TECHNICAL SPECIFICATIONS

END OF SECTION

DIVISION 01 – GENERAL REQUIREMENTS

Part 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises completion of the Site works associated with removal of asbestos-containing building material debris and the soil remediation of the former Sayisi Dene Village Site located in Churchill, Manitoba; and further identified as the Work. The Work includes, but is not limited to, the following: Mobilization and demobilization to Site; Site preparation; abatement of asbestos-containing building materials debris; non-hazardous debris removal; removal and off-site disposal of existing coal piles; management, excavation and off-site disposal of petroleum hydrocarbon, polycyclic aromatic hydrocarbon, volatile organic compound and metal contaminated soil; backfilling excavation areas with clean fill; and Site restoration.

.2 The scope of Work is detailed within the Remedial Action Plan, Former Sayisi Dene Village, Churchill, Manitoba dated March 2021.

.3 The project is identified as PSPC Project Number R.089501.

1.2 CONTRACT METHOD

.1 Construct Work under Bid and Acceptance Form – Combined Lump Sum and Unit Price Contract.

1.3 COST BREAKDOWN

.1 Within forty-eight (48) hours of acceptance of Bid, furnish a cost breakdown by Section aggregating contract price, including lump sum portion of the price.

.2 Within forty-eight (48) hours of acceptance of Bid, submit a list of Subcontractors.

1.4 SUBMITTALS

.1 Submit in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit Project construction progress schedule in accordance with Section 01 32 16.19 – Construction Progress Schedule – Bar (GANTT) Chart.

.3 Sustainable Design Submittals:

.1 Construction Waste Management:

.1 Submit project Waste Management Plan highlighting recycling and salvage requirements; and

.2 Submit calculations on end-of-project recycling rates, salvage rates and landfill rates demonstrating percentage of construction wastes recycled or salvaged.

.4 Submit Site-specific and Work Plan Health and Safety Plan in accordance with Section 01 35 29.06 – Health and Safety Requirements.

1.5 EXISTING SERVICES

.1 The Site does not have municipal or sanitary services. Overhead electrical lines are located along the roadway on the east side of the Site.

.2 Where unknown services are encountered, immediately advise the Departmental Representative and confirm findings in writing.

.3 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.

.4 Record locations of maintained, re-routed and abandoned service lines.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 GENERAL

1.1 MINIMUM STANDARDS

.1 Rules and regulations of authorities having jurisdiction.

.2 Manitoba Workplace Safety and Health Act (C.C.S.M. cW210) and Regulation (MR 217/2016) as amended and municipal statutes and authorities.

.3 Criteria for Acceptance of Contaminated Soil at Waste Disposal Grounds (Manitoba Conservation and Climate Guideline, June 2016).

.4 CCME (Canadian Council of Ministers of the Environment) Contaminated Sites, Contaminated Soil and Groundwater and Remediation of Contaminated Sites most current publications.

.5 Canadian Environmental Protection Act (New Substance Notification Regulations).

.6 Canadian Environmental Assessment Act.

.7 Transportation of Dangerous Goods Act.

.8 Fisheries Act.

.9 Migratory Birds Convention Act.

.10 Migratory Birds Regulations.

1.2 AUTHORITIES HAVING JURISDICTION

.1 Public Services and Procurement Canada on behalf of the Government of Canada is the authority having jurisdiction over this project.

.2 All Work areas are within lands owned by the Government of Canada.

1.3 ROAD LOAD RESTRICTIONS

.1 Comply with posted restrictions. Acquire and submit to Departmental Representative copies of all necessary permits.

1.4 TAXES

.1 Pay applicable Federal, Provincial and Municipal taxes.

1.5 FEES, PERMITS, CERTIFICATES AND LETTERS

.1 Provide authorities having jurisdiction with information requested.

.2 Pay fees and obtain certificates, permits and letters required.

.3 Furnish certificates, permits and letters when requested.

1.6 EXAMINATION

.1 Attend an on-site kick off meeting with Departmental Representative.

.2 Examine existing conditions and determine conditions affecting Work.

.3 Notify Departmental Representatives in writing of any discrepancies between Contract Documents and Site conditions.

1.7 DOCUMENTS

.1 Keep on Site one (1) copy of each of the following:

- .1 Contract Drawings;
- .2 Specifications;
- .3 Amendments and addenda;
- .4 Health and Safety Plan;
- .5 Environmental Protection Plan;
- .6 Change orders;
- .7 Reviewed Shop Drawings, product data and samples;
- .8 Other modifications to Contract;
- .9 Copy of approved Work schedule;
- .10 Field test records;
- .11 Inspection certificates;
- .12 Manufacturer's certificates;
- .13 Manufacturers' installation and application instructions;
- .14 Safety Data Sheets; and
- .15 All applicable permits:
  - .1 Specifications shall govern over Drawings;
  - .2 Maintain documents in clean, dry, legible condition; and
  - .3 Make documents available at all times for inspection by Departmental Representative.

1.8 ELECTRONIC SUBMITTALS

.1 Submit electronic format copies for each type and format of submittal. Forward PDF, MS Word, MS Excel, MS Project and AutoCAD Drawing (or GIS) files; on disc compatible with PWGSC encryption requirements or through email or alternate electronic file sharing service such as ftp, as directed by Departmental Representative.

.2 Comply with Section 01 33 00 – Submittal Procedures.

1.9 CONSTRUCTION PHOTOGRAPHS

.1 Submit electronic copy of colour digital photography in jpg format, standard resolution.

.2 Identification: name and number of project and date of exposure indicated.

.3 Number of viewpoints and location of viewpoints determined by Departmental Representative.

.4 Frequency:

.1 Before the Site construction commences;

.2 At completion of excavation for soil remediation and abatement activities; and

.3 At final restoration, and as directed by Department Representative.

.5 Photograph Site works to demonstrate compliance with the mitigation measures as outlined in Appendix E.

1.10 PROTECTION

.1 Protect existing Work from damage.

.2 Replace damaged existing Work with material and finish to match original.

.3 Protect existing trees and plants on Site and adjacent properties.

.4 Protect existing active utilities and infrastructure from damage as indicated on the Drawings.

.5 Protect areas that are not within Work area. The Work area is indicated on Drawing C-02.

.6 Repair any damage to areas resulting from the execution of the Work.

1.11 EXISTING SERVICES

.1 Establish location, protect and maintain existing utility lines.

.2 Provide sanitary facilities.

.3 Provide potable water, as required.

1.12 TEMPORARY FACILITIES AND SERVICES

.1 Provide and maintain temporary facilities, including sanitary facilities and services required to carry out Work, in accordance with governing regulations and ordinances.

.2 Post notices and take precautions as required by local health authorities.

.3 Remove temporary facilities and services on completion of Work.

.4 Departmental Representative to have access to temporary facilities as required (e.g., washroom).

1.13 MATERIAL AND EQUIPMENT

.1 Use new products unless otherwise specified.

.2 Deliver and store material and equipment to manufacturer's instructions with manufacturer's labels and seals intact.

.3 When material or equipment is specified by standard or performance specifications, upon request of Departmental Representative, obtain from manufacturer an independent testing laboratory report, stating that material or equipment meets or exceeds specified requirements.

1.14 ALTERATIONS TO EXISTING SITE

.1 Not Used.

1.15 INSPECTION AND TESTING

.1 When initial tests and inspections reveal Work not to Contract requirements, pay for tests and inspections required by Departmental Representative on corrected Work.

1.16 CLEANING

.1 Maintain Site free of accumulated waste and rubbish.

.2 Final cleaning:

.1 Remove temporary protection.

.2 Remove dust, dirt and foreign matter from hard surfaces.

.3 Rake clean other exterior surfaces.

1.17 CONSTRUCTION & DEMOLITION WASTE

.1 Refer to Section 01 74 20 – Construction Waste Management Disposal.

1.18 Not Used

.1 Not Used.

1.19 PROJECT MEETINGS

.1 Administrative:

.1 Schedule and administer project progress meetings throughout the progress of the Work at the call of Departmental Representative.

.2 Prepare agenda for meetings.

.3 Distribute written notice of each meeting five (5) Working Days in advance of meeting date to Departmental Representative.

.4 Provide physical space or suitable conferencing call information and make arrangements for meetings.

.5 Preside at meetings.

.6 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.

.7 Reproduce and distribute copies of minutes within three (3) working days after meetings and transmit to meeting participants and affected parties not in attendance.

.8 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

.2 Preconstruction meeting:

.1 Within five (5) Working Days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.

.3 Establish time and location of meeting and notify parties concerned minimum two (2) Working Days before meeting.

.4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.

.5 Agenda to include:

.1 Appointment of official representative of participants in the Work.

.2 Schedule of Work: in accordance with Section 01 32 16.19 – Construction Progress Schedule – Bar (GANTT) Chart.

.3 Schedule of submission of Shop Drawings and samples.

.4 Requirements for temporary facilities, Site sign, offices, storage sheds, utilities and fences.

.5 Site security.

.6 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.

.7 Owner provided products.

.8 Record Drawings, Specifications and aerial photographs.

.9 Maintenance manuals.

.10 Take-over procedures, acceptance, warranties.

.11 Monthly progress claims, administrative procedures, photographs, hold backs.

.12 Appointment of inspection and testing agencies or firms.

.13 Insurances, transcript of policies.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 GENERAL

1.1 ACCESS AND EGRESS

.1 Design, construct and maintain temporary "access to" and "egress from" Work areas in accordance with relevant municipal, provincial and other regulations, as required.

1.2 USE OF SITE AND FACILITIES

.1 Execute Work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate Work as stated.

.2 Provide for personnel and vehicle access to the Site, as required to complete the Work.

.3 Use of sanitary facilities for use by Contractor's personnel will not be assigned. Contractor to provide temporary facilities in accordance with Section 01 11 06 – General Instructions.

.4 Closures: protect Work temporarily until permanent enclosures are completed.

1.3 EXISTING SERVICES

.1 Notify, Departmental Representative and utility companies of intended interruption of services and obtain required permission.

1.4 SPECIAL REQUIREMENTS

.1 Carry out noise generating Work Monday to Friday from 08:00 to 18:00 hours.

.2 Submit schedule in accordance with Section 01 32 16.19 – Construction Progress Schedule – Bar (GANTT) Chart.

.3 Ensure Contractor's personnel employed on Site become familiar with and obey regulations including safety, fire, traffic and security regulations.

.4 Keep within limits of Work and avenues of ingress and egress, except where indicated otherwise as required to complete Work.

.5 Ingress and egress of Contractor vehicles shall be coordinated with Department Representative at time of contract award.

1.5 SECURITY

.1 The Contractor is responsible for providing security required for the Work of Contract. This includes, at minimum:

.1 Prevent unauthorized people from accessing the Work Site. This includes anyone not involved in the Work of Contract.

.2 Provide security for equipment, resources and material required and/or produced during the Work of Contract.

.3 Provide additional barriers to prevent personnel, equipment, surface run-off and/or animals from falling into open excavations.

1.6 SMOKING ENVIRONMENT

.1 Smoking is not permitted on the Work Site.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 GENERAL

1.1 DEFINITIONS

.1 Activity: element of Work performed during course of Project. Activity normally has expected duration, expected cost and expected resource requirements. Activities can be subdivided into tasks.

.2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.

.3 Baseline: original approved plan (for project, Work package or activity), plus or minus approved scope changes.

.4 Construction Work Week: Monday to Friday, inclusive, will provide five (5) day work week and define schedule calendar Working Days as part of Bar (GANTT) Chart submission. Consideration may be given to working during weekends, if required to meet the project schedule.

.5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as Work Days or Work Weeks.

.6 Master Plan: summary-level schedule that identifies major activities and key milestones.

.7 Milestone: significant event in project, usually completion of major deliverable.

.8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

.9 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project Work in relation to established milestones.

1.2 REQUIREMENTS

.1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.

.2 Plan to complete Work in accordance with prescribed milestones and time frame.

.3 Schedule activity durations to maximum of approximately ten (10) Working Days, to allow for progress reporting.

.4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit to Departmental Representative within five (5) Working Days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

.3 Submit Project Schedule to Departmental Representative within five (5) Working Days of receipt of acceptance of Master Plan.

1.4 PROJECT MILESTONES

.1 Project milestones form interim targets for Project Schedule.

.1 Asbestos abatement, handling, transportation and disposal

.2 Soil excavation, handling, transportation and disposal

.3 Backfill and grading

.4 Site Restoration

.5 Substantial Completion

1.5 MASTER PLAN

.1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).

.2 Departmental Representative will review and return revised schedules within five (5) Working Days.

.3 Revise impractical schedule and resubmit within three (3) Working Days.

.4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.6 PROJECT SCHEDULE

.1 Develop detailed Project Schedule derived from Master Plan.

.2 Ensure detailed Project Schedule for each Site includes as minimum milestone and activity types as follows:

.1 Award;

.2 Permits;

.3 Mobilization;

.4 Asbestos Abatement, handling, transportation and disposal;

.5 Soil Excavation, handling, transportation and disposal;

.6 Backfilling, compacting and grading;

.7 Site Restoration; and

.8 Demobilization.

1.7 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.

.2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.8 PROJECT MEETINGS

.1 Discuss Project Schedule at regular Site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 GENERAL

1.1 ADMINISTRATIVE

.1 Submit to Departmental Representative submittals listed for review. Submittal List (Table 1) is bound into Specification section and is for information only. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with Work affected by submittal until review is complete.

.3 Present Shop Drawings, product data, samples and mock-ups in SI Metric units.

.4 Where items or information is not produced in SI Metric units converted values are acceptable.

.5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.7 Verify field measurements and affected adjacent Work are co-ordinated.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative’s review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.

.10 Keep one (1) reviewed copy of each submission on Site.

.11 Submit electronic format copies specified for each type and format of submittal. Forward unlocked PDF, MS Word, MS Excel, MS Project and AutoCAD Drawing (or GIS) files on disc compatible with Public Services and Procurement Canada (PSPC) encryption requirements or through email or alternate electronic file sharing service such as ftp, as directed by Departmental Representative.

1.2 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "Shop Drawings" means Drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information

necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design Drawings and Specifications.

.3 Allow five (5) Working Days for Departmental Representative's review of each submission.

.4 Adjustments made on Shop Drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.5 Make changes in Shop Drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.

.6 Accompany submissions with transmittal letter, in duplicate, containing:

- .1 Date;
- .2 Project title and number;
- .3 Contractor's name and address;
- .4 Identification and quantity of each Shop Drawing, product data and sample; and
- .5 Other pertinent data.

.7 Submissions include:

- .1 Date and revision dates;
- .2 Project title and number;
- .3 Name and address of:
  - .1 Subcontractor;
  - .2 Supplier; and
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents;
- .5 Details of appropriate portions of Work as applicable:
  - .1 Layout, showing dimensions, including identified field dimensions; and
  - .2 Relationship to adjacent Work.

.8 After Departmental Representative's review, distribute copies.

.9 Submit one (1) electronic copy of product data sheets, Shop Drawings or brochures for requirements requested in Specification Sections and as requested by Departmental Representative where Shop Drawings will not be prepared due to standardized manufacture of product.

.10 Submit one (1) electronic copy of test reports for requirements requested in Specification Sections and as requested by Departmental Representative.

.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.

.2 Testing must have been within one (1) month of date of contract award for project.

.11 Submit one (1) electronic copy of certificates for requirements requested in Specification Sections and as requested by Departmental Representative.

.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets Specification requirements.

.2 Certificates must be dated after award of project contract complete with project name.

.12 Submit one (1) electronic copy of manufacturer’s instructions for requirements requested in Specification Sections and as requested by Departmental Representative.

.1 Pre-printed material describing installation of product, system or material, including special notices and Safety Data Sheets concerning impedances, hazards and safety precautions.

.13 Delete information not applicable to project.

.14 Supplement standard information to provide details applicable to project.

.15 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, transparency copies will be returned and fabrication and installation of Work may proceed. If Shop Drawings are rejected, noted copy will be returned and resubmission of corrected Shop Drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.16 The review of Shop Drawings by the Departmental Representative is for sole purpose of ascertaining conformance with general concept.

.1 This review shall not mean that the Departmental Representative approves detail design inherent in Shop Drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in Shop Drawings or of responsibility for meeting requirements of construction and Contract Documents.

.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job Site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.3 CERTIFICATES

.1 Immediately after award of Contract, submit Workers' Compensation Board status and Insurance Board Experience Report.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 GENERAL

1.1 REFERENCE STANDARDS

.1 Transportation and Dangerous Goods Act (1999).

.2 Canadian Council of Ministers of the Environment (CCME) Documentation.

1.2 MEASUREMENT PROCEDURES

.1 For contaminated soil removal, refer to Section 02 50 00 – Site Remediation.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submittals: in accordance with Section 01 11 06 – General Instructions and 01 33 00 – Submittal Procedures.

.2 Submittals for Progress Meetings: make submittals at least forty-eight (48) hours prior to scheduled progress meetings as follows:

.1 Updated progress schedule detailing activities. Include review of progress with respect to previously established dates for starting and stopping various stages of Work, major problems and action taken, injury reports, equipment breakdown and material removal.

.2 Copies of transport manifests, trip tickets and disposal receipts for waste materials removed from Work areas.

.3 Weekly copies of Site entry and Work area logbooks with information on worker and visitor access.

.4 Copies of the completed underground locates.

.5 Daily logs documenting inspection of erosion and sediment controls.

.6 Information on borrow sources being used to supply backfill material.

.7 Other information required by Departmental Representative or relevant to agenda for upcoming progress meeting.

.3 Complete the Remediation and Risk Management Checklist included in Appendix D and Appendix E and following the completion of the Work, submit a copy of the completed checklist to the Departmental Representative.

.4 Equipment Decontamination Pad: submit equipment decontamination pad design to Departmental Representative for review prior to commencing construction.

.5 Site Layout: within seven (7) days after date of Notice to Proceed and prior to mobilization to Site, submit Site layout Drawings showing existing conditions and facilities, construction facilities and temporary controls provided by Contractor including following:

.1 Truck and vehicle routes, entrances and exits to the Work Sites are to be identified and documented prior to the initiation of construction Work at the respective Work Area.

.2 Equipment and material staging areas.

.3 Equipment and personnel decontamination areas.

.4 Imported clean backfill stockpiling areas.

.6 Before commencing construction activities or delivery of materials to Site, submit Environmental Protection Plan for review and approval by Departmental Representative.

.1 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.

.2 Address topics at level of detail commensurate with environmental issue and required construction tasks.

.3 Include in Environmental Protection Plan:

.1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.

.2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from Site.

.3 Names and qualifications of persons responsible for training Site personnel.

.4 Descriptions of environmental protection personnel training program.

.5 Drawings indicating locations of material storage areas, structures, sanitary facilities and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on Site.

.6 Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plans include measures to minimize amount of mud transported onto public roads by vehicles or runoff.

.7 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas including methods for protection of features to be preserved within authorized Work areas.

.8 A Spills Management and Emergency Response Plan, including procedures, instructions and reports to be used in event of unforeseen spill of regulated substance.

.9 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

.10 Hazardous waste management plan identifying methods and locations for disposal.

.11 Air Pollution Control plan detailing provisions to assure that dust, debris, materials and trash, do not become air borne and travel off project Site.

.12 Contaminant prevention plan that: identifies potentially hazardous substances to be used on job Site; identifies intended actions to prevent introduction of such materials into air, water or ground; and details provisions for compliance with Federal, Provincial and

Municipal laws and regulations for storage and handling of these materials.

.13 Water management plan that identifies methods and procedures for management and/or discharge of waste waters or contaminated groundwater that are directly derived from construction activities, such as clean-up water.

.14 Historical, archaeological, cultural resources, biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, Species at Risk (SAR), biological resources and wetlands.

.7 Submit Erosion and Sediment Control Plan to Departmental Representative prior to mobilization.

1.4 REGULATORY REQUIREMENTS

.1 Develop and implement an Erosion and Sediment Control Plan in accordance with Manitoba Infrastructure “Standard Construction Specifications – Erosion Control”.

.2 Comply with federal, provincial and local anti-pollution laws, ordinances, codes and regulations when disposing of waste materials, debris and rubbish.

.3 Work to meet or exceed minimum requirements established by federal, provincial and local laws and regulations which are applicable including the mitigation measures outlined in Appendix E.

.1 Contractor: responsible for complying with amendments as they become effective.

.4 In event that compliance exceeds scope of Work or conflicts with specific requirements of contract notify Departmental Representative immediately.

1.5 SEQUENCING AND SCHEDULING

.1 The Work is to be completed following the sequencing outlined in the Master Plan as reviewed and approved by the Departmental Representative. The sequencing of the Work cannot be amended without the authorization of the Departmental Representative.

1.6 EQUIPMENT DECONTAMINATION PAD

.1 Prior to commencing Work involving equipment contact with potentially contaminated materials, construct equipment decontamination pad to accommodate largest piece of on-site potentially contaminated equipment.

.2 Provide, operate and maintain necessary equipment, pumps and piping required to collect and contain equipment decontamination wastewater and sediment and transfer materials to approved storage facilities.

1.7 EQUIPMENT DECONTAMINATION

.1 Commence Work involving equipment contact with potentially contaminated material only after the equipment decontamination pad is operational.

.2 Decontaminate equipment after working in potentially contaminated portions of the Work area and prior to subsequent Work or travel on clean areas.

.3 Perform equipment decontamination on Contractor-constructed equipment decontamination pad.

.4 At minimum, perform following steps during equipment decontamination: mechanically remove packed dirt, grit and debris by scraping and brushing without using steam or high-pressure water to reduce amount of water needed and to reduce amount of contaminated rinsate generated. Pay particular attention to tire treads, equipment tracks, springs, joints, sprockets and undercarriages. If required clean water may be used to remove excess packed dirt and debris. Air dry equipment before removing from site or travelling on clean areas. Perform assessment as directed by Departmental Representative determine effectiveness of decontamination.

.5 Each piece of equipment may be inspected by Departmental Representative after decontamination and prior to removal from Site and/or travel on clean areas. Departmental Representative will have right to require additional decontamination to be completed if deemed necessary.

.6 Take appropriate measures necessary to minimize drift of mist and spray during decontamination including provision of wind screens.

.7 Collect decontamination sediments which accumulate on equipment decontamination pad for disposal off-site at a licensed facility. If clean water is required to remove excess packed dirt and debris:

.1 Allow water to percolate into ground surface in a manner that does not mobilize sediment outside of the decontamination pad.

.2 Allow equipment to air dry before removing from Site or travelling on clean areas.

.8 Transfer sediments to disposal transport vehicle.

.9 Dispose of equipment decontamination sediment at an approved and licensed disposal facility.

.10 Furnish and equip personnel engaged in equipment decontamination with protective equipment including suitable disposable clothing, respiratory protection and face shields.

.11 Have on hand sufficient pumping equipment, of adequate pumping capacity and associated machinery and piping in good working condition for ordinary emergencies, including power outage, and competent workers for operation of pumping equipment. Maintain piping and connections in good condition and leak-free.

1.8 SOIL STOCKPILING

.1 Stockpiling of impacted soil is not permitted on Site.

.2 If temporary stockpiling of clean backfill material is required, the Contractor is to ensure that the material is stockpiled on a liner and is covered up with a tarp to prevent contamination, erosion and/or dust.

.1 Liner requirements: light weight geotextile.

.3 Stockpile fill materials in areas designated by Departmental Representative.

