	0.2	n/c	0
Titanium	55	52	1	n/c	n/c
Uranium	5.1	6.6	0.2	26	n/c
Vanadium	51	50	1	2	n/c
Zinc	40	46	1	14	n/c
Zirconium	1.8	1.5	0.1	18	n/c

Notes:
Results are expressed in milligrams per kilogram (mg/kg), unless otherwise indicated.
m bgs = metres below ground surface
FDA = field duplicate available; FD = field duplicate
QA/QC = quality assurance/quality control
RPD = Relative percent difference; the difference between two values divided by the mean of the two values.
RPD is calculated when the mean concentration is greater than five times the detection limit.
DF = Difference factor; the absolute difference between two values divided by the method detection limit.
DF is calculated when the mean concentration is less than five times the detection limit.
NC = Not Calculated
Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 35% for RPD and 2.0 for DF.

Table K-15
Results of Sediment Quality Control Analyses - Petroleum Hydrocarbon Parameters
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-SS17-05	K19-SS17-05	RDL	RPD (%)	DF (unitless)
SCN	03813-05	03813-06			
Sample Collection Date	7/18/2017	7/18/2017			
Sample Matrix	SS	SS			
PAH					
Acenaphthene	< *0.01*	< *0.01*	0.01	n/c	0
Acenaphthylene	< *0.01*	< *0.01*	0.01	n/c	0
Anthracene	< 0.008	< 0.008	0.008	n/c	0
Benzo(a)anthracene	< *0.06*	< *0.06*	0.06	n/c	0
Benzo(a)pyrene	< *0.06*	< *0.06*	0.06	n/c	0
Benzo(b)fluoranthene	< 0.1	< 0.1	0.1	n/c	0
Benzo(b,j) fluoranthene	< 0.05	< 0.05	0.05	n/c	0
Benzo[j]fluoranthene	< 0.1	< 0.1	0.1	n/c	0
Benzo(g,h,i)perylene	< 0.1	< 0.1	0.1	n/c	0
Benzo(k)fluoranthene	< 0.1	< 0.1	0.1	n/c	0
Chrysene	< *0.1*	< *0.1*	0.1	n/c	0
Dibenzo(a,h)anthracene	< *0.01*	< *0.01*	0.01	n/c	0
Fluoranthene	< 0.02	< 0.02	0.02	n/c	0
Fluorene	< *0.04*	< *0.04*	0.04	n/c	0
Indeno(1,2,3-c,d)pyrene	< 0.04	< 0.04	0.04	n/c	0
Naphthalene	< 0.01	< 0.01	0.01	n/c	0
Phenanthrene	< 0.04	< 0.04	0.04	n/c	0
Pyrene	< 0.02	< 0.02	0.02	n/c	0
Quinoline	< 0.1	< 0.1	0.1	n/c	0
1-Methylnaphthalene	0.01	< 0.01	0.01	n/c	0
2-methylnaphthalene	< 0.01	< 0.01	0.01	n/c	0
Benzo(a)pyrene Total Potency Equivalence (TPE)	< 0.1	< 0.1	0.1	n/c	0
Index of Additive Cancer Risk (IACR)	< 1	< 1	1	n/c	0
Extractable Hydrocarbons					
EPH (C10-C19)	< 40	< 40	40	n/c	0
LEPH (C10-C19) Less PAHs	< 40	< 40	40	n/c	0
EPH (C19-C32)	74	< 40	40	n/c	0.85
HEPH (C19-C32) Less PAHs	74	< 40	40	n/c	n/c
Volatile Hydrocarbons					
Benzene	< 0.06	< 0.04	0.04	n/c	n/c
Toluene	< 0.2	< 0.1	0.1	n/c	n/c
Ethylbenzene	< 0.2	< 0.1	0.1	n/c	n/c
Methyl tert-Butyl Ether	< 0.3	< 0.2	0.2	n/c	n/c
Styrene	< 0.2	< 0.1	0.1	n/c	n/c
o-Xylene	< 0.2	< 0.1	0.1	n/c	n/c
m,p-Xylenes	< 0.2	< 0.1	0.1	n/c	n/c
Xylenes, Total	< 0.2	< 0.2	0.2	n/c	n/c
Volatile Hydrocarbon Fraction	< 30	< 20	20	n/c	n/c
Volatile Petroleum Hydrocarbons	< 30	< 20	30	n/c	n/c

Notes:

Results are expressed in milligrams per kilogram (mg/kg), unless otherwise indicated.

m bgs = metres below ground surface

FDA = field duplicate available; FD = field duplicate

QA/QC = quality assurance/quality control

RPD = Relative percent difference; the difference between two values divided by the mean of the two values.