1.9 IMPACTED WATER STORAGE

.1 Provide, operate and maintain wastewater storage tanks to store water that may accumulate in excavations should groundwater be encountered or surface run-off.

.2 Discharges: comply with applicable discharge limitations and requirements; do not discharge impacted waters to Site ditches.

.3 Provide pumps and piping to convey collected accumulated waters to designated storage tank; provide a tank with minimum total live capacity of five thousand (5,000) litres at the Work area.

.4 Install impacted water storage tanks in locations presented on Site Layout Plan, approved by Departmental Representative.

.5 Connect pumps, piping, miscellaneous items and necessary utilities as required for operation of facilities; and protect tanks, valves, pumps, piping and miscellaneous items from adverse weather.

.6 Do not operate impacted water storage tanks until inspected and approved by Departmental Representative.

.7 Notify Departmental Representative twenty-four (24) hours minimum in advance of when impacted water storage tank is anticipated to be full.

.8 Transport and dispose of impacted waters at off-site, licensed disposal facility as identified by Contractor and approved by Departmental Representative.

1.10 DEWATERING AND WATER MANAGEMENT

.1 Maintain excavations free of water. Provide, operate and maintain necessary equipment appropriately sized to keep excavations, staging pads and other work areas free from water.

.2 Have on hand sufficient pumping equipment, machinery and tankage in good working condition for ordinary emergencies, including power outage, and competent workers for operation of pumping equipment.

.3 Contain and collect wastewaters and transfer such collected wastewaters to Contractor supplied wastewater storage tanks for disposal.

.4 Dispose of collected wastewaters from excavations off-site at licensed disposal facility, approved by the Departmental Representative.

.5 Dispose of wastewater in manner not injurious to public health or safety, to property, or to any part of Work completed or under construction.

.6 Protect Site from puddling or running water.

.7 Prevent surface water runoff from leaving Work areas.

.8 Do not discharge wastewater, or surface water runoff, which may have come in contact with potentially contaminated material, to the surrounding environment.

.9 Prevent precipitation from infiltrating or from directly running off stockpiled clean backfill materials. Cover stockpiled soil materials with an impermeable liner during periods of Work stoppage including at end of each Working Day and as directed by Departmental Representative.

.10 Direct surface waters that have not contacted potentially contaminated materials to existing surface drainage systems.

1.11 SPILLS MANAGEMENT AND EMERGENCY RESPONSE

.1 A Spills Management and Emergency Response Plan will be developed as part of the EPP and implemented. All workers should be fully aware of the spill prevention and response procedures including notification of the Manitoba Department of Conservation and Climate at 1-855-944-4888.

.2 Spill kits will be kept on-site during all project phases.

1.12 VEHICULAR ACCESS AND PARKING

.1 Maintenance and Use:

.1 Prevent contamination of access roads. Immediately scrape up debris or material on access roads which is suspected to be contaminated as determined by Departmental Representative transport and dispose of in appropriate off-site disposal facility.

.2 Departmental Representative may collect soil samples for chemical analyses from traveling surfaces of constructed and existing access routes prior to, during and upon completion of Work. Excavate and dispose of clean soil contaminated by Contractor's activities at no additional cost to Departmental Representative.

.2 Vehicles/equipment shall be in good working order and not be leaking any fuels or fluids.

.3 Refueling of vehicles and equipment shall not be conducted near watercourses or sewers.

.4 During construction, establish designated fueling area(s), as approved by Departmental Representative.

1.13 DUST AND PARTICULATE CONTROL

.1 Execute Work by methods to minimize raising dust from construction operations.

.2 Implement and maintain dust and particulate control measures as determined necessary by Departmental Representative during construction and in accordance with Province of Manitoba regulations.

.3 Provide positive means to prevent airborne dust from dispersing into atmosphere. Use potable water for dust and particulate control.

.4 Use chemical means for water misting system for dust and particulate control only with Departmental Representative's prior written approval.

.5 As minimum, use appropriate covers on trucks hauling fine or dusty material. Use watertight vehicles to haul wet materials.

.6 Prevent dust from spreading to adjacent property Sites.

.7 Departmental Representative will stop Work at any time when Contractor's control of dusts and particulates is inadequate for wind conditions present at Site, or when air quality monitoring indicates that release of fugitive dusts and particulates into atmosphere equals or exceeds specified levels.

.8 If Contractor's dust and particulate control is not sufficient for controlling dusts and particulates into atmosphere, stop Work. Contractor must discuss procedures that Contractor proposes to resolve problem. Make necessary changes to operations prior to resuming excavation, handling, processing or other Work that may cause release of dusts or particulates.

.9 Stockpiles of imported clean backfill material will be placed on a liner and covered up with a tarp to prevent contamination, erosion and/or dust.

1.14 POLLUTION CONTROL

.1 Reduce or eliminate idling time of equipment and vehicles.

.2 Provide methods, means and facilities to prevent contamination of soil, water and atmosphere from discharge of noxious toxic substances and pollutants produced by construction operations.

.3 Be prepared to intercept, clean up and dispose of spills or releases that may occur whether on land or water. Maintain materials and equipment required for cleanup of spills or releases readily accessible on Site.

.4 Promptly report spills and releases potentially causing damage to environment to:

.1 Authority having jurisdiction or interest in spill or release including conservation authority, water supply authorities, drainage authority, road authority and fire department;

.2 Departmental Representative; and

.3 Spills are to be reported to the Manitoba Department of Conservation and Climate at 1-855-944-4888.

.5 Contact manufacturer of pollutant if known and ascertain hazards involved, precautions required, and measures used in cleanup or mitigating action.

.6 Take immediate action using available resources to contain and mitigate effects on environment and persons from spill or release.

.7 Provide spill response materials including containers, adsorbent, shovels and personal protective equipment. Make spill response materials available at all times in which hazardous materials or wastes are being handled or transported. Spill response materials: compatible with type of material being handled.

.8 Further information on dangerous goods emergency cleanup and precautions including a list of companies performing this Work can be obtained from the Transport Canada twenty-four (24) hour number 613-996-6666 collect.

.9 Spill kits will be kept on-site during all project phases. Any equipment remaining on-site overnight shall have appropriately placed drip pans.

.10 Construction equipment to be operated on land only.

1.15 EROSION AND SEDIMENT CONTROL

.1 Provide erosion and sediment control plan that identifies type and location of sediment controls to be provided. Plan must include monitoring and reporting requirements to assure that control measures are in compliance with Federal, Provincial and Municipal laws and regulations.

.2 Plan and execute construction by methods to control surface drainage from cuts and fills, from stockpiles, staging areas and other Work areas. Prevent sedimentation.

.3 Minimize amount of bare soil exposed at one (1) time. Stabilize disturbed soils as quickly as practical. Remove accumulated sediment resulting from construction activity from adjoining surfaces, drainage systems and water courses, and repair damage caused by sedimentation as directed by Departmental Representative.

.4 Provide and maintain temporary measures which may include, silt fences, hay or straw bales, ditches, geotextiles, berms and other construction required to prevent migration of silt, mud, sediment and other debris off Site or to other areas of Site where damage might result, or that might otherwise be required by Laws and Regulations. Make sediment control measures available during construction.

.5 Hay or Straw Bale: wire bound or string tied; securely anchored by at least two (2) stakes or rebars driven through bale three hundred (300) millimetres to four hundred fifty (450) millimetres into ground; chinked (filled by wedging) with hay or straw to prevent water from escaping between bales; and entrenched minimum of one hundred (100) millimetres into ground.

.6 Silt Fence: assembled, ready to install unit consisting of geotextile attached to driveable posts. Geotextile: uniform in texture and appearance, having no defects, flaws or tears that would affect its physical properties; and contain sufficient ultraviolet ray inhibitor and stabilizers to provide minimum two (2) year service life from outdoor exposure, installed per manufacturer’s recommendations.

.7 Plan construction procedures to avoid damage to Work or equipment encroachment onto drainage ditch banks. In event of damage, promptly take action to mitigate effects. Restore affected bank to existing condition.

.8 Installation:

.1 Check sediment control measures weekly after each rainfall; during prolonged rainfall check daily.

.2 Whenever sedimentation is caused by stripping vegetation, re-grading or other development, remove it from adjoining surfaces, drainage systems and watercourses, and repair damage as quickly as possible.

.3 Prior to or during construction, Departmental Representative may require installation or construction of improvements to prevent or correct temporary conditions on Site. Improvements may include berms, mulching, sediment traps, grading and other measures appropriate to specific condition. Temporary improvements must remain in place and in operation as necessary or until otherwise directed by Departmental Representative.

.4 Only as directed by Departmental Representative, remove temporary sediment control devices upon completion of Work.

.9 If soil and debris from Site accumulate in low areas, roadways, gutters, ditches or other areas where in Departmental Representative's determination it is undesirable, remove accumulation and restore area to original condition.

1.16 FIRES

.1 Fires and burning of debris on Site is not permitted.

1.17 VEGETATION

.1 Protect vegetation that does not have to be removed or disturbed.

.2 Operate construction machinery in a manner that minimizes damage to vegetation by keeping equipment on main roads and pathways.

.3 Stabilize, reseed and/or landscape temporarily disturbed erosion-prone areas as soon as possible following disturbance.

1.18 NOISE CONTROL

.1 All construction equipment shall be operated with exhaust systems in good repair to minimize noise.

.2 Construction activities that could create excessive noise shall be restricted to daylight hours and adhere to municipal noise by-laws.

.3 If Work is to be undertaken outside the specified period in the local noise by-law, approval for an exemption to the by-law shall be obtained by the Contractor from the municipality.

.4 Ensure that noise control devices (e.g., mufflers, silencers) on construction equipment are properly maintained.

.5 Public complaints will be monitored and responded to in a timely manner. All complaints will be recorded and Contractor shall respond to on an individual basis.

1.19 HISTORICAL/ARCHAEOLOGICAL CONTROL

.1 If underground infrastructure or archaeological deposits are discovered during the project, Work shall stop immediately and the Departmental Representative shall immediately be notified.

.2 Archaeologically significant material, if found on the property, remains the property of Sayisi Dene First Nations and shall not be removed from the Site.

.3 Management of the archaeological materials will be coordinated through the Departmental Representative and will be done in consultation with the Sayisi Dene First Nation.

1.20 NOTIFICATION

.1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits and other elements of Contractor's Environmental Protection Plan.

.2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.

.1 Take action only after receipt of written approval by Departmental Representative.

.3 Departmental Representative will issue stop order of Work until satisfactory corrective action has been taken.

.4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

1.21 SPECIES AT RISK

.1 Should a species at risk or its critical habitat be encountered, measures are to be implemented to avoid destruction, injury or interference with the species, its residence and/or its habitat (e.g., through siting, timing or design changes). If the foregoing cannot be avoided Contractor should cease work and contact Departmental Representative for advice regarding mitigation measures.

.2 In the event that it is determined that the project likely may have unexpected adverse effects on species at risk (SAR), the Contractor shall notify the Departmental Representative immediately.

.3 The Manitoba Conservation and Climate and/or Environment and Climate Change Canada should be contacted if a SAR is observed within the Site during Project activities and standard protocol should be performed. Federal designations of SAR are listed under Schedule 1 of SARA.

1.22 MIGRATORY BIRDS/WILDLIFE HABITATS

.1 Disturbance and destruction of habitat should be timed outside of breeding season of early May to mid-August.

.2 Ensure all Works are in compliance with the Migratory Birds Convention Act.

.3 Restrict vehicle movements to construction areas and access roads and avoid harassment of animals.

.4 Conduct Work in such a way as to minimize noise disturbances to birds and wildlife.

.5 If Work is to occur during typical breeding and nesting periods for birds (early May to mid-August), a pre-commencement survey of the Site by a biologist to confirm that no nests are present with the project footprint will be provided by Department Representative.

1.23 FISH/FISH HABITAT

.1 All materials and equipment used will be operated and stored in a manner that prevents any deleterious substance (e.g., chemicals of concern, silt) as defined by the Fisheries Act from entering the surface water.

1.24 PROGRESS CLEANING

.1 Maintain cleanliness of Work and surrounding Site to comply with federal, provincial, and local fire and safety laws, ordinances, codes and regulations.

.2 Co-ordinate cleaning operations with disposal operations to prevent accumulation of dust, dirt, debris, rubbish and waste materials.

.3 Ensure municipal and provincial roadways are kept free of dirt and debris.

1.25 FINAL DECONTAMINATION

.1 Perform final decontamination of construction facilities, equipment and materials which may have come in contact with potentially contaminated materials prior to removal from Site.

.2 Perform decontamination as specified to the satisfaction of the Departmental Representative. The Departmental Representative will direct Contractor to perform additional decontamination if required.

1.26 REMOVAL AND DISPOSAL

.1 Remove surplus materials and temporary facilities from Site.

.2 Dispose of non-contaminated waste materials, litter, debris and rubbish off Site.

.3 Do not burn or bury debris and waste materials on Site.

.4 Do not dispose of volatile or hazardous wastes such as mineral spirits, oil or paint thinner in ditches.

.5 Do not discharge wastes into streams or waterways.

.6 Dispose of following materials at appropriate off-site facility identified by Contractor and approved by Departmental Representative:

.1 Non-contaminated litter and rubbish.

.2 Disposable PPE worn during final cleaning.

.3 Wastewater removed from wastewater storage tank.

.4 Wastewater and sediment generated from final decontamination operations including wastewater storage tank cleaning.

.5 Lumber from decontamination pads.

.7 Dispose of materials in accordance with Section 01 74 20 – Construction Waste Management Disposal or as directed by Departmental Representative.

.8 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.

1.27 RECORD KEEPING

.1 Maintain adequate records to support information provided to Departmental Representative regarding exception reports, annual reports and biennial reports.

.2 Maintain waste shipment records for minimum of three (3) years from date of shipment or longer period required by applicable law or regulation.

.3 Maintain bills of ladings for minimum of three hundred seventy-five (375) days from date of shipment or longer period required by applicable law or regulation.

.4 Records to be provided to the Departmental Representative upon request.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 GENERAL

1.1 REFERENCE STANDARDS

.1 Canada Labour Code Part II-Occupational Health and Safety (R.S.1985,c.L-2);

.2 Canada Occupational Health and Safety Regulations (SOR/86-304);

.3 Health Canada/Workplace Hazardous Materials Information System (WHMIS):

.1 WHMIS Safety Data Sheets (SDS).

.4 Province of Manitoba:

.1 Manitoba Workplace Safety and Health Act, C.C.S.M c. W210 (amended October 17, 2018);

.2 Manitoba Workplace Safety and Health Regulation, M.R. 217/2006;

.3 The Workers Compensation Act (amended November 2, 2020); and

.4 Municipal statutes and authorities.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit Site specific Health and Safety Plan: Within seven (7) days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:

.1 Results of Site specific safety hazard assessment;

.2 Results of safety and health risk or hazard analysis for Site tasks and operation found in Work plan; and

.3 Measures and controls to be implemented to address identified safety hazards and risks.

.3 Departmental Representative will review Contractor's Site specific Health and Safety Plan and provide comments to Contractor within three (3) Working Days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within three (3) Working Days after receipt of comments from Departmental Representative.

.4 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.5 Submit names of personnel and alternates responsible for Site safety and health.

.6 Contractor's and Sub-contractors' Safety Communication Plan.

.7 Submit records of Contractor's Health and Safety meetings when requested.

.8 Contingency and Emergency Response Plan addressing standard operating procedures specific to the project site to be implemented during emergency situations.

.9 Submit two (2) copies of Contractor's authorized representative's Work Site health and safety inspection reports to Departmental Representative.

.10 Submit copies of orders, directions or reports issued by health and safety inspectors of the authorities having jurisdiction.

.11 Submit copies of incident and accident reports.

.12 Submit Safety Data Sheets (SDS).

.13 Submit Workplace Safety and Insurance Board (WSIB) – Experience Rating Report.

1.3 FILING OF NOTICE

.1 File Notice of Project with Provincial authorities prior to beginning of Work.

1.4 WORK PERMIT

.1 Obtain permits related to project prior to commencement of Work.

1.5 SAFETY ASSESSMENT

.1 Perform Site specific safety hazard assessment related to project.

1.6 MEETINGS

.1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

1.7 REGULATORY REQUIREMENTS

.1 Comply with the Acts and regulations of the Province of Manitoba.

.2 Comply with specified standards and regulations to ensure safe operations at Site.

1.8 PROJECT/SITE CONDITIONS

.1 Work at Site will involve contact with:

.1 Petroleum Hydrocarbons (PHC), Polycyclic Aromatic Hydrocarbons (PAH), Volatile Organic Compounds (VOC) and metals associated with impacted soil and/or groundwater at the Work areas.

.2 Asbestos associated with building materials.

1.9 GENERAL REQUIREMENTS

.1 Develop written Site specific Health and Safety Plan based on hazard assessment prior to beginning Site Work and continue to implement, maintain and enforce plan until final demobilization from Site. Health and Safety Plan must address project specifications.

.2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns either accepting or requesting improvements.

.3 Relief from or substitution for any portion or provision of minimum Health and Safety standards specified herein or reviewed site-specific Health and Safety Plan shall be submitted to Departmental Representative in writing.

1.10 RESPONSIBILITY

.1 Be responsible for health and safety of persons on Site, safety of property on Site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations and ordinances and with Site specific Health and Safety Plan.

1.11 COMPLIANCE REQUIREMENTS

.1 Comply with Manitoba Workplace Safety and Health Act, C.C.S.M c. W210 (amended October 17, 2018) and Manitoba Regulations for Construction Projects – Standard Construction Specifications.

1.12 UNFORSEEN HAZARDS

.1 Should any unforeseen or peculiar safety-related factor, hazard or condition become evident during performance of Work, immediately stop Work and advise Departmental Representative verbally and in writing.

.2 Follow procedures in place for Employees Right to Refuse Work as specified in the Workplace Safety and Health Act for the Province of Manitoba.

1.13 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on Site in accordance with Acts and Regulations of Province of Manitoba, and in consultation with Departmental Representative.

.1 Contractor's Safety Policy.
.2 Constructor's Name.
.3 Notice of Project.
.4 Name, trade and employer of Health and Safety Representative or Joint Health and Safety Committee members (if applicable).
.5 Ministry of Labour Orders and reports.
.6 Manitoba Workplace Safety and Health Act.
.7 Address and phone number of nearest Ministry of Labour office.
.8 Material Safety Data Sheets.
.9 Written Emergency Response Plan.
.10 Site Specific Safety Plan.
.11 Valid certificate of first aider on duty.

.12 WSIB "In Case of Injury at Work" poster.

.13 Location of toilet and cleanup facilities.

1.14 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.

.2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.15 BLASTING

.1 Blasting or other use of explosives is not permitted.

1.16 WORK STOPPAGE

.1 Give precedence to safety and health of public and Site personnel and protection of environment over cost and schedule considerations for Work.

.2 Assign responsibility and obligation to Competent Supervisor to stop or start Work when, at Competent Supervisor's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 GENERAL

1.1 INSPECTION

.1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.

.3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.4 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such Work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

1.2 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.

.2 Employment of inspection/testing agencies does not relax the responsibility to perform Work in accordance with Contract Documents.

1.3 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work.

.2 Co-operate to provide reasonable facilities for such access.

1.4 PROCEDURES

.1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order for attendance arrangements to be made.

.2 Submit samples and/or materials required for testing, as specifically requested in Specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on Site.

1.5 REJECTED WORK

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been

rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 GENERAL

1.1 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris.

.2 Remove waste materials from Site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on Site.

.3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.4 Provide on-site containers for collection of waste materials and debris.

.5 Provide and use marked separate bins for recycling. Refer to Section 01 74 20 – Construction Waste Management Disposal.

.6 Dispose of waste materials and debris off Site.

.7 Store volatile waste in covered metal containers and remove from premises at end of each Working Day.

.8 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

1.2 FINAL CLEANING

.1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.3 Prior to final review remove surplus products, tools, construction machinery and equipment.

.4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.5 Remove dirt and other disfiguration from exterior surfaces.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials in accordance with Section 01 74 20 – Construction Waste Management Disposal.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 GENERAL

1.1 SUMMARY

.1 Work includes waste management and disposal of miscellaneous debris encountered throughout the Site, including but not limited to, broken glass, cans, scrap metal, miscellaneous construction debris and household items as well as waste generated during Work activities. It is estimated that there is approximately fifteen (15) tonnes of miscellaneous debris scattered throughout the project Site primarily surrounding the building foundations. Further description of the miscellaneous debris encountered throughout the site and approximate GPS points is included in Appendix A (Phase I/II Environmental Site Assessment – Table 1).

1.2 RELATED REQUIRMENTS

.1 Section 02 82 00.01 – Asbestos Abatement Minimum Precautions.

1.3 PRICE AND PAYMENT PROCEDURES

.1 Unit Prices:

.1 Provide unit price per metric tonne to load, transport and dispose of miscellaneous debris from the Work area.

.2 Measurement of miscellaneous debris shall be based on the net weight of material delivered at the disposal facility, as measured by the facility's scale and substantiated by certified weigh bills.

1.4 SUBMITTALS

.1 Submit in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit a Waste Management Plan five (5) days prior to the commencement of Work activities, including complete list of wastes, including waste registration numbers as required by provincial regulations, for materials that will be generated by Work activities.

.1 Indicate materials and quantities of material that will be recycled and diverted from landfill.

.2 Indicate how material being removed from the Site will be reused and recycled.

.3 Submit proof that all waste is being disposed of at a licensed landfill site or waste transfer site. A copy of the disposal/waste transfer site's license and a letter verifying that said landfill site will accept the waste must be supplied to Departmental Representative prior to removal of waste from the Sites.

1.5 STORAGE, HANDLING AND PROTECTION

.1 Unless specified otherwise, materials for removal become Contractor's property.

.2 Protect, stockpile, store and catalogue salvaged items.

.3 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.

.4 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.

.1 On-site source separation is recommended.
.2 Remove co-mingled materials to off-site processing facility for separation.
.3 Provide waybills for separated materials.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Do not bury rubbish and waste materials on Site.

.2 All waste materials shall be disposed of in a legal manner at a site approved by Local Authorities and the Departmental Representative.

.3 Provide acceptable containers for collection and disposal of waste materials, debris and rubbish.

.4 Do not allow deleterious substances to enter the waterway.

.5 Keep records of construction waste including:

.1 Number and size of bins.
.2 Waste type of each bin.
.3 Total tonnage generated.
.4 Tonnage reused or recycled.
.5 Reused or recycled waste destination.

.6 Remove from Site and dispose of all packaging materials at appropriate recycling facilities.

.7 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.8 All waste materials including containers and waste fluids associated with vehicle maintenance shall be disposed of in a legal manner at a site approved by Local Authorities.

.9 Divert unused metal materials from landfill to metal recycling facility as approved by Departmental Representative.

.10 Fold up metal banding, flatten and place in designated area for recycling.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

Part 3 EXECUTION

3.1 APPLICATION

.1 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.2 CLEANING

.1 Remove tools and waste materials on completion of Work, and leave Work area in clean and orderly condition.

.2 Clean-up Work area as Work progresses.

.3 Source separate materials to be reused/recycled into specified sort areas.

3.3 DIVERSION OF MATERIALS

.1 From following list, separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by Departmental Representative, and consistent with applicable fire regulations.

.1 Mark containers or stockpile areas.

.2 Provide instruction on disposal practices.

.2 Divert unused metal and wiring materials from landfill to metal recycling facility approved by Departmental Representative.

END OF SECTION

Part 1 GENERAL

1.1 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures:

.1 Contractor's Inspection: Contractor – conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify Departmental Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.

.2 Request Departmental Representative's inspection.

.2 Departmental Representative Inspection:

.1 Departmental Representative and Contractor to inspect Work and identify defects and deficiencies.

.2 Contractor to correct Work as directed.

.3 Completion Tasks – Submit written certificates that tasks have been performed as follows:

.1 Work – completed and inspected for compliance with Contract Documents;

.2 Defects – corrected and deficiencies completed; and

.3 Work – complete and ready for final inspection.

.4 Final Inspection:

.1 When completion tasks are done, request final inspection of Work by Departmental Representative and Contractor.

.2 When Work incomplete according to Departmental Representative, complete outstanding items and request re-inspection.

.5 Declaration of Substantial Performance: when Departmental Representative considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.

.6 Commencement of Warranty Period: date of Departmental Representative's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period.

.7 Final Payment:

.1 When Departmental Representative considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.

1.2 CLEANING

.1 In accordance with Section 01 74 11 – Cleaning.

.2 Remove waste and surplus materials, rubbish and construction facilities from the Site in accordance with Section 01 74 20 – Construction Waste Management Disposal.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

DIVISION 02 – EXISTING CONDITIONS

Part 1 GENERAL

1.1 SUMMARY

.1 Work Includes, non-hazardous contaminated soil removal and off-site disposal, and placement of imported clean backfill within the excavation. Soil remediation work includes:

.1 Remedial soil excavation, on-site management of soil and off-site disposal of non-hazardous contaminated soil from within the two (2) APECs (Numbered: APEC 1 and APEC 2). The areas to be excavated are indicated on Drawing C-02.

.2 Provide equipment and labour required for soil remediation.

.3 Transportation of all equipment, staff, clean backfill, contaminated materials, to and from Site as required.

.4 Co-ordination, supervision and preparation for remediation of contaminated soil. Departmental Representative requires one (1) week notice previous to the commencement of Site Work for provision of Site supervision.

.5 Provision and installation of materials and equipment necessary to remediate Site.

.6 Implementation of safety work zones, temporary barriers, Site Health and Safety Plans and Emergency Response Plans and other plans as required.

.7 Backfilling of the excavation with imported clean backfill, compaction, grading and Site restoration in accordance with the relevant Sections.

.8 If groundwater is encountered, dewatering of excavations and management of groundwater during excavations as detailed in Section 01 35 13.43 – Special Project Procedures for Contaminated Sites.

.9 Survey Work area, as required, to confirm Site conditions and quantities of material managed which are not measured by tonnage and provide the survey information to the Departmental Representative.

1.2 MEASUREMENT PROCEDURES

.1 Unit Prices:

.1 Provide unit price per metric tonne to excavate, load, transport and dispose of non-hazardous contaminated soil from the Work area at a licensed soil disposal facility or waste disposal grounds as per Manitoba Conservation and Climates Criteria for Acceptance of Contaminated Soil at Waste Disposal Grounds (Guideline June 2016).

.2 Measurement of contaminated soil shall be based on the net weight of contaminated soil delivered at the disposal facility, as measured by the facility's scale and substantiated by certified weigh bills.

.1 All contaminated soil shall be disposed of at a licensed facility or waste disposal grounds as per Manitoba Conservation and Climates Criteria for Acceptance of Contaminated Soil at Waste Disposal Grounds (Guideline June 2016).

.2 Price to include equipment and labour and any other requirements to complete the Work.

.2 Materials removed from beyond tonnage specified on Drawing C-02 will be measured only when Departmental Representative authorizes additional excavation.

.3 Material managed beyond the estimated limits indicated above and/or on the Drawings will not be measured for payment.

.4 Confirmatory soil sampling completed by the Departmental Representative must indicate that soil concentrations in the base and sidewalls of the excavations meet the CCME Soil Quality Guidelines for a residential/parkland Site, prior to being backfilled. Material requiring removal beyond the limits indicated on the Drawings, based on the results of confirmatory soil sampling and as directed by the Departmental Representative, will be measured and paid for by the unit rate provided in the combined price form.

1.3 REFERENCE STANDARDS

.1 Applicable environmental and health and safety laws and regulations for Province of Manitoba, Municipal by-laws.

.2 Manitoba Water Quality Standards, Objectives and Guidelines.

.3 CEPA (Canadian Environmental Protection Act).

.4 CCME (Canadian Council of Ministers of the Environment) Contaminated Sites, Contaminated Soil and Groundwater, and Remediation of Contaminated Sites most current publications.

.5 CCME Canada-Wide Standards for Petroleum Hydrocarbons in Soil.

.6 Manitoba Environmental Act, C.C.S.M. c. (amended June 3, 2019).

.7 Manitoba Provincial Standard Construction Specifications:

.1 Number 1001(I) June 2011 – Supplying and Placing Backfill.
.2 Number 1002 M February 1982 – Supplying and Placing Granular Backfill.
.3 Number 1003 M February 1982 – Supplying Coarse Granular Backfill.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit to Departmental Representative prior to commencement of Work on-site:

.1 Proof that a licensed disposal facility or waste disposal ground will accept excavated contaminated soil.

.3 Closeout Submittals:

.1 Provide Closeout Submittals in accordance with Section 01 33 00 – Submittal Procedures as follows:

.1 Provide written proof (weigh scale tickets) that contaminated soil has been disposed at licensed disposal facility by for Province of Manitoba or waste disposal grounds.

1.5 QUALITY CONTROL

.1 Regulatory Requirements:

.1 Perform Work in accordance with:

.1 Acts, Regulations, Laws, guidelines codes of practice, directives and policies of government authorities pertaining to: environment, noise, water supply, waste water; air quality, health and safety, transportation, waste management.

.2 CCME (Canadian Council of Ministers of the Environment) Contaminated Sites, Contaminated Soil and Groundwater, and Remediation of Contaminated Sites most current publications.

.3 Canadian Environmental Protection Act (New Substance Notification Regulations).

.4 Transportation of Dangerous Goods Act.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Non-Hazardous Contaminated Soil:

.1 Load the excavated non-hazardous contaminated soil into dump trucks and/or sealed metal roll-off bins for off-site disposal.

.2 Stockpiling of contaminated soil is not permitted on Site.

.2 New Materials and Equipment:

.1 If temporary stockpiling of clean backfill is required, the Contractor is to ensure that the material is stockpiled on a geotextile and is covered up nightly with a tarp to prevent contamination.

1.7 SITE CONDITIONS

.1 Existing Conditions:

.1 Review the attached appendices and Drawings, including the Remedial Action Plan – Former Sayisi Dene Village, Churchill, Manitoba dated March 2021.

1.8 MAINTENANCE OF ACCESS ROADS

.1 Maintain access roads in accordance with Section 01 11 06 – General Instructions and as follows:

.1 Maintain and clean access roads for duration of Work.

.2 Repair damage incurred from use of roads.

.3 Provide photographic documentation of roads used by construction vehicles before, during and after Work.

1.9 UTILITY LINES

.1 Before commencing Work, establish location and extent of utility lines in the Work Area. Notify Departmental Representative of findings.

.2 Make good damage to existing utility lines resulting from Work.

1.10 WASTE MANAGEMENT AND DISPOSAL

.1 Waste management in accordance with Section 01 74 20 – Construction Waste Management Disposal.

Part 2 PRODUCTS

2.1 MATERIALS

.1 Imported Clean Backfill: as per Section 31 23 10 – Excavating, Trenching and Backfilling.

.2 Contaminated Soil: excavate and remove daily.

2.2 EQUIPMENT

.1 Leave equipment and machinery running only while in use, except where extreme temperatures prohibit shutting down.

.2 Trucks and Roll-off Bins:

.1 Clean meticulously between loads of contaminated soil and clean backfill.

.2 Clean meticulously at end of Work Day.

.3 Cover truck bodies with tarpaulins during transportation.

.4 Use watertight truck bodies or roll-off bins for transporting contaminated soil.

Part 3 EXECUTION

3.1 PREPARATION

.1 Protection:

.1 Keep excavation Sites water free throughout Work and manage recovered water according to Section 01 35 13.43 – Special Project Procedures for Contaminated Sites.

.2 Protect excavations from rainwater.

.3 Provide temporary structures to divert flow of surface waters from excavation.

.4 Provide safety measures to ensure worker and public safety.

.5 Consult Departmental Representative regarding potential Site specific geotechnical considerations.

.6 Protect buried services that are required to remain undisturbed.

.7 Protect existing structures, foundations and outfalls from damage during Work. Make good of all damages at no additional costs to the Contract.

.8 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

3.2 APPLICATION

.1 Soil Management:

.1 Excavate, load, transport and dispose of off-site contaminated soil in accordance with applicable provincial standards, requirements and regulations.

.2 Do not dilute contaminated soil with less contaminated soil.

.2 Groundwater Management:

.1 In accordance with section 01 35 13.43 – Special Project Procedures for Contaminated Sites.

3.3 METHOD OF REMEDIATION

.1 The remediation of the contaminated soil within the APECs will be completed by soil excavation to a depth of approximately 0.5 to one (1) meters below grade (refer to Remedial Action Plans and Drawings) and off-site disposal at a licensed landfill facility or approved waste disposal ground. The inferred extent of the remediation Work area is based on total mass as indicated in the Drawings. The Departmental Representative will direct the depth and the lateral extent of the excavation. Soil confirmation samples will be collected from the excavation by the Department Representative. During the remediation confirmation process (i.e., sampling, analysis and subsequent analytical result review), excavated areas shall be barricaded to mitigate hazards associated with health and safety and wildlife from entering the excavations as indicated in Section 01 14 00 – Work Restrictions. Upon confirmation by the Departmental Representative, backfilling shall be completed using clean imported backfill material to re-instate grades to match the surrounding areas. Remedial soil excavation shall be completed by Contractor and supervised by Departmental Representative.

.2 Off-site disposal of contaminated soil.

.1 Soil removal and off-site disposal shall be completed by the Contractor. Be responsible for schedule of contaminated soil removal.

.2 Copies of the disposal weight tickets shall be provided to the Departmental Representative.

.3 Removal and off-site disposal of contaminated soils in accordance with applicable federal and provincial regulations.

3.4 EXCAVATING

.1 Excavate to elevations and dimensions indicated or required for construction of work.

.2 Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with provincial legislation.

.3 Make excavation to clean lines to minimize quantity of fill material required.

.4 Earth bottoms of excavations to be reasonably level, free from loose or organic matter.

.5 When completed, the Departmental Representative shall inspect excavation to verify depth and dimension.

.6 Excavation exceeding that shown on the Drawings if authorized in writing by Departmental Representative, will be paid as extra to Contract price in accordance with General Conditions. Quantities will be calculated by unit rates (tonnage for disposal). Truck load measurements will not be accepted.

.7 Correct unauthorized excavation at no extra cost to Contract as directed by Departmental Representative.

3.5 SEQUENCING

.1 Protect infrastructure to remain, as indicated in accordance with the appropriate Sections and on the Drawings.

.2 Excavation to be completed in up to five hundred (500) millimetres lifts and as directed by Departmental Representative. Contaminated soil shall be removed and disposed. Stockpiling of contaminated soil is not permitted on Site.

.1 Departmental Representative to sample clean backfill at source location at a rate of one (1) sample per one hundred (100) cubic meter for verification prior to being imported to Site to be used to backfill the excavation as part of Site restoration. Contractor is to allow up to ten (10) business days for the receipt of analytical results, from time of sample collection.

.2 If groundwater is encountered in excavations, it will be managed according to Section 01 35 13.43 – Special Project Procedures for Contaminated Sites.

.3 Departmental Representative shall collect confirmatory sidewall and base samples from the excavation and shall submit for laboratory analysis. If results indicate contaminated soil remains greater than the generic CCME Canadian Soil Quality guidelines (CEQG) and/or Canada-wide Standards (CWS), Departmental Representative shall direct the Contractor for additional excavation. Departmental Representative shall take additional confirmatory wall samples for laboratory analysis. Backfilling of the excavated area shall commence when excavation completed to floor and wall soil samples satisfy CCME CEQG. Contractor is to allow up to ten (10) business days for the receipt of analytical results, from time of sample collection.

.3 Remove, transport and dispose of contaminated soil in accordance with this Section.

.4 Backfill with clean imported backfill after receiving approval of backfill source. Complete backfilling in accordance with Section 31 23 10 – Excavating, Trenching and Backfilling.

.5 Complete Site restoration in accordance with Section 31 23 10 – Excavating, Trenching and Backfilling.

3.6 RESTORATION

.1 Backfill excavation in accordance with Section 31 23 10 – Excavating, Trenching and Backfilling. Ensure confirmatory sampling results indicate that contaminant concentrations are in compliance with applicable CCME guidelines prior to backfilling.

.2 Re-instate surface grading to give Site same appearance as before remediation Work.

.3 Clean permanent access roads of contamination resulting from project activity at request of Departmental Representative.

3.7 EQUIPMENT DECONTAMINATION

.1 Decontaminate equipment used in Work in the designated area approved by the Departmental Representative and remove from Site at end of Work in accordance with Section 01 35 13.43 – Special Project Procedures for Contaminated Sites.

END OF SECTION

Part 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 02 82 00.01 – Asbestos Abatement Minimum Precautions.

1.2 REFERENCE STANDARDS

.1 Canadian Environmental Protection Act, 1999 (CEPA 1999).

.1 Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149).

.2 Department of Justice Canada (Jus).

.1 Transportation of Dangerous Goods Act, 1992 (TDG Act) (1992), (c. 34).

.2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).

.3 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.1 WHMIS Safety Data Sheets (SDS).

.4 Manitoba Workplace Safety and Health Regulation, Reg 217/2006.

.5 National Research Council Canada (NRC).

.1 National Fire Code of Canada (2015) (NFC).

.6 Public Services and Procurement Canada Asbestos Management Standard, June 2017 (updated June 2019).

.7 SAFE Work Manitoba, Guide for Asbestos Management, November 2020.

.8 The Workplace Safety & Health Act, Manitoba, Chapter W210 C.C.S.M.

1.3 DEFINITIONS

.1 Dangerous Goods: product, substance or organism specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.

.2 Hazardous Material: product, substance or organism used for its original purpose; and is either dangerous goods or material that will cause adverse impact to environment or adversely affect health of persons, animals or plant life when released into environment.

.3 Hazardous Waste: hazardous material no longer used for its original purpose and that is intended for recycling, treatment or disposal.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for hazardous materials and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit two (2) copies of WHMIS Safety Data Sheets (SDS) in accordance with Section 01 35 29.06 – Health and Safety Requirements to Departmental Representative for each hazardous material required prior to bringing hazardous material on Site.

.3 Submit hazardous materials management plan to Departmental Representative that identifies hazardous materials, usage, location, personal protective equipment requirements and disposal arrangements.

.4 Hazardous waste classification: identify waste codes applicable to each hazardous waste material based on applicable federal and provincial acts, regulations and guidelines. Waste profiles, analyses and classification submitted to Contract offices for review and approval.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Transport hazardous materials and wastes in accordance with Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.

.3 Storage and Handling Requirements:

.1 Co-ordinate storage of hazardous materials with Departmental Representative and abide by internal requirements for labelling and storage of materials and wastes.

.2 Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes and guidelines.

.3 Store and handle flammable and combustible materials in accordance with National Fire Code of Canada (NFC) requirements.

.4 Keep no more than forty-five (45) litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.

.1 Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.

.2 Storage of quantities of flammable and combustible liquids exceeding forty-five (45) litres for work purposes requires the written approval of the Departmental Representative.

.5 Transfer flammable and combustible liquids away from open flames or heat-producing devices.

.6 Solvents or cleaning agents: non-flammable or have flash point above thirty-eight (38) degrees Celsius.

.7 Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum.

.8 Smoking is prohibited on Site.

.9 Storage requirements for quantities of hazardous materials and wastes in excess of five (5) kilograms for solids and five (5) litres for liquids:

.1 Store hazardous materials and wastes in closed and sealed containers.

.2 Label containers of hazardous materials and wastes in accordance with WHMIS.

.3 Store hazardous materials and wastes in containers compatible with that material or waste.

.4 Segregate incompatible materials and wastes.

.5 Ensure that different hazardous materials or hazardous wastes are stored in separate containers.

.6 Store hazardous materials and wastes in secure storage area with controlled access.

.7 Maintain clear egress from storage area.

.8 Store hazardous materials and wastes in location that will prevent them from spilling into environment.

.9 Have appropriate emergency spill response equipment available near storage area, including personal protective equipment.

.10 Maintain inventory of hazardous materials and wastes, including product name, quantity and date when storage began.

.11 When hazardous waste is generated on Site:

.1 Co-ordinate transportation and disposal with Departmental Representative.

.2 Comply with applicable federal, provincial and municipal laws and regulations for generators of hazardous waste.

.3 Use licensed carrier authorized by provincial authorities to accept subject material.

.4 Before shipping material obtain written notice from intended hazardous waste treatment or disposal facility it will accept material and it is licensed to accept this material.

.5 Label containers with legible, visible safety marks as prescribed by federal and provincial regulations.

.6 Only trained personnel handle, offer for transport or transport dangerous goods.

.7 Provide photocopy of shipping documents and waste manifests to Departmental Representative.

.8 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide photocopy of completed manifest to Departmental Representative.

.9 Report discharge, emission or escape of hazardous materials immediately to Departmental Representative and appropriate provincial authority. Take reasonable measures to control release.

.12 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.

.13 Report spills or accidents immediately to Departmental Representative. Submit a written spill report to Departmental Representative within twenty-four (24) hours of incident.

Part 2 PRODUCTS

2.1 MATERIALS

.1 Description:

.1 Bring on Site only quantities hazardous material required to perform Work.

.2 Maintain WHMIS Safety Data Sheets (SDS) in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

.3 Spill Response Materials: provide spill response materials which can be used for absorbing/shoveling and containing hazardous materials.

.4 Provide personal protective equipment.

Part 3 EXECUTION

3.1 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 – Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 – Cleaning.

.3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 20 – Construction Waste Management and Disposal.

.1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations and guidelines.

.2 Recycle hazardous wastes for which there is approved, cost effective recycling process available.

.3 Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.

.4 Burning, diluting or mixing hazardous wastes for purpose of disposal is prohibited.

.5 Disposal of hazardous materials in waterways, storm or sanitary sewers or in municipal solid waste landfills is prohibited.

.6 Dispose of hazardous wastes in timely fashion in accordance with applicable provincial regulations.

.7 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.

.8 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:

.1 Hazardous wastes recycled in manner constituting disposal.

.2 Hazardous waste burned for energy recovery.

.3 Lead-acid battery recycling.

.4 Hazardous wastes with economically recoverable precious metals.

END OF SECTION

Part 1 GENERAL

1.1 SUMMARY

.1 Comply with requirements of this Section when performing following Work following Minimum Risk Work (Type 1) operations as defined by the SAFE Work Manitoba *Guide for Asbestos Management* (November 2020):

.1 Removing non-friable asbestos-containing materials, “Transite” cement board and vinyl floor tile debris, if the material is removed without being broken, cut, drilled, abraded, ground, sanded or vibrated at locations provided in the Dillon Consulting Limited and Outcome Consultants report Phase I/II Environmental Site Assessment Former Sayisi Dene Village Site Part Parcel A Plan #39799 PLTO Churchill, Manitoba, dated December 2019.

.2 Break, cut, grind, sand, drill, scrape, vibrate or abrade non-friable asbestos containing materials using non-powered hand-held tools, and the material is wetted to control the spread of dust or fibres.

1.2 RELATED REQUIREMENTS

.1 Section 02 81 00 – Hazardous Materials.

1.3 REFERENCE STANDARDS

.1 Department of Justice Canada (Jus).

.1 Canadian Environmental Protection Act, 1999 (CEPA).

.2 SOR/2018-196 Prohibition of Asbestos and Products Containing Asbestos Regulations.

.2 Manitoba Workplace Safety and Health Regulation, Reg 217/2006.

.3 Public Services and Procurement Canada Asbestos Management Standard, June 2017 (updated June 2019).

.4 SAFE Work Manitoba.

.1 Guide For Asbestos Management, November 2020.

.5 The Workplace Safety & Health Act, Manitoba, Chapter W210 C.C.S.M.

.6 Transport Canada (TC).

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

1.4 DEFINITIONS

.1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97 percent efficiency.

.2 Amended Water: water with non-ionic surfactant wetting agent added to reduce water tension to allow thorough wetting of fibres.

.3 Asbestos-Containing Materials (ACMs): a friable material containing 0.1 percent or greater asbestos; a non-friable material containing one (1.0) percent or greater asbestos and are identified under Existing Conditions including fallen materials and settled dust.

.4 Asbestos Work Area: area where Work takes place which will, or may, disturb ACMs.

.5 Authorized Visitors: Consultants or designated representative, and representatives of regulatory agencies.

.6 Competent worker: in relation to specific Work, means a worker who:

.1 Is qualified because of knowledge, training and experience to perform the Work.

.2 Is familiar with the provincial and federal laws and with the provisions of the regulations that apply to the Work.

.3 Has knowledge of all potential or actual danger to health or safety in the Work.

.7 Friable material: means material that:

.1 When dry, can be crumbled, pulverized or powdered by hand pressure; or

.2 Is crumbled, pulverized or powdered.

.8 Non-Friable Material: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.

.9 Occupied Area: any area of the Work Site that is outside Asbestos Work Area.

.10 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears and elsewhere as required to provide protection and isolation.

.11 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for Work.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of asbestos-containing waste in accordance with requirements of authority having jurisdiction.

.3 Submit Provincial and/or local requirements for Notice of Project Form.

.4 Submit proof of Contractor's Asbestos Liability Insurance.

.5 Submit to Departmental Representative necessary permits for transportation and disposal of asbestos-containing waste and proof that asbestos-containing waste has been received and properly disposed.

.6 Submit proof that all asbestos workers and/or supervisor have received appropriate training and education by a competent person in the hazards of asbestos exposure, good personal hygiene and work practices while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing.

.7 Submit proof satisfactory to Departmental Representative that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test) with respirator that is personally issued.

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements: comply with Federal, Provincial and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications, more stringent requirement applies. Comply with regulations in effect at time Work is performed.

.2 Health and Safety:

.1 Perform construction occupational health and safety in accordance with Section 01 35 29.06 – Health and Safety Requirements.

.2 Safety Requirements: worker protection.

.1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:

.1 Air purifying half-mask respirator with N-100, R-100 or P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction. The respirator to be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet. The respirator to be cleaned, disinfected and inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one (1) worker, or after each use when used by more than one (1) worker. The respirator to have damaged or deteriorated parts replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator.

.2 Disposable-type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective

clothing to be provided by the employer and worn by every worker who enters the Work area, and the protective clothing shall consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing to include suitable footwear, and to be repaired or replaced if torn.

.2 Eating, drinking, chewing and smoking are not permitted in Asbestos Work Area.

.3 Before leaving Asbestos Work Area, the worker can decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, or, if the protective clothing will not be reused, place it in a container for dust and waste. The container to be dust tight, suitable for asbestos waste, impervious to asbestos, identified as asbestos waste, cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before removal from the Work area, and removed from the Work area frequently and at regular intervals.

.4 Facilities for washing hands and face shall be provided within or close to the Asbestos Work Area.