RPD is calculated when the mean concentration is greater than five times the detection limit.

DF = Difference factor; the absolute difference between two values divided by the method detection limit.

DF is calculated when the mean concentration is less than five times the detection limit.

NC = Not Calculated

Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines of 35% for RPD and 2.0 for DF.

Table K-16
Results of Sediment Quality Control Analyses - Volatile Organic Carbon Parameters
K19 - Trutch Former Townsite
Alaska Highway, BC

Sample Location	K19-SS17-05	K19-SS17-05	RDL	RPD (%)	DF (unitless)
Sample Name	03813-05	03813-06			
Sample Collection Date	7/18/2017	7/18/2017			
Sample Matrix	SS	SS			
VOCs					
Acetone	< 2	< 1	1	n/c	1
2-Butanone	< 2	< 1	1	n/c	1
Bromodichloromethane (BDCM)	< 0.2	< 0.1	0.1	n/c	1
Bromomethane (Methyl bromide)	< 0.2	< 0.1	0.1	n/c	1
Bromoform (Tribromomethane)	< 0.2	< 0.1	0.1	n/c	1
Carbon Tetrachloride	< 0.06	< 0.04	0.04	n/c	0.5
Chlorobenzene	< 0.2	< 0.1	0.1	n/c	1
Chloroethane	< 0.2	< 0.1	0.1	n/c	1
Chloroform	< 0.2	< 0.1	0.1	n/c	1
Chloromethane	< 0.2	< 0.1	0.1	n/c	1
Dichloromethane (DCM) (Methylene Chloride)	< 0.2	< 0.1	0.1	n/c	1
Dibromochloromethane (DBCM)	< 0.2	< 0.1	0.1	n/c	1
1,2-dibromoethane (Ethylene Dibromide) (EDB)	< 0.2	< 0.1	0.1	n/c	1
1,2-dichlorobenzene	< 0.2	< 0.1	0.1	n/c	1
1,3-dichlorobenzene	< 0.2	< 0.1	0.1	n/c	1
1,4-dichlorobenzene	< 0.2	< 0.1	0.1	n/c	1
1,1-dichloroethane	< 0.2	< 0.1	0.1	n/c	1
1,2-dichloroethane	< 0.2	< 0.1	0.1	n/c	1
1,1-dichloroethene	< 0.2	< 0.1	0.1	n/c	1
1,2-dichloroethylene (Cis) (1,2-dichloroethene)	< 0.2	< 0.1	0.1	n/c	1
1,2-dichloroethylene (Trans) (1,2-dichloroethene)	< 0.2	< 0.1	0.1	n/c	1
1,2-dichloropropane (Propylene Dichloride)	< 0.2	< 0.1	0.1	n/c	1
1,3-dichloropropene (Cis)	< 0.2	< 0.1	0.1	n/c	1
1,3-dichloropropene (Trans)	< 0.2	< 0.1	0.1	n/c	1
4-Methyl-2-pentanone	< 2	< 1	1	n/c	1
1,1,1,2-tetrachloroethane	< 0.2	< 0.1	0.1	n/c	1
1,1,2,2-tetrachloroethane	< 0.2	< 0.1	0.1	n/c	1
Tetrachloroethylene (PCE/PERC)	< 0.2	< 0.1	0.1	n/c	1
1,2,4-Trichlorobenzene	< 0.2	< 0.1	0.1	n/c	1
1,1,1-trichloroethane	< 0.2	< 0.1	0.1	n/c	1
1,1,2-trichloroethane	< 0.2	< 0.1	0.1	n/c	1
Trichloroethylene (TCE)	< 0.03	< 0.02	0.02	n/c	0.5
Trichlorofluoromethane (Freon 11)	< 0.2	< 0.1	0.1	n/c	1
Vinyl Chloride (Chloroethene)	< 0.2	< 0.1	0.1	n/c	1

Notes:

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