.5 Ensure workers wash hands and face when leaving Asbestos Work Area. Facilities for washing are to be erected and designated by the contractor.

.6 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 20 – Construction Waste Management and Disposal.

.2 Remove from Site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal plastic, paper, or corrugated cardboard packaging material for recycling in accordance with Waste Management Plan.

.4 Separate for recycling and place in designated containers metal and or steel waste in accordance with Waste Management Plan.

.5 Place materials defined as hazardous or toxic in designated containers.

.6 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

.7 Fold up metal banding, flatten and place in designated area for recycling.

.8 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial and Municipal regulations. Dispose of asbestos waste in

sealed double thickness six (6) mils bags or leak proof drums. Label containers with appropriate warning labels.

.9 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

1.8 EXISTING CONDITIONS

.1 Reports and information pertaining to ACMs to be handled, removed or otherwise disturbed and disposed of during this project are bound into this specification.

.2 Building material debris was observed to be loose on the ground within the vicinity of the former buildings at the Site. Debris determined to contain asbestos included “Transite” cement board and vinyl floor tiles with associated mastic. These materials, where present, are to be removed and disposed as asbestos waste. It is estimated that approximately two (2) tonnes of asbestos waste is located on the ground surface throughout the Site based on the Dillon Consulting Limited and Outcome Consultants report Phase I/II Environmental Site Assessment Former Sayisi Dene Village Site Part Parcel A Plan #39799 PLTO Churchill, Manitoba, dated December 2019.

.3 Description of the asbestos containing building material debris encountered throughout the site and approximate GPS points is included in Appendix A (Phase I/II Environmental Site Assessment – Table 1).

.4 Notify Departmental Representative of friable or non-friable material discovered during Work and not apparent from Drawings, Specifications or report pertaining to Work. Do not disturb such material pending instructions from Departmental Representative.

1.9 SCHEDULING

.1 Hours of Work: perform Work during normal working hours.

1.10 PERSONNEL TRAINING

.1 Before beginning Work, provide Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene and work practices, and in use, cleaning and disposal of respirators and protective clothing.

.2 Instruction and training related to respirators includes, following minimum requirements:

.1 Fitting of equipment.
.2 Inspection and maintenance of equipment.
.3 Disinfecting of equipment.
.4 Limitations of equipment.

.3 Instruction and training must be provided by a competent, qualified person.

Part 2 PRODUCTS

2.1 MATERIALS

.1 Drop Sheets:

.1 Polyethylene: 0.15 millimetres thick.

.2 FR polyethylene: 0.15 millimetres thick woven fibre reinforced fabric bonded both sides with polyethylene.

.2 Wetting Agent: fifty (50) percent polyoxyethylene ester and fifty (50) percent polyoxyethylene ether mixed with water in a concentration to provide thorough wetting of asbestos-containing material.

.3 Waste Containers: contain waste in two (2) separate containers.

.1 Inner container: 0.15 millimetres thick sealable polyethylene waste bag.

.2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 millimetre thick sealable polyethylene bag.

.3 Labelling requirements: affix pre-printed cautionary asbestos warning in both official languages that is visible when ready for removal to disposal site.

.4 Tape: fibreglass – reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.

Part 3 EXECUTION

3.1 PROCEDURES

.1 Do construction occupational health and safety in accordance with Section 01 35 29.06 – Health and Safety Requirements.

.2 Before beginning Work, isolate Asbestos Work Area using, minimum, preprinted cautionary asbestos warning signs in both official languages that are visible at access routes to Asbestos Work Area.

.3 Wet materials containing asbestos to be cut, ground, abraded, scraped, drilled or otherwise disturbed unless wetting creates hazard or causes damage.

.1 Use garden reservoir type low – velocity fine – mist sprayer.

.2 Perform Work to reduce dust creation to lowest levels practicable.

.3 Work will be subject to visual inspection.

.4 Contamination of surrounding areas indicated by visual inspection clean-up of affected areas.

.4 Clean-up:

.1 Place dust and asbestos containing waste in sealed dust-tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste; wet and fold these items to contain dust, and then place in plastic bags.

.2 Clean exterior of each waste-filled bag using damp cloths or HEPA vacuum and place in second clean waste bag immediately prior to removal from Asbestos Work Area.

.3 Seal waste bags and remove from Site. Dispose of in accordance with requirements of Provincial and Federal Authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that the appropriate guidelines and regulations for asbestos disposal are followed.

.4 Perform final thorough clean-up of Work areas and adjacent areas affected by Work using HEPA vacuum.

END OF SECTION

DIVISION 31 – EARTHWORK

Part 1 GENERAL

1.1 SUMMARY

.1 Section Includes:

.1 Materials, applications and verification for excavating and backfilling.

.2 Sustainable requirements for construction and verification.

1.2 RELATED REQUIRMENTS

.1 Section 02 50 00 – Site Remediation.

1.3 PRICE AND PAYMENT PROCEDURES

.1 Measurement and Payment:

.1 Provide unit price per metric tonne to supply and place backfill material into excavations.

.2 Measurement and payment for excavation, load, transport and disposal of non-hazardous contaminated soil in accordance with Section 02 50 00 – Site Remediation.

1.4 REFERENCES

.1 American Society for Testing and Materials International (ASTM).

.1 ASTM D 698-[07e1], Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft^3) (600kN-m/m^3).

.2 Manitoba Provincial Standard Construction Specifications.

.1 Number 1001(I) June 2011 - Supplying and Placing Backfill.

.2 Number 1002 M February 1982 - Supplying and Placing Granular Backfill.

.3 Number 1003 M February 1982 - Supplying Coarse Granular Backfill.

1.5 SUBMITTALS

.1 Submit in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit to Departmental Representative five (5) days before mobilization to Site:

.1 Proof of the source and quality of the backfill material to be used as imported clean backfill. Departmental Representative to complete additional verification sampling of backfill material prior to being imported to the site in accordance with Section 02 50 00 – Site Remediation.

.3 Utility locate records.

1.6 QUALITY CONTROL

.1 Qualification Statement: submit proof of insurance coverage for professional liability.

.2 Submit Site Layout and supporting data at least seven (7) days prior to beginning Work.

.3 Keep design and supporting data on Site.

.4 Do not import clean backfill until written report of soil test results are reviewed and approved by the Departmental Representative.

.5 Complete backfill to grade with necessary compaction required to control soil settlement per excavation. Excavation backfills will not be completed until Departmental Representative confirms compaction and grading per excavation.

.6 Health and Safety Requirements:

.1 Do construction occupational health and safety in accordance with Section 01 35 29.06 – Health and Safety Requirements.

Part 2 PRODUCTS

2.1 MATERIALS

.1 Imported Clean Backfill:

.1 Selected material from excavation or other sources, approved by Departmental Representative for use intended, unfrozen and free from rocks larger than seventy-five (75) millimetres, cinders, ashes, sods, refuse or other deleterious materials.

.1 Granular material are to be used for excavations at the coal dump areas (APEC 1) to match existing surrounding conditions.

.2 Native soils are to be used in the pail dump area (APEC 2) with a topsoil cover that supports the natural regrowth of native vegetation to match existing surrounding conditions.

.2 Characterized to meet decontamination objectives. Must meet applicable CCME guidelines unless otherwise directed by the Departmental Representative.

Part 3 EXECUTION

3.1 EXAMINATION

.1 Evaluation and Assessment:

.1 Examine reports in Appendix A (Phase I/II Environmental Site Assessment, Former Sayisi Dene Village Site, Part Parcel A Plan #39799 PLTO, Churchill, Manitoba, Dillon Consulting, 2019) and Appendix B (Remedial Action Plan, Former Sayisi Dene Village Site, Part Parcel A Plan #39799 PLTO, Churchill, Manitoba, Dillon Consulting, 2021.).

.2 Before commencing Work verify locations of buried services on and adjacent to Site.

.3 Contractor to undertake their own private and public utility locates prior to undertaking any excavation at the Site.

.4 Located utilities to be clearly marked on Site with paint and flags.

.5 Contractor to survey utility locations and provide the Departmental Representative with an AutoCAD file of the survey results.

3.2 SITE PREPARATION

.1 Temporary erosion and sedimentation control:

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties, according to requirements of authorities having jurisdiction, sediment and erosion control plan, specific to Site, that complies with the Province of Manitoba Standard Construction Specifications – Erosion Control, or requirements of local jurisdiction, whichever is more stringent.

.2 Inspect, repair and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

.2 Protection of in-place conditions:

.1 Protect excavations from freezing.

.2 Keep excavations clean, free of standing water and loose soil.

.3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative's approval.

.4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

.5 Protect buried services and infrastructure that are required to remain undisturbed.

.3 Removal:

.1 Remove trees and vegetation, if and where required, within APECs #1 and APEC #2, designated on Drawing C-02. Disturbance or removal of vegetation shall be kept to a minimum and limited to the areas required for travel to the APECs and at the excavation locations.

3.3 EXCAVATION

.1 Excavate to lines, grades, elevations and dimensions indicated on Drawings and as directed by Departmental Representative.

.2 Restrict vehicle operations directly adjacent to open excavations.

.3 Protect slopes and banks and perform Work in accordance with Federal, Provincial and Municipal regulations whichever is more stringent.

.4 Do not obstruct flow of surface drainage or natural watercourses.

.5 Excavate as required to carry out Work.

.1 All excavated material to be treated as contaminated unless further testing (done and approved by the Departmental Representative) shows that the material excavated is not contaminated.

.2 See Section 02 50 00 – Site Remediation for the requirements for handling, stockpiling, testing and disposing of the contaminated soils.

.3 Notify Departmental Representative when excavations are complete.

.4 Excavation taken below depths shown without written authorization from Consultant shall be carried out at Contractor's expense.

.6 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

.7 Notify Departmental Representative when bottom of excavation is reached.

.8 Obtain Departmental Representative approval of completed excavation.

3.4 FIELD QUALITY TESTING

.1 Do not begin backfilling or filling operations until backfill material has been approved for use by Departmental Representative.

.2 Departmental Representative to confirm compaction of backfill per excavation.

3.5 STOCKPILING

.1 Refer to Section 01 35 13.43 – Special Project Procedures for Contaminated Sites.

3.6 DEWATERING

.1 Refer to Section 01 35 13.43 – Special Project Procedures for Contaminated Sites.

3.7 BACKFILLING

.1 Do not use backfill material which is frozen or contains ice, snow or debris.

.2 Remove snow, ice, construction debris, organic soil and standing water from spaces to be filled.

.3 Place backfill material in uniform layers not exceeding one hundred fifty (150) millimetres compacted thickness up to existing grade. Compact each layer before placing succeeding layer.

.4 Fill areas and compacted to not less than ninety-five (95) percent of corrected Standard Proctor maximum dry density.

3.8 GRADING

.1 Grade so that water will drain away from backfilled area to storm water collection features and other disposal areas approved by Departmental Representative.

.1 Grade to be gradual.

3.9 CLEANING

.1 Clean in accordance with Section 01 74 11 – Cleaning.

3.10 RESTORATION

.1 Upon completion of Work, remove waste materials and debris, trim slopes and correct defects as directed by Department Representative in accordance with Section 01 74 20 – Construction Waste Management Disposal.

.2 Restore disturbed areas to pre-remediation conditions.

.3 Complete backfilled coal dump excavations with granular fill to match existing conditions. In the area of the pail dump, excavations will be backfilled with native soils and topsoil to support the regrowth of native vegetation to match existing surrounding conditions.

END OF SECTION

APPENDIX A

PHASE I/II ENVIONMENTAL SITE ASSESSMENT, FORMER SAYISI DENE VILLAGE SITE, PART PARCEL A PLAN #39799 PLTO, CHURCHILL, MANITOBA, DILLO CONSULTING LIMITED AND OUTCOME CONSULTANTS, 2019

PUBLIC SERVICES AND PROCUREMENT CANADA

Phase I/II Environmental Site Assessment

Former Sayisi Dene Village Site
Part Parcel A Plan #39799 PLTO, Churchill, Manitoba

December 2019 – 19-1615

510 Cope Way
Suite 100
Saskatoon
Saskatchewan
Canada
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Telephone
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December 3, 2019

Public Services and Procurement Canada
Environmental Services and Contaminated Sites Management
Suite 310, 269 Main Street
Winnipeg, Manitoba R3C 1B3
Canada

Attention: Karen Hill
Senior Environmental Specialist

Phase I/II Environmental Site Assessment
Former Sayisi Dene Village Site
Part Parcel A Plan #39799 PLTO, Churchill, Manitoba

Dillon Consulting Limited and Outcome Consultants in a joint venture (Dillon-Outcome) are pleased to provide Public Services and Procurement Canada (PSPC) with the report for the Phase I/II Environmental Site Assessment conducted at the Former Sayisi Dene Village Site within Part Parcel A Plan #39799 PLTO, Churchill, Manitoba.

Should you have any questions, please contact the undersigned at (204) 453-2301, ext. 4023 or vkrahn@dillon.ca.

Sincerely,

DILLON CONSULTING LIMITED
AND OUTCOME CONSULTANTS IN JOINT VENTURE
(DILLON-OUTCOME)

Vanessa Krahn, M.Sc., P.Eng.
Project Manager

NLB:lw
Our file: 19-1615

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Executive Summary

Dillon Consulting Limited and Outcome Consultants in a joint venture (Dillon-Outcome) were retained by Public Services and Procurement Canada (PSPC) to conduct a Phase I/II Environmental Site Assessment (ESA) at the Former Sayisi Dene Village Site located in Churchill, Manitoba (herein referred to as the "subject site" or the "site"). The site is located at Part Parcel A Plan #39799 PLTO and is owned by the Federal Government. The objective of the Phase I/II ESA was to evaluate the environmental condition of the property prior to divestiture by the Federal Government to the Sayisi Dene First Nation.

The subject site consists of a lot covered by grass, gravel/fill material, bedrock that has been highly overgrown with trees and shrubs. Overall the site is situated in a low marshy region.

The subject site was previously developed in 1950 for residence buildings with approximately 60 residential units. During the site visit evidence of 57 housing units was encountered in varying condition. The remains of the housing units consisted of concrete footings and foundations with several fiberglass tanks (or remnants of fiberglass tanks) thought to hold potable water. Miscellaneous debris such as glass, cans, wood, construction and metal debris were encountered throughout the site. The Village was in existence until 1973 when occupants left and the buildings were either removed and transferred to Goose Creek or burned. The subject property currently has one metal building existing that is used as a sweat lodge and a tent pole structure used for a dog mushing business. During the site visit approximately 40 coal piles were observed throughout the site. Reportedly this coal was used to heat the residential homes that used to be present on the subject site.

The following is a summary of the findings of Areas of Potential Environmental Concern (APECs) and Contaminants of Potential Concern (COPCs) identified during the Phase I ESA:

APEC	COPC	**Details and Rationale**
1 – Coal Dust Piles	PHCs Polycyclic Aromatic Hydrocarbons (PAHs) Metals	Approximately 40 coal dust piles were encountered throughout the site. There is a potential for impacts related to the long term storage of the material on the site.
2 – Pail Dump Area	PHCs volatile organic compounds (VOCs) Metals	There is the potential for impacts due to the area where multiple pails and drums were located in the northeastern portion of the site. Due to the condition of the pails/drums, the contents are unknown.
3 – Asbestos-Containing Building Materials	Asbestos	During the site visit miscellaneous building material debris was encountered including suspect asbestos-containing materials (ACMs).

A Phase II ESA was completed which included a limited surficial soil sampling based on the findings of the records review and identification of APECs. The sampling program was to identify potential impacts

observed that were believed to be surficial, shallow soil sample (<0.3 m) to determine the presence/absence of limited surficial contamination. The following is a summary of the findings and recommendations for the APECs identified during the Phase I/II ESA:

APEC 1 Coal Dust Piles

A coal dust material was observed in piles throughout the site. Based on discussions with interviewees, coal was used to heat the residential homes until 1973 when the occupants left. The coal material was historically placed in piles in front of the residential housing prior to use. During the site visit, evidence of at least 40 coal pile remains were encountered with samples collected for analysis of benzene, toluene, ethylbenzene, and xylenes (BTEX), PHC F1 to F4, PAHs, and metals at 26 of the locations. Analytical concentrations indicated that soil exceedances for at least one parameter of BTEX, PHC F1-F4, PAHs, and metals were encountered in 25 of the 26 locations. One location (SS19-4) did not contain concentrations greater than the assessment criteria with the exception of the metal parameter selenium in which the detection limit was raised due to sample matrix interference. However, based on the percentage of exceedances at the subset samples it should be assumed that the encountered 40 coal piles have concentrations greater than the assessment guidelines. The volume of the coal pile remnants and anticipated impacted soil was minimal (less than 0.5 m^3) with the exception of two coal piles that were mounded (CP11 and CP 39). Based on the observed coal pile dimensions it is estimated that there is approximately 50 m^3 of impacted material at the site resulting from the coal dust piles. It is recommended that the coal dust piles be removed from the site and properly be disposed of followed by environmental sampling to ensure remaining impacts have been removed prior to backfilling with clean fill, if required.

APEC 2 Pail Dump Area

During the site visit a pail dump area was encountered in the northeastern portion of the site. One soil sample (SS19-29) was collected for analysis of BTEX, PHC F1-F4, VOCs, and metals. Concentrations greater than the assessment guidelines were encountered for PHC F1 and PHC F2. The laboratory detection limits were greater than the assessment criteria for toluene and trichloroethene at this location. It is recommended that the pails, drums, and impacted soil (estimated at 20 m^3) encountered be removed from the site and properly be disposed of as well as environmental sampling to confirm remaining impacts have been removed prior to backfilling with clean fill, if required.

APEC 3 Asbestos-Containing Building Materials

During the site visit miscellaneous building material debris was encountered including suspect ACMs. Sixteen (16) samples of building materials were collected for analysis to determine the presence of asbestos. The laboratory analysis determined that eight (8) of the samples were ACMs (greater than 1.0% asbestos) and three (3) samples had trace asbestos. Since the Manitoba regulations indicate an ACM as any non-friable material that contains 1.0% or more asbestos, the asbestos present in the non-friable building material is considered a minor component of the material and thus, not considered a regulated asbestos-containing material. It is recommended that fragments of vinyl floor tiles and "Transite" cement board be removed from the site following Type 1 (Low Risk) asbestos abatement

procedures. Type 1 (low risk) abatement procedures are a classification of asbestos-related work for removing non-friable asbestos containing materials from a building/structure without breaking, cutting, drilling, abrading, etc. the material. These non-destructive procedures provides a prescribed abatement method for an abatement contractor to safely remove non-friable asbestos-containing materials. Further information in regards to this type of asbestos-related work procedures can be found in the PSPC document Asbestos Management Standard (June 5, 2017, updated October 24, 2018)

Miscellaneous Debris

Miscellaneous debris was encountered throughout the site including broken glass, cans, metal, miscellaneous construction debris, ovens, bed frames, etc. Although not envisioned to be an area of environmental concern, for public safety and aesthetic reasons the miscellaneous debris is recommended to be removed from the site.

This report was prepared by Dillon-Outcome for the sole benefit of our Client, PSPC. The conclusions reflect Dillon's judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report or any reliance on or decisions made based on it are the responsibilities of such third parties. Dillon-Outcome accepts no responsibilities for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

1.0 Introduction

Dillon Consulting Limited and Outcome Consultants in a joint venture (Dillon-Outcome) were retained by Public Services and Procurement Canada (PSPC) to conduct a Phase I/II Environmental Site Assessment (ESA) at the Former Sayisi Dene Village Site located in Churchill, Manitoba (herein referred to as the "subject site" or the "site"). The site is located approximately 4.5 km southeast of the Town of Churchill with the legal description of Part Parcel A Plan #39799 PLTO and is owned by the Federal Government. The site location is shown in Figure 1 (appended). The Sayisi Dene First Nation resided on the property containing approximately 60 housing units from 1956 to approximately 1973. The objective of the Phase I/II ESA was to identify and characterize contaminants of potential concern (COPC) and Areas of Actual or Potential Environmental Concern (APECs) associated with the property prior to divestiture by the Federal Government to the Sayisi Dene First Nation, who have requested the site be maintained as a cultural/historical site with the building foundations and roadways to remain intact. Photographs taken during the site visit are presented in Appendix A.

1.1 Objectives and Scope of Work

The objective of the Phase I/II ESA was to assess whether sources, or potential sources, of contamination are present. Contamination is defined as "the presence of a substance of concern, or a condition, in concentrations above appropriate pre-established criteria in soil, sediment, surface water, groundwater, air, or structures" (Canadian Standards Associated (CSA), 2016).

To fulfil the objective of the Phase I/II ESA, the following scope of work was agreed to:

- Review historical and current site records that were reasonably attainable for the property and surrounding area;
- Interview of persons knowledgeable with respect to past and current uses of the property and/or adjacent properties;
- Site visit to observe the site and surrounding properties, looking for evidence of actual or potential contamination and activities or conditions that could result in contamination including off-site or adjacent activities;
- Surficial soil sampling at the coal dust APEC and any other APECs identified based on the records review or observed during the site visit that are believed to be surficial in nature;
- Evaluation of the findings and reporting; and,
- Recommendations for future work at each APEC identified, if applicable.

1.2 Regulatory Framework

This Phase I ESA was performed in general accordance with the Phase I ESA guidance document produced by the Canadian Standards Association (CSA Z768-01, reaffirmed in 2016). This report is based on visual observations made during the site visit, interviews with available persons, a review of historical records, and requests for information filed with government or other regulatory agencies. The Phase II

ESA surficial soil sampling was conducted based on the guidance document produced by the Canadian Standards Association (CSA Z769-00, re-affirmed in 2012).

Regulatory requirements for the surficial soil sampling include the following:

- Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines for soil; and
- CCME Canada Wide Standards for Petroleum Hydrocarbons in Soil (2008).

The bulk asbestos sampling program was conducted in general accordance with PSPC Asbestos Management Standard. For the purposes of managing worker exposure during building maintenance, renovation and demolition, the PSPC Asbestos Management Standard references local jurisdictional regulations with respect to defining an ACM.

Regulatory requirements for the asbestos sampling program include the following:

- Public Services and Procurement Canada Asbestos Management Standard, June 2017 (or most current version);
- Manitoba Workplace Safety and Health Regulation, M.R. 217/2006, (Parts 2, 6, 33, 35, 36, and 37); and
- Guide for Asbestos Management, SAFE Work Manitoba, (May 2017).

2.0 Phase I ESA Methodology

This section describes the methods used during the Phase I ESA to conduct the historical records review, site visit, and interview activities.

2.1 Records Review

The records review consisted of requesting and reviewing information available from PSPC and other government, public and private agencies or parties. Information was reviewed from the following sources, if available at the time of reporting.

Agencies, Information, Source Documents and Publications

- Physical setting information including topography, hydrology, surficial and bedrock geology, and soil mapping via Environmental Risk Information Services (ERIS);
- Aerial photographs via Canada Map Sales;
- Land title certificates via ERIS;
- Federal, provincial, and private databases via ERIS;
- Provincial file search request via Manitoba Sustainable Development (MSD);
- Treasury Board of Canada – Federal Contaminated Sites Inventory (online);
- Water well records via the Groundwater Information Network (GIN); and,
- Previous Environmental Reports/Documents.

2.2 Interviews

The interview portion of the Phase I ESA consisted of requesting PSPC to identify the person(s) thought to be the most knowledgeable of the history and operation of the subject property and adjacent properties. The recommended individuals were then interviewed to obtain information relevant to the environmental condition of the subject properties. Information obtained during the interviews were incorporated into the appropriate report sections.

2.3 Health and Safety Plan

Dillon-Outcome developed a health and safety (H&S) Plan for on-site activities. An H&S meeting was held at the beginning of each day on-site, and the H&S requirements for site work were reviewed with members of the field team, including sub-contractors. Field personnel reviewed the H&S Plan and signed off prior to the start of the program. The H&S Plan included:

- Identification and mitigation of potential hazards based on-site activities;
- Description of safe work practices and procedures, including remote wilderness work;
- Description of personal protective equipment (PPE)/safety levels;
- Identification of safety and first aid requirements; and,
- Identification of emergency response procedures.

Nature 1st Wildlife Monitoring was on-site to provide Wildlife Monitoring during site activities.

2.4 Site Visit

The site visit was conducted on October 1-4, 2019 by Shane Chapman, C.E.T. of Dillon-Outcome. Activities conducted during the site visit included:

- Observation of the grounds of the subject site;
- Observation of the properties adjacent to the site (to the extent possible) to assess land use, as could be viewed from the site and adjoining public lands;
- Collection of Global Positioning System (GPS) Coordinates;
- Surface soil sampling program and the coal pile locations and other determined APECs; and
- Sampling of suspected asbestos-containing building materials based on suspect ACMs encountered at the site.

3.0 Phase I ESA Results

3.1 Site Description

3.1.1 Subject Property Description

The subject site is located within Part Parcel A Plan #39799 PLTO in Churchill, Manitoba. The site is approximately 62 acres and consists of a cleared lot covered by grass, gravel/fill material, bedrock and has been highly vegetated with trees and shrubs. Site details are shown on Figure 2 (appended) and described in Table 1 (appended).

3.1.2 On-site Buildings and Structures

The subject site was previously developed in 1950 for residence buildings with approximately 60 residential units. During the site visit evidence of 57 housing units was encountered in varying condition.

Descriptions of the building foundations or remnants of the foundation and debris encountered is shown on Figure 2 (appended) and described in Table 1 (appended). The remains of the housing units consisted of concrete footings and foundations with several fiberglass tanks (or remnants of fiberglass tanks) thought to hold potable water. Miscellaneous debris such as glass, cans, wood, construction and metal debris were encountered throughout the site. The Village was in existence until 1973 when occupants left and the buildings were either removed and transferred to Goose Creek or burned. The subject property currently has one metal building existing that is used as a sweat lodge and a tent pole structure used for a dog mushing business. The former residence buildings were heated via coal burning and the existing tent pole structure is heated via propane.

3.1.3 Adjoining Properties

The subject site is bordered to the north/northeast by a Manitoba Hydro substation and a CN rail line that has historically transported fuel and other materials to the south and to the west. The north, west, south and east of the site is heavily forested with a metal recycling facility located east of the forested area. The subject site and surrounding properties are presented on Figure 1 (appended).

3.2 Regional Characteristics

3.2.1 Soil, Topography and Drainage

The elevation of the subject site is approximately 8 metres (m) above sea level (asl) and the local surface topography of the site is sloping to the north towards the Rosabella and Isabelle Lake located approximately 1.75 km and 2.0 km, respectively from the site. Overall the site is situated in a low marshy region. Regional surface topography slopes towards Hudson Bay approximately 3.5 km north of the site (Natural Resources Canada, 2019).

The bedrock geology unit for the area is identified as Phanerozioc from the Ordovician period, which is comprised of Caution Creek and Chasm Creek Formations – limestone, dolomitic and argillaceous and Red Head Rapids Formations – dolomite. The surficial geology in the area is mapped as Marginal Glaciomarine Sediments, including littoral sand and gravel, beach ridges, spits, bars; formed by waves at the margin of the glacial Tyrell Sea and present-day Hudson Bay (ERIS Physical Setting Report, 2019). The ERIS physical setting report is provided in Appendix B.

3.2.2 Hydrology/Hydrogeology

The subject site is located in the Hudson Bay Basin according to the ERIS Physical Setting Report (2019). The Hudson Bay Basin is a drainage watershed that is located in northern North America and joins waters spanning an area of approximately 3,800,000 square kilometres and extends over five provinces from Alberta to Quebec and the Northwest Territories and Nunavut (Government of Canada, November 2019).

3.2.3 Water Supply/Groundwater Conditions

No potable water wells or oil and gas wells were identified on-site. According to the GIN, the nearest potable well is approximately 200 km southeast of the subject site (Groundwater Information Network, 2014). Based on interviews of those knowledgeable on the site it was believed that historically, potable water was brought in and stored in tanks on-site. Fiberglass tanks (or remnants of fiberglass tanks) thought to hold potable water was observed on the site. The current business (dog musher) brings in potable water in containers on a daily basis as required.

3.2.4 Climatic Conditions

The site is located within the Hudson Plains ecoregion of Manitoba. This ecoregion is characterized by short, mild summers and long, harsh winters, with an annual mean temperature of approximately -7°C and annual mean precipitation of 431 mm in Churchill (The Weather Network, 2019).

3.3 Historical Records Review

3.3.1 Chain of Title Search

A legal property title search of the property was conducted by ERIS as part of the Phase I ESA. The search returned no results for the site. The available title search documentation is provided in Appendix C.

3.3.2 City Directories

ERIS was retained to conduct a City Directory search for the site and adjoining properties. The search returned no results for the site or adjacent properties searched.

3.3.3 Aerial Photographs

Aerial photographs obtained from Canada Map Sales were reviewed as part of this Phase I ESA. Historical aerial photographs displaying the subject site and the surrounding area from 1947, 1956, 1959, 1977 and 1986 are presented in Appendix D. Google Earth images for 2003, 2014 and 2019 were also reviewed. A summary of the review of the available aerial photographs and images is presented in Table 3-1. It is noted that the scale and resolution of the photographs varied and did not allow for a complete detailed evaluation of the surface conditions at the site or adjacent properties.

Table 3-1: Aerial Photograph Review Summary

Year	Observations
1947, 1956 and 1959	The site is undeveloped.
1977	The site appears to have been developed with residence buildings constructed on-site. Roadways have been established.
1986	No changes were observed on the subject site. The Manitoba Hydro substation has been developed northeast of the site.
2003	All residential structures appear to have been removed with exception of the footings. One building appears in the west central portion of the site.
2014	The subject site remains the same.
2019	One building appears in the east portion of the subject site towards the entrance.

3.3.4 Fire Insurance Plans and Inspection Reports

Fire insurance mapping, dated 1959, were requested for Churchill, Manitoba but no fire insurance maps were available for the subject site.

3.3.5 Previous Environmental Reports

PSPC provided two historical reports regarding the property a 1993 Property Transfer Assessment and a 2000 Churchill Inspection Reports:

Property Transfer Assessment – Unsurveyed Federal Lands: OIC 857/52 Churchill, Manitoba

The assessment report provides historical background on the property and that that the Village was established in the 1950s and existed for approximately 15 years when occupants left during the summer of 1973. Most of the houses were torn down, removed, or burned. The report indicates that septic tanks were removed from the ground and remained on-site as well as large amounts of miscellaneous construction debris. A large amount of coal dust was noted on the site as coal was historically unloaded in front of the residents' houses to be used as a heating source. Building materials and insulation collected from the site did not contain ACM; however, other building materials such as siding and floor tiles were suspect ACMs. Coal dust samples taken from the site indicated trace amounts of heavy metals such as lead and zinc but not at levels anticipated to pose a threat to human health or the environment.

The assessment report recommended the removal of the building foundations and miscellaneous debris, contouring the site for natural re-vegetation, and environmental assessment of any clean up.

PWGSG Churchill Lands – *July 2000 Manitoba Conservation Inspection Report*

A 2000 inspection report indicated that Sayisi Dene Village had requested the site be maintained as a cultural and historical site. Manitoba Conservation recommended that the coal dust piles be removed from the site and that surface debris such as glass, wood, and metal be removed from the site. Historical reports are provided in Appendix E.

3.3.6 Manitoba Sustainable Development Access to Information Request

A file search request was submitted to MSD on November 4, 2019 requesting historical information relating to environmental concern including violations, reported spills, air emissions, sewer discharges, approvals and/or compliance orders issued at the subject site. The file search request was received on November 21, 2019 and indicates that the site is not listed on file for historical information relating to any environmental concern. The file search is included in Appendix F.

3.3.7 EcoLog ERIS Databases

ERIS was retained to conduct a search of federal, provincial, and private databases for the site and areas within 250 m of the site. It should be noted that the extent of the historical information available varies with each database and the information in the databases is only current to what is publicly available. The databases searched are listed below:

- Automobile Wrecking and Supplies;
- Certificates of Approval;
- Chemical Register;
- Compressed Natural Gas Stations;
- Enforcement Actions;
- Contaminated/Impacted Sites;
- Drill Holes;
- Dry Cleaning Facilities;
- Environmental Effects Monitoring;
- ERIS Historical Searches;
- Environmental Issues Inventory System;
- Federal Convictions;
- Contaminated Sites on Federal Land;
- Fuel Storage Tanks;
- Bulk Fuel Distributors;
- Waste Generators Summary;
- Greenhouse Gas Emissions from Large Facilities;
- Indian & Northern Affairs Fuel Tanks;
- Manure Storage Facilities;
- Canadian Mine Locations;
- Mineral Occurrences;
- Manitoba Oil and Gas Wells;
- National Analysis of Trends in Emergencies System (NATES);
- National Defense and Canadian Forces Fuel Tanks;
- National Defense and Canadian Forces Spills;
- National Defense and Canadian Waste Disposal Sites;
- National Energy Board Pipeline Incidents;
- National Energy Board Wells;
- National Environmental Emergencies System (NEES);
- National PCB Inventory;
- National Pollutant Release Inventory;

- Oil and Gas Wells;
- Canadian Pulp and Paper;
- Inventory of PCB Storage Sites;
- Parks Canada Fuel Storage Tanks;
- Manitoba Pits and Quarries;
- Waste Receivers Summary;
- Retail Fuel Storage Tanks;
- Scott's Manufacturing Directory;
- Manitoba Spills;
- Transport Canada Fuel Storage Tanks;
- Waste Disposal Site Inventory; and,
- Water Well Inventory.

The search findings for the subject site did not find any records for the above selected databases. The ERIS report is attached as Appendix G.

3.4 Interviews

The interview portion of the Phase I ESA consisted of interviewing the following individuals with knowledge of the site:

- Mr. Dan Sonmor, Manager Environmental Services – PSPC;
- Mr. Kelly Turcotte, Operator for dog musher on the subject site; and
- Ms. Florence Hamilton, Sayisi Dene Member, former resident.

The interview with Mr. Sonmor was conducted through a teleconference on September 30, 2019. Questions were asked of the interviewee to obtain information relevant to the past and current uses of the site. During the interview, Mr. Sonmor reported that the site was previously used as residential housing for transposed peoples. A couple of years ago, a dog musher camp was established at the entrance of the site. The residential homes used coal for heating purposes and coal dust piles remain on the subject site. The subject site is fairly swampy in vegetated areas and the roadways are gravel filled.

The interview with Mr. Kelly Turcotte was conducted through a teleconference on October 1, 2019. Questions were asked of the interviewee to obtain information relevant to the past and current uses of the site. During the interview, Mr. Turcotte reported that he has operated on the subject site for the past 4 years and he is the only employee of the dog musher business. He reported there is a sweat lodge on the subject site that has been in operation for the past 20 years. Any waste materials he generates are removed from the site, he has a portable self-contained outhouse and he brings water on-site for drinking purposes. He currently uses propane for heating purposes and his current building structure is a pole tent. He did bring in gravel from a gravel pit for his pole structure. The gravel was not tested but he does not believe it would be contaminated.

The interview with Ms. Hamilton was conducted through teleconference on October 1, 2019. Questions were asked of the interviewee to obtain information relevant to the past and current uses of the site. During the interview, Ms. Hamilton indicated the sweat lodge on the subject site, which is a tin building, is operated by local men and she was not sure how often it was in operation. When residents were residing in the homes, water was brought in as there was no running water available. She believes

material would have had to of been brought in for the roads since the subject site is low lying and muskeg. She did indicate a metal landfill area is located east of the site.

Information obtained during the interviews has been incorporated into the following report sections and provided in Appendix H.

3.5 Site Visit

The site visit was conducted on October 1-4, 2019 by Shane Chapman, C.E.T. of Dillon-Outcome to identify visual or other physical evidence of actual or potential sources of environmental impact from current or historical site use, as well as surrounding land uses. Site photographs are presented in Appendix A.

3.5.1 Site Description

The site is within Parcel A Plan #39799 PLTO encompassing a total land area of approximately 62 acres. The site is currently overgrown and being occupied by a sweat lodge and a dog mushing business. Historically 60 building foundations were reported, 57 of those locations were confirmed during the site visit. GPS points, as well as any debris encountered near the building foundation is included in Table 1 (appended). Miscellaneous debris such as glass, cans, wood and metal debris were encountered throughout the site.

3.5.2 Site Services and Utilities

The site does not have any municipal water or sanitary services. No water meter was observed at the time of the site visit. Overhead electrical lines are located along the roadway on the east side of the site. The former residential homes used to use coal as their heat source. The dog mushing business is heated with a propane tank.

3.5.3 Fuel and Storage Handling

There were no aboveground or underground fuel storage tanks observed on the subject site or reported at the site during the interviews. According to the ERIS report, there are no aboveground storage tanks located within 250 metres of the subject site.

3.5.4 Solid Waste Management

Miscellaneous debris was encountered throughout the site. Current solid waste produced at the site by the dog mushing business is taken off-site for disposal. Based on interviews it was thought that solid waste was brought off-site for disposal.

3.5.5 Fill Materials

The gravel roads and base for the dog musher's pole tent were built using fill imported from an unknown site.

3.5.6 Spills, Stained Areas and Stressed Vegetation

No hazardous liquid spills were identified during the site visit. Remains of coal dust piles were encountered throughout the site.

3.5.7 Special Attention Items

Materials such as asbestos, lead, ozone depleting substances (ODS), mercury, urea formaldehyde foam insulation (UFFI), radon, excessive noise and electric/magnetic fields may be of special significance, if present, because of heightened public concern regarding their use.

3.5.7.1 Polychlorinated Biphenyls (PCBs)

PCBs are commonly associated with dielectric fluids within electrical equipment manufacture in Canada prior to approximately 1979. PCBs are typically present in transformers and fluorescent light ballasts.

No registered PCB sites were listed on the ERIS report and no suspect containing PCB products were observed on the subject site.

3.5.7.2 Asbestos-Containing Materials (ACMs)

Due to its good insulation and fire retardant properties, asbestos was used in building materials from the 1920s to 1970s. The health risk associated with asbestos occurs when asbestos fibres are released from various materials into the ambient air. These fibres can then be inhaled by humans and ecological receptors in the area, potentially causing negative impacts on their respiratory systems.

During the site visit asphalt roof shingles, vinyl floor tiles and tar building paper materials were observed throughout the site. Reportedly these materials were from the residential homes that used to be present on the subject site. Dillon-Outcome recovered samples of select building materials and submitted them for laboratory analysis to determine the presence of asbestos. Results of these findings are found in **Section 4.0**.

3.5.7.3 Lead and/or Lead Based Paint

Paint manufactures historically added heavy metals, including lead, to paint because of their desirable properties, such as rust prevention or as a bactericide. Lead was also historically used in water pipes and pipe fitting solder and roof flashings.

As the majority of the buildings had been removed in the 1970s building materials that may have contained lead are expected to have been removed from the site.

3.5.7.4 Ozone Depleting Substances (ODS) and Halocarbons

ODS such as Chlorofluorocarbons (CFCs) are manufactured compounds used in a variety of applications, such as air-conditioning coolants, industrial solvents, foam products, etc. Each province in Canada has

passed legislation requiring mandatory recovery and reclamation of refrigerants during the maintenance of air-conditioning and cooling equipment.

No ODS and halocarbons were observed or reportedly have been used on the subject site.

3.5.7.5 Urea Formaldehyde Foam Insulation (UFFI)

UFFI was developed in Europe in the 1950s. It was used in Canada, primarily between 1977 and 1980, when it was banned from use.

No UFFI was observed or reportedly has been used on the subject site.

3.5.7.6 Radon

Radon is likely to accumulate in unventilated space, such as a basement or crawlspace.

No potential sources of radon gas were noted at the site. The ERIS database search did not note any sources of radon on or surrounding the site. A search of the Radon Potential Map of Canada places the Former Sayisi Dene Village in a low risk area for radon presence. (Radon Environmental Management Corporation, 2011).

3.5.7.7 Noise and Vibration

No excessive noise sources of potential concern were noted during the site visit.

3.5.7.8 Magnetic Fields

There were no electric/magnetic fields of potential concern noted during the site visit.

3.5.7.9 Radioactive Materials

No potentially radioactive materials were observed during the site visit.

3.5.7.10 Mercury

As it has been reported that the historical buildings were heated by coal, mercury containing thermostats are not expected to have occurred at the site. No mercury containing items were observed during the site visit.

3.5.8 Chemical and Hazardous Material Management

The site has historically been used for residential purposes. It is likely that household cleaners and landscaping chemicals may have historically been used. Several metal drums and pails were encountered in an area in the northeastern section of the site during the site visit and the contents are unknown. Several other containers were encountered at the site; however, these containers were anticipated to be used for other purposes (storage of sand or storage of garbage).

3.5.9 Wastewater

No wastewater discharges were identified during the site visit.

3.5.10 Air Emissions and Odours

There were no air emissions or odours observed or identified at the subject site during the time of the site visit. No issues were reported.

3.5.11 Mechanical Equipment

There was no mechanical equipment observed on-site.

3.5.12 Drains, Catch Basins and Sumps

There were no drains, catch basins and sumps identified on-site or mentioned in the interview.

3.5.13 Pits or Lagoons

No pits or lagoons were observed or have reportedly existed on-site, a retention pond is located to the north of the site.

3.5.14 Watercourses, Ditches, or Standing Water

During the site visit, a high water table and standing water was observed throughout the site. A small stream/ditch was encountered on the site.

3.5.15 Mould

Mould growth was not observed on building materials at the subject site.

3.5.16 General Wildlife Observation

No wildlife was observed during the site visit.

3.5.17 Unidentified Substances

During the site visit approximately 40 coal piles were observed throughout the site. Reportedly this coal was used to heat the residential homes that used to be present on the subject site.

3.5.18 Observation of Adjoining Properties

A description of the surrounding adjacent properties is provided in Table 3-2 below. Observations of the adjoining properties were made from the site boundaries limiting the assessment of these properties.

Table 3-2: Summary of Adjacent Properties

Location	Description
North	Directly north of the subject site is a heavily forested vacant area followed by a retention pond. North east of the subject site is a Manitoba Hydro substation.
East	Directly east of the subject site is a roadway followed by a forested vacant area and a metal scrap yard.
South	Directly south of the subject property is a CN Rail line followed by a heavily forested area.
West	Directly west of the subject site is a CN Rail line followed by a heavily forested area.

3.6 Areas of Potential Environmental Concern

Based on a review of the documents provided, site observations, and interviews, there are three APECs as summarized in Table 3-3.

Table 3-3: Summary of Phase I ESA Findings

APEC	COPC	Details and Rationale
1 – Coal Dust Piles	PHCs Polycyclic Aromatic Hydrocarbons (PAHs) Metals	Approximately 40 coal dust piles were encountered throughout the site. There is a potential for impacts related to the long term storage of the material on the site.
2 – Pail Dump Area	PHCs volatile organic compounds (VOCs) Metals	There is the potential for impacts due to the area where multiple pails and drums were located in the northeastern section of the site. Due to the condition of the pails/drums, the contents are unknown.
3 – Asbestos-Containing Building Materials	Asbestos	During the site visit miscellaneous building material debris was encountered including suspect ACMs.

4.0 Asbestos-Containing Materials Sampling

4.1 Sampling Program

During the site assessment, Dillon-Outcome identified suspected ACMs within the building material debris observed at the site. Upon approval of PSPC, a targeted sampling program was developed to recover samples of suspected ACMs that were observed on the surface of the ground at the site. Dillon-Outcome did not conduct an intrusive sampling program that would have included excavation or digging with the footprint of the former structures.

Representative samples of building materials suspected of containing asbestos were collected by hand, using single-use nitrile gloves for each sample placed in clean plastic bags and transported by courier to EMSL Canada (EMSL) in Mississauga, ON, for analysis. EMSL Canada is certified under the National Voluntary Laboratory Accreditation Program (NVLAP) for asbestos analysis. NVLAP is a National Institute of Standards and Technology program based in the USA which provides an unbiased third party test and evaluation program to accredit laboratories for asbestos fibre analysis. Samples were analyzed to determine asbestos type and percentage content using Polarized Light Microscopy (PLM) and dispersion staining techniques in accordance with the United States Environmental Protection Agency (USEPA 600) methodologies. Building materials such as asphalt shingles and vinyl floor tiles where the asbestos fibres are tightly bound to an asphalt or vinyl matrix, are analyzed using PLM and Non-Friable Organically Bound (NOB) Prep. The NOB method reduces organic and other non-ACMs in the samples in order for asbestos fibres to be more visible under the microscope.

The PLM laboratory detection limit is < 1.0 %, which can be decreased by utilizing the point count approach, an analytical technique used to determine the quantity of asbestos fibres in a material. The EPA 600 PLM methodology contains a 400 point count approach which has a detection limit of 0.25% and a 1000 point count approach which has a detection limit of 0.1%.

Trace quantities of asbestos are reported when non-detection is not achieved, and returned results of < 1.0% for non-friable asbestos and < 0.1% for friable asbestos. Trace quantities of asbestos are considered to be non-ACM and are not regulated as per the Manitoba Workplace Safety and Health *Regulation.*

The asbestos sampling included an assessment of both friable and non-friable asbestos building materials. The term friable is applied to a material that can be readily reduced to dust or powder by hand or moderate pressure. Asbestos materials that are friable have a much greater potential to release airborne asbestos fibers when disturbed.

Bulk sampling protocols followed the PSPC Standard, which indicates requirements for the number of samples to collect for each homogeneous material. This follows the requirements outlined in Section 1.3

– Bulk Sample Collection of the SAFE Work Manitoba Guide for Asbestos Management. By virtue of collecting multiple samples (minimum of three) of each homogenous materials observed in accordance with the PSPC Standard, quality control and quality assurance of the laboratory is ensured during the sampling work.

Positive stop was applied at the lab whereby several samples of the same material are collected and submitted to the lab as a homogeneous group (i.e., AS-02A, AS-02B and AS-02C samples of "Transite" cement board) and each sample in the series is analyzed until one of the samples tests positive for asbestos (i.e., 0.1% (friable) or 1.0% (non-friable) or greater as defined by Workplace Safety and Health Regulations (MR 217/2006)). Sample AS-02A was found to contain 15% Chrysotile asbestos, therefore, samples AS-02B and AS-02C were not analyzed due to the application of positive stop by the lab.

4.2 Results

Bulk samples of building material debris suspected to contain asbestos were collected at the site. Dillon-Outcome collected a total of 16 samples from the site and sent via courier to EMSL for analysis. A total of eight samples (including samples where positive stop was applied) were identified to contain asbestos above applicable guidelines. All samples were recovered from damaged building materials that would be considered to be in poor condition.

Laboratory certificates of analysis have been provided in Appendix I. Site plans indicating sample locations are provided in Figure 2 (appended). Photographs of representative samples are provided in Appendix A. The laboratory analytical results are summarized in the tables below.

Table 4-1: Summary of Asbestos-Containing Materials at the Former Sayisi Dene Village Site, Churchill, MB

Sample #	**Sample Description**	Friability	Asbestos %
AS-01A – Floor Tile	Vinyl floor tile – gray	Non-friable	0.63% Chrysotile
AS-01A – Mastic	Mastic associated with floor tile - black	Non-friable	ND
AS-01B – Floor Tile	**Vinyl floor tile** – blue	Non-friable	**1.2% Chrysotile**
AS-01B – **Mastic**	**Mastic associated with floor tile** - black	Non-friable	4**% Chrysotile**
AS-01C – Floor Tile	Vinyl floor tile – beige	Non-friable	0.70% Chrysotile
AS-01C – **Mastic**	**Mastic associated with floor tile** - black	Non-friable	**2% Chrysotile**
AS-01D – Floor Tile	Vinyl **floor tile** – beige	Non-friable	**1.1% Chrysotile**
AS-01D – **Mastic**	**Mastic associated with floor tile** - black	Non-friable	**1% Chrysotile**
AS-01E – Floor Tile	Vinyl floor tile – gray	Non-friable	0.63% Chrysotile
AS-01E – Mastic	Mastic associated with floor tile - black	Non-friable	ND
AS-02A	"Transite" cement board	Non-friable	**15% Chrysotile**
AS-02B	"Transite" cement board	Non-friable	PS
AS-02C	"Transite" cement board	Non-friable	PS

Sample #	**Sample Description**	Friability	Asbestos %
AS-03A	Asphalt roof shingle - green	Non-friable	ND
AS-03B	Asphalt roof shingle - red	Non-friable	ND
AS-03C	Asphalt roof shingle - green	Non-friable	ND

Bold – indicates ACM 0.1% (friable) or 1.0% (non-friable) or greater as defined by Workplace Safety and Health Regulations (MR 217/2006).
ND – None Detected.
PS – Indicates positive stop analysis was applied to the sample. The sample was not analyzed and was presumed to contain asbestos based on laboratory analysis result of previous sample. Positive stop was applied to two (2) samples.
___ - Underline denotes trace asbestos detected

There were samples of building materials where the analytical results indicated that trace asbestos (< 1.0% non-friable) was detected in some or all of samples of the sample set (e.g., samples AS-01A-Floor Tile, AS-01C – Floor Tile and AS-01E – Floor Tile). Since the Manitoba regulations indicate an ACM as any non-friable material that contains 1.0% or more asbestos, the asbestos present in the non-friable building material is considered a minor component of the material and thus, not considered a regulated asbestos-containing material.

Separation of vinyl floor tiles and mastic is very difficult and where one of these components are determined to be ACM, the entire piece of material should be handled and disposed as ACM. Due to the difficulty in verifying the colour and size of vinyl floor tiles within other building material debris, all vinyl floor tiles or fragments should be handled and disposed as ACM. The Transite cement board was determined to be ACM and therefore, should be handled and disposed of properly.

The findings presented within this report do not reflect potential ACMs in areas not accessed.

5.0 Phase II ESA Methodology

5.1 Sampling Program

The scope of work for the Phase I/II ESA included a limited surficial soil sampling program based on the findings of the records review and identification of APECs. Soil sampling was undertaken at APECs that were thought to be surficial in nature (<0.3 m) to determine the presence/absence of contamination. Based on location, applicable site APECs, headspace vapour screening, as well as the field observations (i.e., visible staining, site geology, depth, and/or physical location), selected soil samples were submitted for laboratory analysis.

Soil samples were collected for PAHs, BTEX, petroleum hydrocarbons (PHCs) fractions F1 to F4, VOCs and metals depending on the APEC. Soil samples that were collected for analysis of BTEX and F1 were field preserved in methanol during sampling. Three soil samples were collected for grain size analysis to determine the appropriate guideline selection. Samples were kept cool by including ice packs in sample coolers during shipment to the laboratory. A chain-of-custody form was completed and included in each sample cooler. The samples were submitted to Bureau Veritas (BV) laboratory in Winnipeg, Manitoba.

Underground utility clearances were not completed prior to the site visit, since only shallow samples (<0.30 m) were collected. Soil samples were collected with a shovel and trowel at sample depths of 0-0.15 m. A new pair of nitrile gloves was used to collect each soil sample as well as the trowel and shovel were cleaned after each sample was collected. Soil samples for volatiles including BTEX, PHC F1, and VOC analysis were collected using Terra CoreTM samplers, with the remaining soil collected for field-screening of headspace vapour concentrations. Field-screening for hydrocarbon vapours were conducted using a combustible gas detector (Eagle RKI) operated in methane elimination mode. Vapours were measured using a fixed-volume headspace technique: the soil was placed in a new sealable polyethylene bag, and after approximately ten minutes at temperatures above 10°C, the plastic bag was punctured and the headspace vapour level measured. The vapour levels were recorded in parts per million by volume (ppm) or in percentage of lower explosive limit (%LEL).

5.2 Quality Assurance and Quality Control

New pairs of nitrile gloves were used to collect each sample, and the sampling equipment was cleaned after each sample was collected. Soil samples were collected by dividing a portion of the sample into a laboratory-supplied container and the other portion in a heavy-duty polyethylene bag to be field-screened as described above. During the collection of field duplicates, a larger sample was taken and divided into two laboratory-supplied containers.

Quality control measures included the collection and analysis of blind duplicate samples, which are two samples collected simultaneously with no identification of the relevant duplicate pair. Field duplicates were labelled in the field in such a manner that the lab was blind to the original soil sample as a quality

assurance and quality control (QA/QC) measure. Immediately after collection, the samples, including field duplicates, were placed in a cooler on ice. The samples were delivered to BV Laboratories in Winnipeg, Manitoba, within the specified hold times. BV is an accredited laboratory under the Standards Council of Canada for the required analyses and applies a QA/QC program as part of its analytical process. BV implements an internal QA/QC program including laboratory duplicates, method blanks, and matrix spikes to ensure data quality and integrity.

Dillon-Outcome reviewed field duplicates. Relative percentage differences (RPD) were calculated between primary samples and corresponding blind field duplicate samples. Comparison of field duplicates for samples with results greater than five times the detection limits were considered acceptable if the RPD was less than the acceptable quality assurance limit for each parameter. RPDs were also considered acceptable if the absolute difference was less than the value of the detection limit.

Data collected in the field were transcribed to summary data tables, after which the data were confirmed against field notes. Analytical data was received from BV in electronic format and transferred electronically by Dillon-Outcome to a database (ESdat) for analysis in excel spreadsheets and confirmed against the laboratory reports.

The QA/QC procedures are intended to demonstrate that the samples collected and tested adequately represent conditions at the site.

6.0 Regulatory Guidelines

6.1 Contaminants of Potential Concern

The COPCs for the site are based on the current and historical coal piles (APEC 1), the drum and pail storage encountered on the site (APEC 2) and the presence of asbestos-containing building materials (APEC 3). Selected parameters included BTEX and PHC F1-F4, PAHs, VOCs, metals and bulk asbestos analysis.

6.2 Land Use and Soil Texture

The CCME CEQG outline guidelines for the environmental quality of a site based upon the land use at the subject site. Land use is assigned according to the following categories: Industrial, Commercial, Residential/Parkland, and Agricultural. Based on the historical land use as a residential property and the property being maintained as a heritage cultural resource the land is classified as residential/parkland.

The CCME guidelines for hydrocarbons in soil are dependent on soil texture. CCME defines a coarse-textured soil as having a median grain size of greater than 75 µm and fine textured soil as having a median grain size of less than 75 µm. Where both fine and coarse-textured soils are present on a site, the selected soil texture is the one that adequately describes the vertical and horizontal migration to the applicable receptors.

Particle size analysis was conducted on soil samples as part of this assessment. The particle size analysis described in greater detail in **Section 7.1.1** indicates that the tested soil consisted of both coarse and fine soil. As both grain sizes were encountered the coarse grain particle size was used for the determination of guidelines as a conservative approach.

6.3 Receptors

A brief overview of the potential receptors that may be applicable to the site and the rationale for selection or pathway elimination are discussed in Table 6-1 below.

Table 6-1: Exposure Pathway Summary Table

Exposure Pathway	Applicability	Rationale
Human Health Exposure Pathways		
Direct Contact	Yes	Areas of the site are accessible to the public, and therefore exposure to the public is a potential.
Vapour Inhalation	Yes	The site contains a tin and pole structure building, which is expected to remain for the foreseeable future.
Potable Groundwater	No	The site does not receive potable drinking water from on the site or within 500 m. In addition, a groundwater well search of the area indicates that an absence of domestic water wells within 500 m from the site.

Exposure Pathway	Applicability	Rationale
Ecological Health Exposure Pathways		
Ecological Soil Contact	Yes	The surface material at the site was mostly grass and muskeg or fill with limited surface cover, plants and terrestrial invertebrates present in soils are applicable.
Groundwater Check – Livestock & Irrigation	No	Livestock watering was not expected to occur within 500 m from the site. In addition, a groundwater well search of the area indicates an absence of livestock and irrigation water wells within 500 m of the site.
Groundwater Check – Aquatic Life	Yes	The area is low lying and quite marshy and several streams, small creeks and ponds are located surrounding the site. As such, the aquatic life pathway is applicable.
Off-Site Migration Check	Yes	Protective of more sensitive land uses.
Management Limits	Yes	Protective of more sensitive land uses.

The most stringent of the applicable guidelines presented above was used as the selected guidelines for the site and are presented in the appended soil analytical data tables.

The assessment criteria selected for comparison of analytical results at the site are referenced and described in more detail below.

6.3.1 Applicable Soil Quality Guidelines

Analytical results were compared to both the CCME, Canadian Soil Quality Guidelines and Canada Wide Standards for the protection of Environmental and Human Health, Residential/Parkland land use.

7.0 Phase II ESA Results

7.1 Soil

During the Phase I/II ESA, 30 soil samples (SS19-01, SS19-03 through SS19-13, SS19-15 through SS19-30, SS19-32 and SS19-33) and three field duplicates (SS19-02, SS19-14 and SS19-31) were collected to determine the presence/absence of soil impacts. The location of each soil samples is described in Table 2 (appended) and summarized below:

- SS19-01 through SS19-28 (including two field duplicates) to determine the potential impacts related to the historical coal piles (APEC 1);
- SS19-29 to determine the potential impacts related to the pail/drum dump area (APEC 2); and
- SS19-30 through SS19-33 (including one field duplicate) to assist in determining background conditions.

7.1.1 **Soil Analytical Results** – Grain Size Analysis

Soil samples were submitted for grain size analysis from three soil samples at the site. However, due to the high organic content (suspect coal dust) BV laboratories indicated that grain size analysis could not be completed on these samples. Grain size analysis was then completed on the background samples SS19-30, SS19-32, and SS19-33. Based on site observations during the sampling program the background samples consisted of sand to silty sand which was similar to the on-site soil samples. The grain size analysis indicated that one of the samples consisted of a coarse grain material and two of the samples consisted of fine grain material. Coarse grain material was selected for the purpose of the assessment as a conservative approach.

7.1.2 **Soil Analytical Results** – Background Samples

Three background soil samples, SS19-30, SS19-32, and SS19-33 were submitted for analysis of BTEX, PHC F1-F4, PAHs and metals. The background samples did not contain concentrations exceeding the assessment criteria as shown in Tables 3 to 6 (appended) and Figure 4 (appended), which indicate that the exceedances identified in soil are not reflective of background conditions.

7.1.3 **Soil Analytical Results** – Petroleum Hydrocarbons

Review of the analytical results indicate that the soil samples at APEC 1 and APEC 2 exceeded one or more parameters of benzene, toluene, PHC F1, and PHC F2. The following exceedance locations were encountered for the parameters:

Benzene (guideline of 0.095 mg/kg):

- A benzene exceedance of 0.18 mg/kg was encountered at SS19-18 (APEC 1).

Toluene (guideline of 0.1 mg/kg):

- Toluene exceedances were encountered at concentrations ranging from 0.1 to 1.2 mg/kg in APEC 1; and
- Several of the soil samples detection limits were raised to concentrations greater than the assessment criteria (SS19-21, SS19-23, SS19-26, and SS19-29); however, these potential exceedance locations also had additional PHC exceedances. Detection limits were raised for toluene due to low sample weight. The methanol sampling system requires a certain volume of sample to be placed in the methanol vials which is corrected for sample weight at the laboratory. As the samples at the site contained greater organics the sample was less dense that typical soil samples and the detection limits were adjusted accordingly.

PHC F1 (guideline of 40 mg/kg):

- A PHC F1 exceedance of 150 mg/kg was encountered at SS19-29 (APEC 2).

PHC F2 (guideline of 150 mg/kg):

- PHC F2 exceedances were encountered at 15 of the coal pile (APEC 1) locations ranging in concentrations from 150 mg/kg to 260 mg/kg.

PHC F3 (guideline of 300 mg/kg):

- PHC F3 exceedances were encountered at 19 of the coal pile (APEC 1) locations and the one pail dump area (APEC 2) ranging in concentrations from 370 to 670 mg/kg.

A summary of the soil analytical results for petroleum hydrocarbons are summarized in Table 3 (appended) and exceedance locations as applicable are presented in Figure 4 (attached). The laboratory certificate of analysis is attached in Appendix I.

7.1.4 **Soil Analytical Results** – VOCs

Review of the analytical results indicates that VOCs collected from the sample identified as SS19-29 (APEC 2) were below the applicable guidelines. However, due to modified laboratory detection limits the reported detection limits for trichloroethene (<0.079 mg/kg) is greater than the applicable guideline of 0.01 mg/kg. The detection limits were adjusted due to high moisture content and corresponding sample weight used for analysis. The methanol sampling system requires a certain volume of sample to be placed in the methanol vials which is corrected for sample weight at the laboratory. As the samples at the site contained greater organics the sample was less dense that typical soil samples and the detection limits were adjusted accordingly. It is noted that although this provides some uncertainty regarding VOC exceedances, PHC exceedances were encountered at this location.

A summary of the soil analytical results for VOCs are summarized in Table 4 (appended) and exceedance locations as applicable are presented in Figure 4 (attached). The laboratory certificate of analysis is attached in Appendix I.

7.1.5 Soil Analytical Results – Polycyclic Aromatic Hydrocarbons

Review of the analytical results indicate that soil samples collected at APEC 1 exceeded the recommended guidelines for one or more of Fluorene, Naphthalene and Phenanthrene.

Fluorene (guideline of 0.25 mg/kg):

- An exceedance was encountered in SS19-18 with a concentration of 0.3 mg/kg).

Naphthalene (guideline of 0.013 mg/kg):

- Exceedances were encountered at 27 of the sample locations ranging in concentrations of 0.013 mg/kg to 2.2 mg/kg.

Phenanthrene (guideline of 0.046 mg/kg):

- Exceedances were encountered at 24 of the sample locations ranging in concentrations of 0.051 mg/kg to 2.1 mg/kg.

A summary of the soil analytical results for PAHs are summarized in Table 5 (attached) and exceedance locations as applicable are presented in Figure 4 (attached). The laboratory certificate of analysis is attached in Appendix I.

7.1.6 Soil Analytical Results – Metals

Review of the analytical results indicate that metals were below the applicable guidelines in the analyzed parameters with the following exceptions of the Barium (guideline of 500 mg/kg) and Copper (guideline of 63 mg/kg) in the following two soil samples at APEC 1:

- SS19-24 with a concentration of 550 mg/kg for Barium (guideline of 500 mg/kg);
- SS19-27 with a concentration of 930 mg/kg for Copper (guideline of 63 mg.kg);
- Selenium's detection limit for the majority of the soil samples was raised to 1.3 mg/kg due to matrix interference, which exceeded the applicable guideline of 1.0 mg/kg, therefore it is unknown if selenium concentrations in the soil samples collected exceeded the applicable guideline of 1.0 mg/kg. However, after a review of the laboratory data and guidelines, these sampling locations (with the exception of SS19-04) have PAH and/or PHC concentrations exceeding the applicable guidelines. Therefore, the recommendations at these sampling locations are unaffected by the increased detection limits for selenium.

A summary of the soil analytical results for metals are summarized in Table 6 (appended) and exceedance locations as applicable are presented in Figure 4 (appended). The laboratory certificate of analysis is attached in Appendix I.

7.1.7 Soil Analytical Results – Exceedance Locations

7.1.7.1 Background Locations

As indicated in **Section 7.1.2** the background samples submitted did not have concentrations exceeding the referenced guidelines for BTEX, PHF F1-F4, PAHs, and metals.

APEC 1 – Coal Dust Piles:

During the site visit evidence of at least 40 coal pile remains were encountered. Samples were collected at a subset of these locations (26). Analytical concentrations indicated that soil exceedances for at least one parameter of BTEX, PHC F1-F4, PAHs, and metals were encountered in 25 of the 26 locations. One location (SS19-4) did not contain concentrations greater than the assessment criteria with the exception of the metal parameter selenium in which the detection limit was raised due to sample matrix interference.

APEC 2 – Pail Dump Area:

One soil sample (SS19-29) was submitted for laboratory analytical result of BTEX, PHC F1-F4, VOCs, and metals. Concentrations greater than the assessment guidelines were encountered for PHC F1 and PHC F2. The laboratory detection limits were greater than the assessment criteria for toluene and trichloroethene at this location.

7.2 Field QA/QC Results

Three field duplicates (SS19-02, SS19-14 and SS19-31) were submitted as part of the field QA/QC program. The RPD for the soil duplicate was within the acceptable quality assurance ranges (i.e., RPD less than 50% at concentrations greater than five times the detection limit), with the exception of two soil samples. The soil samples that exceeded the RPD are identified as SS19-01 and its field duplicate SS19-02 (RPD of 81% for copper) and SS19-13 and its field duplicate SS19-14 (RPD of 63% for naphthalene). A summary of the QA/QC RPD values are shown for soil in Table 7 (appended). Due to matrix interference the laboratory diluted the samples to avoid matrix interference. The laboratory dilution may be the rationale by the larger RPD values in these samples. Although greater than the acceptable RPD value the copper concentrations in both SS19-01 and its field duplicate SS19-02 remain lower than the applicable guideline and naphthalene concentrations in SS19-13 and SS19-14 remain several orders of magnitude greater than the applicable guideline. Therefore the finding of the results remains the same.

Based on field procedures, laboratory methods, sampling program design and field observations, Dillon concluded that the soil analytical results were acceptable for the purposes of this program.

7.3 Laboratory QA/QC Results

BV Labs conducted internal quality control tests using matrix spikes, spiked blanks, method blanks, quality control standards and lab duplicates. To assess the quality of the analytical data, a review of the

internal laboratory QA/QC results was completed and included a review of laboratory duplicate analysis, method blanks, surrogates, spike samples, and QA/QC standards. A review of BV Lab's Quality Control Report included in Appendix I indicated the following:

- The detection limits were adjusted in several samples due to the sample matrix interference for metal parameters. Results of the modified detection limits remained below the applicable guidelines with the exception of selenium in 27 of the sample locations.
- The detection limits were adjusted in several volatile samples due to high moisture content and sample weight used for analysis. The methanol sampling system requires a certain volume of sample to be placed in the methanol vials which is corrected for sample weight at the laboratory. As the samples at the site contained greater organics the sample was less dense that typical soil samples and the detection limits were adjusted accordingly.
- It was indicated that the results for several samples for Fluorene may be biased high as the qualifying ion was outside the acceptance range. However, the samples that the laboratory indicated might be biased high were below the referenced guidelines.

Based on the discussion above the analytical data were considered valid and reliable for the purpose of this report.

8.0 Summary and Recommendations

In October 2019, Dillon-Outcome conducted a Phase I/II ESA at the Former Sayisi Dene Village Site in Churchill, MB. The objective was to assess whether the site is or may be subject to actual or potential sources of contamination.

The subject site was previously developed in 1950 for residence buildings with 60 residential units. The Village was in existence until 1973 when occupants left and the buildings were either removed and transferred to Goose Creek or burned. The subject property currently has one metal building existing that is used as a sweat lodge and all building foundations and footings from the 60 residential units remain on the site in varying condition. The remains of the housing units consisted of concrete footings and foundations with several fiberglass tanks (or remnants of fiberglass tanks) thought to hold potable water. Miscellaneous debris such as glass, cans, wood, construction and metal debris were encountered throughout the site. The former residence buildings were heated via coal burning.

The following is a summary of the findings and potential sources of environmental concern identified during the Phase I/II ESA.

8.1 APEC 1 Coal Dust Piles

A coal dust material was observed in piles throughout the site. Based on discussions with interviewees, coal was used to heat the residential homes until 1973 when the occupants left. The coal material was historically placed in piles in front of the residential housing prior to use. During the site visit, evidence of at least 40 coal pile remains were encountered with samples collected for analysis of benzene, toluene, ethylbenzene, and xylenes (BTEX), PHC F1 to F4, PAHs, and metals at 26 of the locations. Analytical concentrations indicated that soil exceedances for at least one parameter of BTEX, PHC F1-F4, PAHs, and metals were encountered in 25 of the 26 locations. One location (SS19-4) did not contain concentrations greater than the assessment criteria with the exception of the metal parameter selenium in which the detection limit was raised due to sample matrix interference. However, based on the percentage of exceedances at the subset samples it should be assumed that the encountered 40 coal piles have concentrations greater than the assessment guidelines. The volume of the coal pile remnants and anticipated impacted soil was minimal (less than 0.5 m^3) with the exception of two coal piles that were mounded (CP11 and CP 39). Based on the observed coal pile dimensions it is estimated that there is approximately 50 m^3 of impacted material at the site resulting from the coal dust piles. It is recommended that the coal dust piles be removed from the site and properly be disposed of followed by environmental sampling to ensure remaining impacts have been removed prior to backfilling with clean fill, if required.

8.2 APEC 2 Pail Dump Area

During the site visit a pail dump area was encountered in the northeastern portion of the site. One soil sample (SS19-29) was collected for analysis of BTEX, PHC F1-F4, VOCs, and metals. Concentrations greater than the assessment guidelines were encountered for PHC F1 and PHC F2. The laboratory detection limits were greater than the assessment criteria for toluene and trichloroethene at this location. It is recommended that the pails, drums, and impacted soil (estimated at 20 m^3) encountered be removed from the site and properly be disposed of as well as environmental sampling to confirm remaining impacts have been removed prior to backfilling with clean fill, if required.

8.3 APEC 3 Asbestos-Containing Building Materials

During the site visit miscellaneous building material debris was encountered including suspect ACMs. Sixteen (16) samples of building materials were collected for analysis to determine the presence of asbestos. The laboratory analysis determined that eight (8) of the samples were ACMs (greater than 1.0% asbestos) and three (3) samples had trace asbestos. Since the Manitoba regulations indicate an ACM as any non-friable material that contains 1.0% or more asbestos, the asbestos present in the non-friable building material is considered a minor component of the material and thus, not considered a regulated asbestos-containing material. It is recommended that fragments of vinyl floor tiles and "Transite" cement board be removed from the site following Type 1 (Low Risk) asbestos abatement procedures. Type 1 (low risk) abatement procedures are a classification of asbestos-related work for removing non-friable asbestos containing materials from a building/structure without breaking, cutting, drilling, abrading, etc. the material. These non-destructive procedures provides a prescribed abatement method for an abatement contractor to safely remove non-friable asbestos-containing materials. Further information in regards to this type of asbestos-related work procedures can be found in the PSPC document Asbestos Management Standard (June 5, 2017, updated October 24, 2018)

8.4 Miscellaneous Debris

Miscellaneous debris was encountered throughout the site including broken glass, cans, metal, miscellaneous construction debris, ovens, bed frames, etc. Although not envisioned to be an environmental concern, for public safety and aesthetic reasons the miscellaneous debris is recommended to be removed from the site.

Based on the records review, interview with the site representative and visual observations at the time of the site visit, potential environmental concerns that may pose a risk to human and/or ecological health were identified as the Coal Dust Piles and the Pail Dump Area as described above.

9.0 Closure and Limitations

This report was prepared exclusively for the purposes, project and site location(s) outlined in the report. The report is based on information provided to, or obtained by Dillon-Outcome as indicated in the report, and applies solely to site conditions existing at the time of the site investigation(s). Although a reasonable investigation was conducted by Dillon-Outcome, Dillon-Outcome's investigation was by no means exhaustive and cannot be construed as a certification of the absence of any contaminants from the site(s). Rather, Dillon-Outcome's report represents a reasonable review of available information within an agreed work scope, schedule and budget. It is therefore possible that currently unrecognized contamination or potentially hazardous materials may exist at the site(s), and that the levels of contamination or hazardous materials may vary across the site(s). Further review and updating of the report may be required as local and site conditions, and the regulatory and planning frameworks, change over time.

Reasonable effort was made by Dillon-Outcome personnel to locate and sample accessible suspected asbestos-containing materials representative of the site. However, for any site the existence of unique or concealed materials or debris is a possibility. Historically, some underground utility piping has been known to contain asbestos (e.g. "Transite" pipe).

If any building materials suspected to contain asbestos become uncovered, or are discovered during future demolition or excavation activities, work should be stopped where suspected building material may be disturbed. Samples of the suspected building material should be submitted for analysis to assess for the presence of asbestos fibres. Until laboratory results confirm the presence/absence of asbestos, the building materials should be handled as potentially an ACM.

This report was prepared by Dillon-Outcome for the sole benefit of our Client, Public Services and Procurement Canada. The material in it reflects Dillon-Outcome's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Dillon-Outcome accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Sincerely,

DILLON CONSULTING LIMITED
AND OUTCOME CONSULTANTS IN JOINT VENTURE
(DILLON-OUTCOME)

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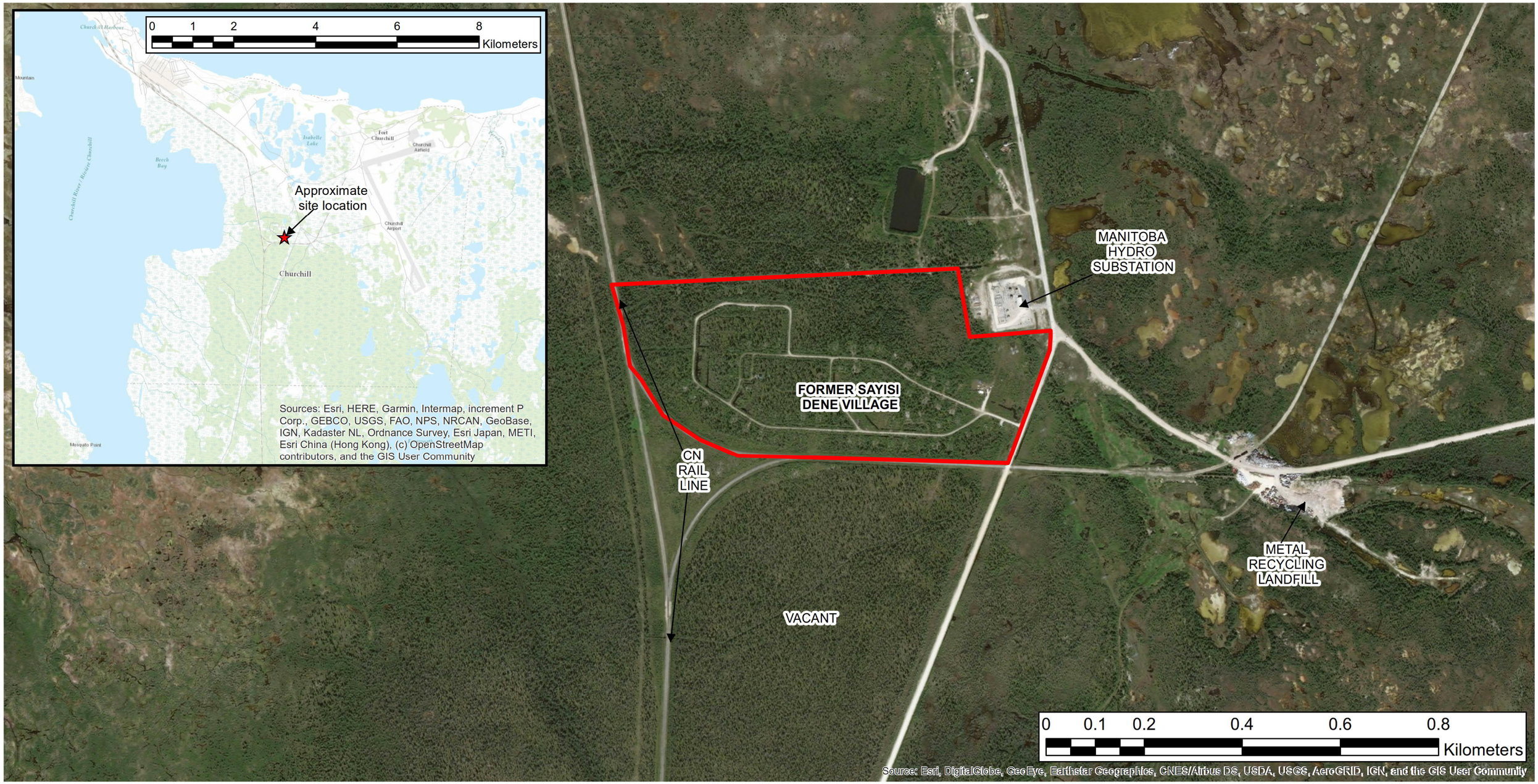
Project Manager

Ray Carter, P.Geo.
Senior Technical Reviewer

Figures



PHASE I/II ESA
Former Sayisi Dene Village
Churchill, Manitoba

FIGURE 1 - SITE LOCATION

Legend

Approximate_Site_Boundary

Approximate Site Location

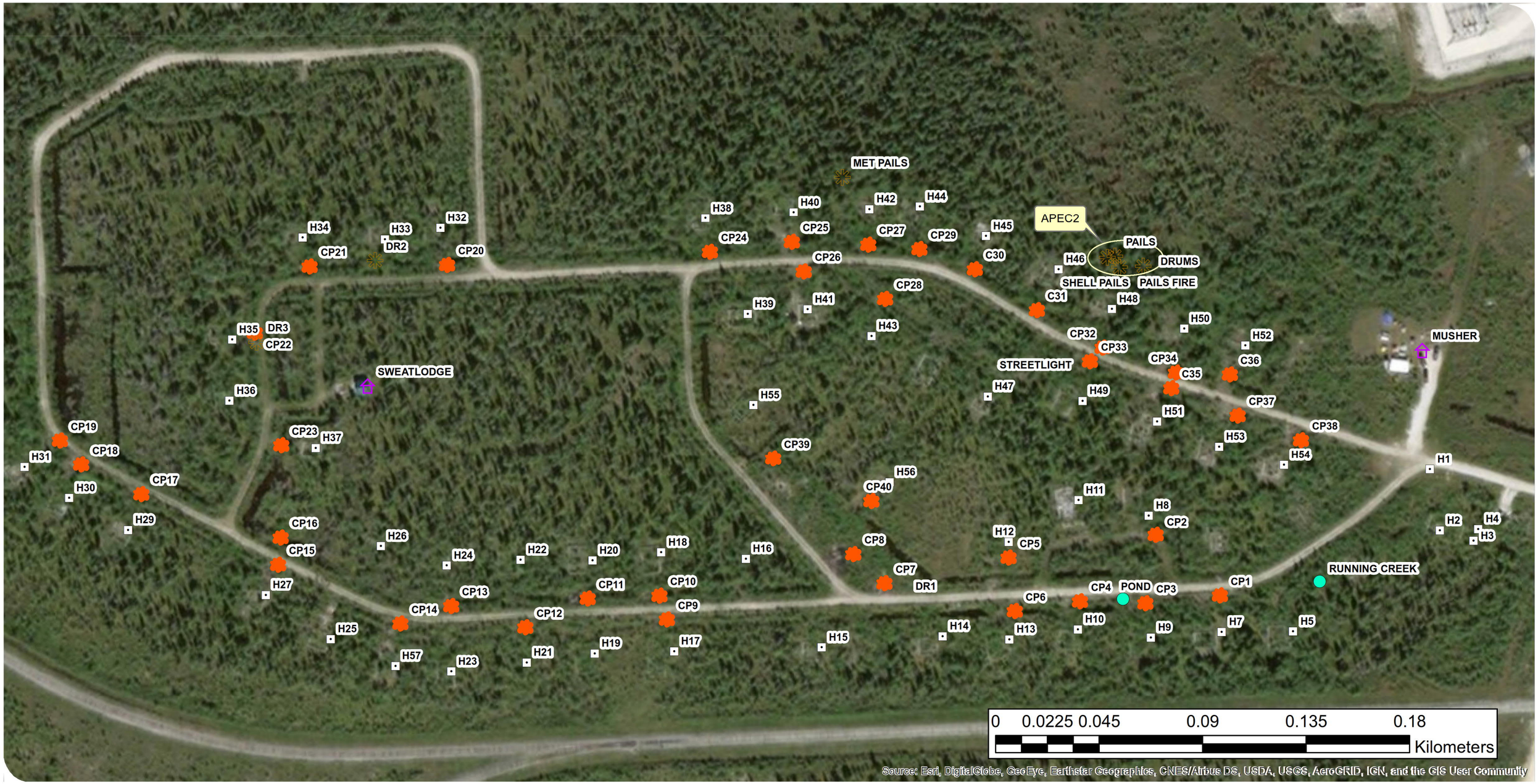
DILLON CONSULTING

MAP CREATED BY: AAM
MAP CHECKED BY: NLB
MAP PROJECTION: NAD 1983 UTM Zone 15N

N W E S

FILE LOCATION: G:\GIS\191615 - Churchill Phase I II ESA\Working

PROJECT: 19-1615 STATUS: FINAL DATE: December 2019



PHASE I/II ESA
Former Sayisi Dene Village
Churchill, Manitoba

FIGURE 2 - Site Features

Legend

- Building Foundation
- Coal Pile (APEC1)
- Current Building
- Debris
- Water Body

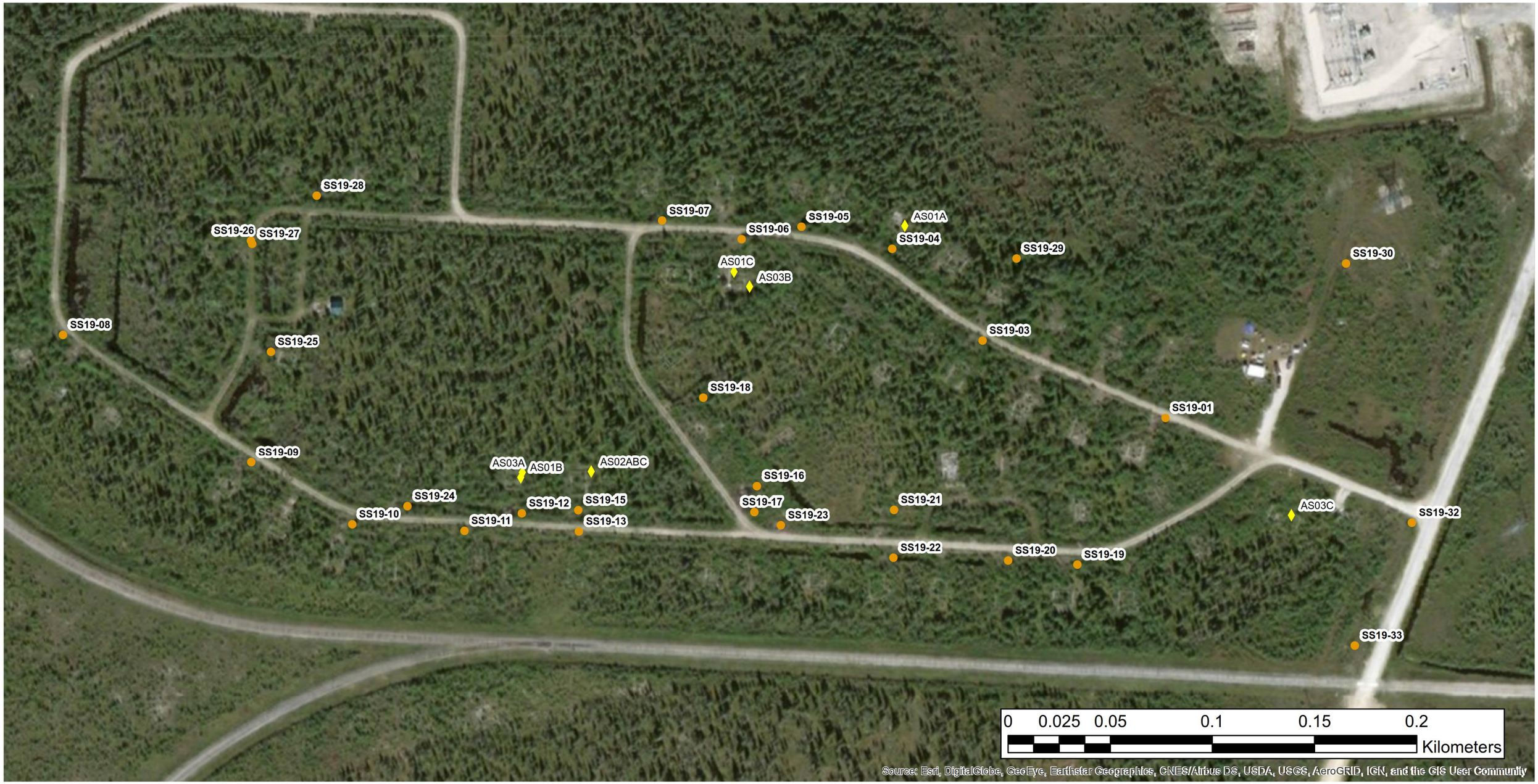
DILLON CONSULTING

MAP CREATED BY: AAM
MAP CHECKED BY: NLB
MAP PROJECTION: NAD 1983 UTM Zone 15N

N W E S

FILE LOCATION: G:\GIS\191615 - Churchill Phase I II ESA\Working

PROJECT: 19-1615 STATUS: FINAL DATE: December 2019



PHASE I/II ESA
Former Sayisi Dene Village
Churchill, Manitoba

FIGURE 3 - Sample Locations

Legend

- Asbestos Samples
- Soil Sampling Locations

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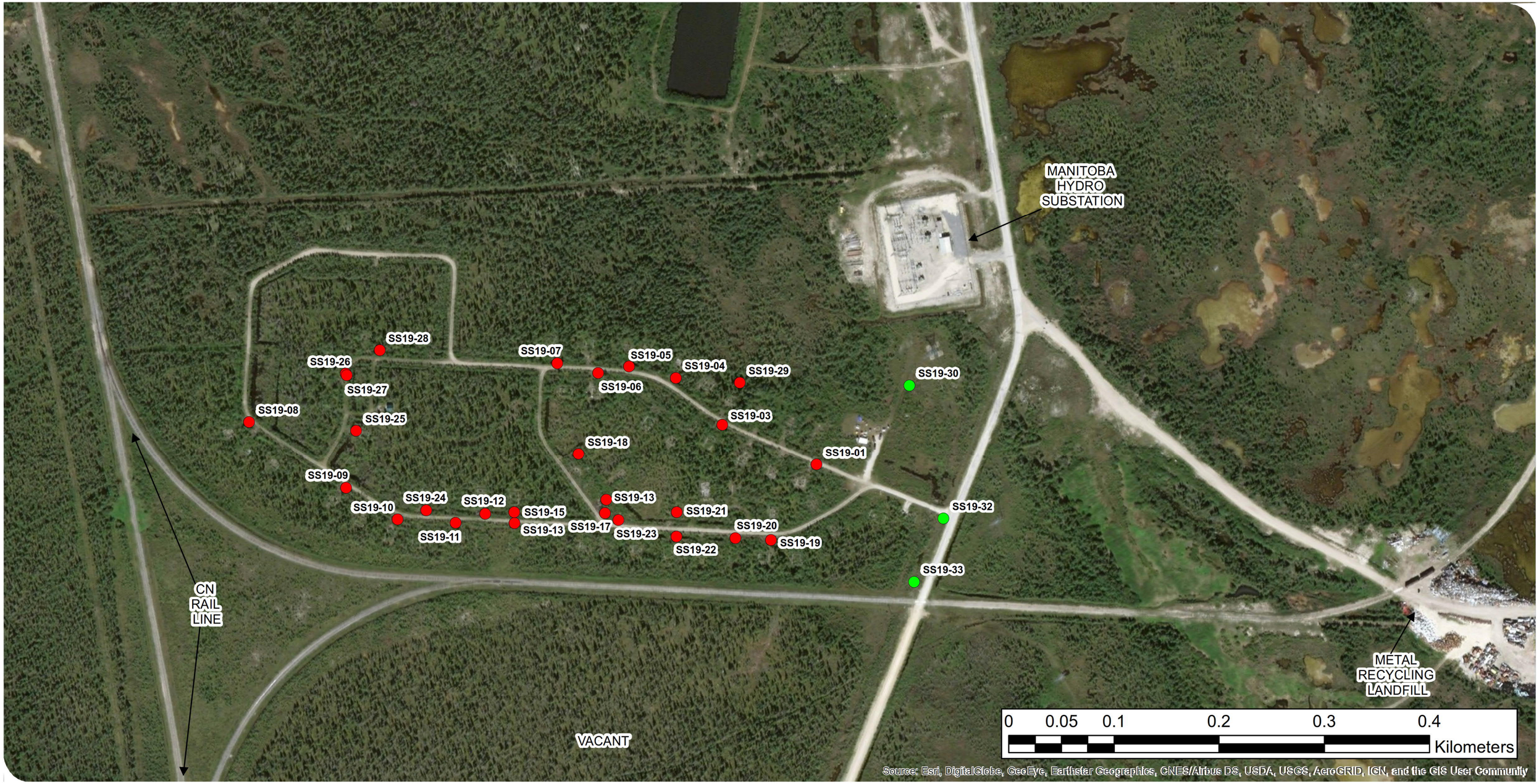
MAP CREATED BY: AAM
MAP CHECKED BY: NLB
MAP PROJECTION: NAD 1983 UTM Zone 15N

N W E S

FILE LOCATION: G:\GIS\191615 - Churchill Phase I II ESA\Working

PROJECT: 19-1615 STATUS: FINAL DATE: December 2019



PHASE I/II ESA
Former Sayisi Dene Village
Churchill, Manitoba

FIGURE 4 - SOIL EXCEEDANCE LOCATIONS

Legend

- Soil Samples Containing Exceedances
- Soil Samples Meeting Guidelines

DILLON CONSULTING

MAP CREATED BY: AAM
MAP CHECKED BY: NLB
MAP PROJECTION: NAD 1983 UTM Zone 15N

N W E S

FILE LOCATION: G:\GIS\191615 - Churchill Phase I II ESA\Working

PROJECT: 19-1615 STATUS: FINAL DATE: December 2019

Tables

Table 1 - Site Feature Locations

Code Identifier	Type	GPS Sampling Location		Description
		Latitude	Longitude	
H1	Building Foundation	58.7336300	-94.1122570	Near Plaque, concrete, no debris
H2	Building Foundation	58.7333910	-94.1122170	Fiberglass tank in building foundation
H3	Building Foundation	58.7333410	-94.1119710	Miscellaneous broken glass debris
H4	Building Foundation	58.7333850	-94.1119280	Miscellaneous metal debris
RUNNING CREEK	Water Body	58.7332280	-94.1131410	-
H5	Building Foundation	58.7330410	-94.1133690	-
H6	Building Foundation			Fill pile near roadway, fiberglass tank in building foundation
CP1	Coal Pile	58.7332010	-94.1138980	
H7	Building Foundation	58.7330590	-94.1139030	Miscellaneous debris - glass, shingles, metal
CP2	Coal Pile	58.7334550	-94.1143470	-
H8	Building Foundation	58.7335310	-94.1143890	-
CP3	Coal Pile	58.7331930	-94.1144620	-
H9	Building Foundation	58.7330580	-94.1144380	Miscellaneous debris - shingles and glass
POND	Water Body	58.7332160	-94.1146260	-
CP4	Coal Pile	58.7332180	-94.1149500	-
H10	Building Foundation	58.7331100	-94.1149790	Miscellaneous debris - shingles, glass, and cans
H11	Building Foundation	58.7336110	-94.1149040	Miscellaneous debris - fill, metal ducts, fibreglass tank, shingles, pink insulation, tar paper, bedframe, etc.
H12	Building Foundation	58.7334690	-94.1154490	-
CP5	Coal Pile	58.7334080	-94.1154600	-
CP6	Coal Pile	58.7331990	-94.1154440	-
H13	Building Foundation	58.7330910	-94.1154980	Miscellaneous debris - cans and burnt wood
DR1	Misc.	58.7333560	-94.1161860	Drum full of sand
H14	Building Foundation	58.7331220	-94.1159950	Miscellaneous debris - sink, cables, and steel
CP7	Coal Pile	58.7333440	-94.1164020	-
CP8	Coal Pile	58.7334660	-94.1166190	-
H15	Building Foundation	58.7331130	-94.1169050	Various metal
H16	Building Foundation	58.7334780	-94.1174250	-
CP9	Coal Pile	58.7332650	-94.1180490	-
H17	Building Foundation	58.7331400	-94.1180120	Fiberglass tank in building foundation
CP10	Coal Pile	58.7333600	-94.1180930	-
H18	Building Foundation	58.7335270	-94.1180550	Metal cans and glass
H19	Building Foundation	58.7331540	-94.1186080	-
H20	Building Foundation	58.7335150	-94.1185730	Glass, metal, fibreglass tank, and shingles
CP11	Coal Pile	58.7333690	-94.1186310	Coal Pile mounded, approximate dimensions 4.5 m x 3 m.
H21	Building Foundation	58.7331380	-94.1191210	-
CP12	Coal Pile	58.7332750	-94.1191120	-
H22	Building Foundation	58.7335380	-94.1191100	-
H23	Building Foundation	58.7331250	-94.1196900	-
CP13	Coal Pile	58.7333790	-94.1196560	-
H24	Building Foundation	58.7335370	-94.1196660	Single Battery
CP14	Coal Pile	58.7333250	-94.1200450	-
H25	Building Foundation	58.7332850	-94.1205750	Broken glass and cans
H26	Building Foundation	58.7336310	-94.1201500	Glass, cans, burn pile, insulation
CP15	Coal Pile	58.7335880	-94.1209300	-
H27	Building Foundation	58.7334740	-94.1210380	Glass, cans, miscellaneous metal
CP16	Coal Pile	58.7336930	-94.1208960	-
H28	Building Foundation	-	-	Could not access house due to flooded water, near CP16
CP17	Coal Pile	58.7339010	-94.1219140	-
H29	Building Foundation	58.7337650	-94.1220320	Metal, piles of broken glass, ceramic type waste material
CP18	Coal Pile	58.7340320	-94.1223480	-
H30	Building Foundation	58.7339060	-94.1224550	Fiberglass tank in building foundation, flooring pieces in back
CP19	Coal Pile	58.7341320	-94.1224950	-
H31	Building Foundation	58.7340380	-94.1227730	Glass, shingles, light fixtures, and cans
CP20	Coal Pile	58.7347040	-94.1195000	-
H32	Building Foundation	58.7348500	-94.1195290	Wood debris (broken door)
H33	Building Foundation	58.7348210	-94.1199530	Cans, metal, glass,
DR2	Debris	58.7347420	-94.1200390	Garbage drum full of glass cans and bottles
CP21	Coal Pile	58.7347370	-94.1205310	-
H34	Building Foundation	58.7348510	-94.1205670	-
CP22	Coal Pile	58.7344970	-94.1209790	-
H35	Building Foundation	58.7344760	-94.1211500	-
DR3	Debris	58.7344600	-94.1209680	Single Metal Container
H36	Building Foundation	58.7342390	-94.1212040	Flooring, concrete rubble, and insulation
SWEATLODGE	Current Building	58.7342580	-94.1201620	-
CP23	Coal Pile	58.7340510	-94.1208420	-
H37	Building Foundation	58.7340310	-94.1205850	Metal and glass debris
CP24	Coal Pile	58.7346800	-94.1175270	-
H38	Building Foundation	58.7348130	-94.1175410	Fiberglass tank, shingles, cans, glass, metal debris
H39	Building Foundation	58.7344290	-94.1172780	Fiberglass tank, glass, shingles, yellow insulation
CP25	Coal Pile	58.7346960	-94.1169100	-
H40	Building Foundation	58.7348110	-94.1168790	Fiberglass tank, metal debris (oven, heater, etc.)
CP26	Coal Pile	58.7345780	-94.1168360	-

Table 1 - Site Feature Locations

Code Identifier	Type	GPS Sampling Location		Description
		Latitude	Longitude	
H41	Building Foundation	58.7344300	-94.1168260	Extensive metal cans, floor tile, with tar/adhesive
CP27	Coal Pile	58.7346630	-94.1163400	-
MET PAILS	Debris	58.7349350	-94.1164960	-
H42	Building Foundation	58.7348020	-94.1163100	Burn piles, metal, and glass
CP28	Coal Pile	58.7344480	-94.1162420	-
H43	Building Foundation	58.7343080	-94.1163640	Some metal debris, glass, cans and bottles
CP29	Coal Pile	58.7346310	-94.1159590	-
H44	Building Foundation	58.7347980	-94.1159310	Fibreglass tank remains, shingles, paper, metal
C30	Coal Pile	58.7345370	-94.1155560	-
H45	Building Foundation	58.7346630	-94.1154530	Tile floor and wood subfloor present
C31	Coal Pile	58.7343620	-94.1151140	-
H46	Building Foundation	58.7345130	-94.1149280	Wood, metal, shingles, tar paper, flooring tiles
STREETLIGHT	Misc.	58.7341380	-94.1154440	
H47	Building Foundation	58.7340400	-94.1155270	Cans, Floor tiles, grounding rod
CP32	Coal Pile	58.7341970	-94.1146430	-
PAILS FIRE	Debris	58.7345060	-94.1144720	-
DRUMS	Debris	58.7345020	-94.1142950	-
PAILS	Debris	58.7345490	-94.1145000	-
SHELL PAILS	Debris	58.7345470	-94.1145570	-
H48	Building Foundation	58.7343450	-94.1145500	-
CP33	Coal Pile	58.7341480	-94.1147440	-
H49	Building Foundation	58.7339960	-94.1148210	Fibreglass tank, shingles, metal, and tiles
CP34	Coal Pile	58.7340800	-94.1141080	-
H50	Building Foundation	58.7342480	-94.1140210	Glass
C35	Coal Pile	58.7340210	-94.1141520	-
H51	Building Foundation	58.7338950	-94.1142740	Flooring, shingles, fiberglass tank
H52	Building Foundation	58.7341650	-94.1135700	Flooring, tiles, shingles, metal debris
C36	Coal Pile	58.7340570	-94.1137030	-
H53	Building Foundation	58.7337790	-94.1138220	Flooring, metal, shingles, glass
CP37	Coal Pile	58.7338950	-94.1136670	-
H54	Building Foundation	58.7336890	-94.1133460	Fibreglass tank, metal/glass cans, shingles, flooring
CP38	Coal Pile	58.7337810	-94.1132070	-
H55	Building Foundation	58.7340730	-94.1172840	Footing overgrown
CP39	Coal Pile	58.7338600	-94.1171670	Mound of coal approximate dimensions 1.5 m x 6 m
H56	Building Foundation	58.7337340	-94.1163080	Flooring, metal and glass
CP40	Coal Pile	58.7336670	-94.1164560	-
MUSHER	Current Building	58.7340970	-94.1122520	Dog Mushing Building
H57	Building Foundation	58.7331620	-94.1201070	-
METAL RECYCLE	Misc.	58.7331070	-94.1044610	Metal Recycling - offsite

Table 2 - Sample Locations

Sample #	Sample ID	APEC	GPS Sampling Location		HSVC (ppm)	Sample Analytical	Comments
			Latitude	Longitude			
1	SS19-01	APEC 1	-94.113192	58.733832	20	BTEX, PHC F1 - F4, PAH, Metals	
2	SS19-03	APEC 1	-94.11474802	58.73415898	40	BTEX, PHC F1 - F4, PAH, Metals	
3	SS19-04	APEC 1	-94.11552301	58.73455301	60	BTEX, PHC F1 - F4, PAH, Metals	
4	SS19-05	APEC 1	-94.11629104	58.73464303	25	BTEX, PHC F1 - F4, PAH, Metals	
5	SS19-06	APEC 1	-94.11679597	58.73458402	0	BTEX, PHC F1 - F4, PAH, Metals	
6	SS19-07	APEC 1	-94.11746903	58.73466097	5	BTEX, PHC F1 - F4, PAH, Metals	
7	SS19-08	APEC 1	-94.12251502	58.73411497	10	BTEX, PHC F1 - F4, PAH, Metals	
8	SS19-09	APEC 1	-94.12090704	58.73356897	20	BTEX, PHC F1 - F4, PAH, Metals	
9	SS19-10	APEC 1	-94.12004697	58.73330603	-	BTEX, PHC F1 - F4, PAH, Metals	
10	SS19-11	APEC 1	-94.11909403	58.73328499	-	BTEX, PHC F1 - F4, PAH, Metals	
11	SS19-12	APEC 1	-94.11861199	58.73336697	-	BTEX, PHC F1 - F4, PAH, Metals	
12	SS19-13	APEC 1	-94.11812902	58.73329103	55	BTEX, PHC F1 - F4, PAH, Metals	
13	SS19-15	APEC 1	-94.11813699	58.73338399	25	BTEX, PHC F1 - F4, PAH, Metals	
14	SS19-16	APEC 1	-94.11663101	58.73350301	75	BTEX, PHC F1 - F4, PAH, Metals	
15	SS19-17	APEC 1	-94.11664903	58.73338901	80	BTEX, PHC F1 - F4, PAH, Metals	
16	SS19-18	APEC 1	-94.11709604	58.73388799	30	BTEX, PHC F1 - F4, PAH, Metals	
17	SS19-19	APEC 1	-94.11391603	58.73318299	10	BTEX, PHC F1 - F4, PAH, Metals	
18	SS19-20	APEC 1	-94.11449899	58.73319598	40	BTEX, PHC F1 - F4, PAH, Metals	
19	SS19-21	APEC 1	-94.11547104	58.73340804	60	BTEX, PHC F1 - F4, PAH, Metals	
20	SS19-22	APEC 1	-94.11546802	58.733199	25	BTEX, PHC F1 - F4, PAH, Metals	
21	SS19-23	APEC 1	-94.11642398	58.73333403	0	BTEX, PHC F1 - F4, PAH, Metals	
22	SS19-24	APEC 1	-94.11958002	58.73338901	50	BTEX, PHC F1 - F4, PAH, Metals	
23	SS19-25	APEC 1	-94.12075801	58.73405697	25	BTEX, PHC F1 - F4, PAH, Metals	
24	SS19-26	APEC 1	-94.12094199	58.73454102	25	BTEX, PHC F1 - F4, PAH, Metals	
25	SS19-27	APEC 1	-94.120929	58.73452803	25	BTEX, PHC F1 - F4, PAH, Metals	
26	SS19-28	APEC 1	-94.12039298	58.73474596	15	BTEX, PHC F1 - F4, PAH, Metals	
27	SS19-29	APEC 2	-94.114472	58.73451998	25	BTEX, PHC F1 - F4, Metals, VOCs	Pail Dump Area
28	SS19-30	Background	-94.11168703	58.734522	0	BTEX, PHC F1 - F4, PAH, Metals, Grain Size Analysis	Background; sand
29	SS19-32	Background	-94.111093	58.73339103	0	BTEX, PHC F1 - F4, PAH, Metals, Grain Size Analysis	Background; sand/silt
30	SS19-33	Background	-94.11155803	58.73284897	0	BTEX, PHC F1 - F4, PAH, Metals, Grain Size Analysis	Background; sand/silt
-	AS02ABC	APEC 3	-94.1180310	58.7335540	NA	Asbestos	Asbestos Sampling - Transite
-	AS03A	APEC 3	-94.1186120	58.7335440	NA	Asbestos	Asbestos Sampling - Shingles
-	AS01B	APEC 3	-94.1186260	58.7335240	NA	Asbestos	Asbestos Sampling - Flooring
-	AS01C	APEC 3	-94.1168550	58.7344430	NA	Asbestos	Asbestos Sampling - Flooring
-	AS03B	APEC 3	-94.1167210	58.7343780	NA	Asbestos	Asbestos Sampling - Shingles
-	AS03C	APEC 3	-94.1121110	58.7334150	NA	Asbestos	Asbestos Sampling - Shingles
-	AS01A	APEC 3	-94.1154190	58.7346550	NA	Asbestos	Asbestos Sampling - Flooring

Comments

BTEX Benzene, Toluene, Ethylbenzene, Xylenes
PHC Petroleum Hydrocarbon
PAH Polycyclic Aromatic Hydrocarbons
VOC Volatile Organic Compounds
HSVC head space vapour concentrations
ppm parts per million
NA Not Applicable
APEC Area of Potential Environmental Concern (see report for reference)

Table 3 - Soil Analytical Results - PHCs

Location	Sample ID	Sample Depth (m)	Sample Date	APEC	HSVC (ppm)	Matrix	Sieve (>0.075mm)	Benzene	Toluene	Ethylbenzene	Xylenes Total	PHC F1 (C6-C10) - BTEX	PHC F2 (C10-C16)	PHC F3 (C16-C34)	PHC F4 (C34-C50)
							-	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
						EQL	-	0.005	0.05	0.01	0.045	10	10	50	50
SS19-01	SS19-01	0 - 0.15	02/10/2019	APEC 1	20	Soil	-	<0.012	<0.08	0.16	0.48	<24	97	230	<50
SS19-01	SS19-02	0 - 0.15	02/10/2019	APEC 1	-	Soil	-	<0.012	<0.08	0.18	0.49	<23	94	220	<50
SS19-03	SS19-03	0 - 0.15	02/10/2019	APEC 1	40	Soil	-	0.078	0.14	0.15	0.42	<21	190	570	110
SS19-04	SS19-04	0 - 0.15	02/10/2019	APEC 1	60	Soil	-	<0.005	<0.05	0.056	0.14	<10	43	140	<50
SS19-05	SS19-05	0 - 0.15	02/10/2019	APEC 1	25	Soil	-	<0.012	<0.08	0.33	0.77	<24	170	640	130
SS19-06	SS19-06	0 - 0.15	02/10/2019	APEC 1	0	Soil	-	<0.012	<0.08	0.15	0.39	<24	110	400	69
SS19-07	SS19-07	0 - 0.15	02/10/2019	APEC 1	5	Soil	-	0.018	<0.08	0.25	0.64	<21	150	450	72
SS19-08	SS19-08	0 - 0.15	02/10/2019	APEC 1	10	Soil	-	<0.011	<0.08	0.091	0.24	<21	74	220	<50
SS19-09	SS19-09	0 - 0.15	02/10/2019	APEC 1	20	Soil	-	<0.011	<0.08	0.35	0.95	<23	160	470	84
SS19-10	SS19-10	0 - 0.15	02/10/2019	APEC 1	-	Soil	-	0.025	<0.09	0.44	0.99	<24	150	420	66
SS19-11	SS19-11	0 - 0.15	02/10/2019	APEC 1	-	Soil	-	<0.01	0.1	0.099	0.28	<20	57	180	<50
SS19-12	SS19-12	0 - 0.15	02/10/2019	APEC 1	-	Soil	-	0.019	0.093	0.47	1	17	140	510	93
SS19-13	SS19-13	0 - 0.15	03/10/2019	APEC 1	55	Soil	-	0.014	<0.1	0.42	1.1	<24	130	370	63
SS19-13	SS19-14	0 - 0.15	03/10/2019	APEC 1	-	Soil	-	<0.014	<0.1	0.48	1.2	<29	170	430	72
SS19-15	SS19-15	0 - 0.15	03/10/2019	APEC 1	25	Soil	-	<0.012	<0.08	0.16	0.41	<23	97	250	<50
SS19-16	SS19-16	0 - 0.15	03/10/2019	APEC 1	75	Soil	-	<0.011	<0.08	0.22	0.48	<22	99	220	<50
SS19-17	SS19-17	0 - 0.15	03/10/2019	APEC 1	80	Soil	-	<0.012	<0.1	0.43	0.93	<24	160	400	67
SS19-18	SS19-18	0 - 0.15	03/10/2019	APEC 1	30	Soil	-	0.18	1.2	0.25	3.5	34	140	410	130
SS19-19	SS19-19	0 - 0.15	03/10/2019	APEC 1	10	Soil	-	<0.014	<0.1	0.23	0.56	<24	180	470	86
SS19-20	SS19-20	0 - 0.15	03/10/2019	APEC 1	40	Soil	-	<0.014	<0.1	0.55	1.2	<24	180	530	82
SS19-21	SS19-21	0 - 0.15	03/10/2019	APEC 1	60	Soil	-	<0.011	<0.11	0.58	1.1	<22	180	480	80
SS19-22	SS19-22	0 - 0.15	03/10/2019	APEC 1	25	Soil	-	<0.013	<0.08	0.32	0.83	<24	240	600	88
SS19-23	SS19-23	0 - 0.15	03/10/2019	APEC 1	0	Soil	-	0.014	<0.11	0.41	0.89	<24	220	460	83
SS19-24	SS19-24	0 - 0.15	03/10/2019	APEC 1	50	Soil	-	0.013	<0.08	0.5	1.2	<24	260	670	120
SS19-25	SS19-25	0 - 0.15	03/10/2019	APEC 1	25	Soil	-	<0.014	<0.08	0.054	<0.13	<24	92	250	51
SS19-26	SS19-26	0 - 0.15	03/10/2019	APEC 1	25	Soil	-	<0.011	<0.11	0.4	0.89	<22	190	510	95
SS19-27	SS19-27	0 - 0.15	03/10/2019	APEC 1	25	Soil	-	0.021	<0.08	0.45	1	<24	150	460	110
SS19-28	SS19-28	0 - 0.15	03/10/2019	APEC 1	15	Soil	-	<0.005	<0.05	0.065	0.15	<10	50	140	<50
SS19-29	SS19-29	0 - 0.15	03/10/2019	APEC 2	25	Soil	-	<0.04	<0.12	0.096	<0.35	150	<25	650	190
SS19-30	SS19-30	0 - 0.15	03/10/2019	Background	0	Soil	83% (coarse)	<0.005	<0.05	<0.01	<0.045	<10	<10	<50	<50
SS19-30	SS19-31	0 - 0.15	03/10/2019	Background	-	Soil	-	<0.01	<0.08	<0.021	<0.092	<21	<21	<100	<100
SS19-32	SS19-32	0 - 0.15	03/10/2019	Background	0	Soil	42% (fine)	<0.005	<0.05	<0.01	<0.045	<10	<10	<50	<50
SS19-33	SS19-33	0 - 0.15	03/10/2019	Background	0	Soil	33% (fine)	<0.005	<0.05	<0.01	<0.045	<10	<10	<50	<50
Guidelines							NG	0.095 [1]	0.1 [2]	50 [2]	14 [1]	30 [3]	150 [4]	300 [4]	2800 [4]

Comments

[1] Canadian Soil Quality Guideline Residential/Parkland Land Use, Surface Soil, Coarse Grained, Inhalation of indoor air check (slab on grade) (CCME 2008)

[2] Canadian Soil Quality Guideline Residential/Parkland Land Use, Surface Soil, Coarse Grained, Groundwater check (aquatic life) (CCME 2008)

[3] Canada Wide Standards for Petroleum Hydrocarbons - Residential Land Use, Coarse Grained, Surface Soil, Vapour Inhalation (indoor, slab on grade) (CCME 2008)

[4] Canada Wide Standards for Petroleum Hydrocarbons - Residential, Coarse, Surface, Eco Soil Contact (CCME 2008)

PHC Petroleum Hydrocarbon
mg/kg Milligrams per Kilogram
NG No Guideline
APEC Area of Potential Environmental Concern
HSVC Head Space Vapour Concentrations
"-" Sample Not Analyzed
< Less than laboratory detection limits
BOLD Exceeds the referenced assessment criteria
Detection limit is greater than referenced assessment criteria

Table 4 - Soil Analytical Results - VOCs

Location	Sample ID	Sample Depth (m)	Sample Date	APEC	HSVC (ppm)	Matrix Type	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-trimethylbenzene	1,2-dibromoethane (Ethylene dibromide)	1,2-dichloroethane	1,2-dichloropropane	1,3,5-Trichlorobenzene	1,3,5-trimethylbenzene	Bromodichloromethane	Bromoform	Bromomethane	Carbon tetrachloride	Chlorobenzene	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
						EQL	0.4	0.16	0.4	0.16	0.16	0.16	0.32	4	0.016	0.016	0.16	0.32	4	0.24	0.4	0.16	0.004	0.0079	0.16	0.16	0.079	0.24
SS19-29	SS19-29	0 - 0.15	03/10/2019	APEC 2	25	Soil	<0.4	<0.16	<0.4	<0.16	<0.16	<0.16	<0.32	<4	<0.016	<0.016	<0.16	<0.32	<4	<0.24	<0.4	<0.16	<0.004	<0.0079	<0.16	<0.16	<0.079	<0.24
Guidelines							NG	5	5	5	5	5	2	NG	NG	5	5	2	NG	NG	NG	NG	5	1	NG	NG	5	NG

Comments

mg/kg	Milligrams per Kilogram
NG	No Guideline
APEC	Area of Potential Environmental Concern
HSVC	Head Space Vapour Concentrations
<	Less than laboratory detection limits
BOLD	Exceeds the referenced assessment criteria
	Detection limit is greater than referenced assessment criteria

Table 4 - Soil Analytical Results - VOCs

Location	Sample ID	Sample Depth (m)	Sample Date	APEC	HSVC (ppm)	Matrix Type	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Dichloromethane	Methyl Methacrylate	Methyl tert-Butyl Ether (MTBE)	Styrene	Trichloroethene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichlorofluoromethane	Vinyl chloride	1,2,4-trichlorobenzene	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
						EQL	0.16	0.16	0.24	0.32	0.24	0.16	0.079	0.079	0.16	0.16	0.16	0.0024	0.32	0.16	0.16	0.16
SS19-29	SS19-29	0 - 0.15	03/10/2019	APEC 2	25	Soil	<0.16	<0.16	<0.24	<0.32	<0.24	<0.16	<0.079	<0.079	<0.16	<0.16	<0.16	<0.0024	<0.32	<0.16	<0.16	<0.16
Guidelines							NG	NG	5	NG	NG	5	0.01	0.2	NG	NG	NG	NG	2	1	1	1

Comments

mg/kg Milligrams per Kilogram
NG No Guideline
APEC Area of Potential Environmental Concern
HSVC Head Space Vapour Concentrations
< Less than laboratory detection limits
BOLD Exceeds the referenced assessment criteria
Detection limit is greater than referenced assessment criteria

Table 5 - Soil Analtyical Results - PAHs

Location	Sample ID	Sample Depth (m)	APEC	Sample Date	Matrix	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Acridine	Anthracene	Benzo(a)anthracene	Benzo(a) pyrene	Benzo(b+j)fluoranthene	Benzo(c)phenanthrene	Benzo(e)pyrene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Perylene	Phenanthrene	Pyrene	Quinoline	Light Molecular Weight (PAH Sum)	Heavy Molecular Weight (PAH Sum)	PAHs (Sum of total)	B(a)P Total Potency Equivalent
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
					EQL	0.005	0.005	0.005	0.01	0.004	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	0.01	0.01	0.005	0.01	0.0071
SS19-01	SS19-01	0 - 0.15	APEC 1	02/10/2019	Soil	0.12	<0.005	0.009	0.015	<0.004	0.0089	<0.005	0.0086	<0.005	<0.005	<0.005	<0.005	0.009	<0.005	0.049	<0.005	<0.005	0.042	0.011	0.057	0.056	<0.01	0.24	0.13	0.37	<0.0071
SS19-01	SS19-02	0 - 0.15	APEC 1	02/10/2019	Soil	0.12	<0.005	0.0082	0.016	<0.004	0.01	<0.005	0.012	<0.005	0.0075	<0.005	<0.005	0.012	<0.005	0.054	<0.005	<0.005	0.04	0.017	0.065	0.058	<0.01	0.25	0.15	0.39	0.008
SS19-03	SS19-03	0 - 0.15	APEC 1	02/10/2019	Soil	0.21	<0.005	0.016	0.028	0.008	0.02	<0.005	0.023	<0.005	0.012	<0.005	<0.005	0.025	<0.005	0.12	0.011	<0.005	0.083	0.026	0.13	0.14	<0.01	0.49	0.32	0.82	0.01
SS19-04	SS19-04	0 - 0.15	APEC 1	02/10/2019	Soil	0.029	<0.005	<0.005	<0.01	<0.004	<0.005	<0.005	0.0074	<0.005	<0.005	<0.005	<0.005	0.0074	<0.005	0.031	<0.005	<0.005	0.0063	0.012	0.029	0.034	<0.01	0.064	0.08	0.14	<0.0071
SS19-05	SS19-05	0 - 0.15	APEC 1	02/10/2019	Soil	0.15	<0.005	0.013	0.024	0.0073	0.025	<0.005	0.021	<0.005	0.013	<0.005	<0.005	0.025	<0.005	0.12	0.0087	<0.005	0.047	0.022	0.13	0.15	<0.01	0.38	0.34	0.73	0.01
SS19-06	SS19-06	0 - 0.15	APEC 1	02/10/2019	Soil	0.096	<0.005	0.0088	0.017	<0.004	0.023	0.01	0.03	<0.005	0.021	0.01	<0.005	0.022	<0.005	0.074	<0.005	0.011	0.026	0.021	0.071	0.098	<0.01	0.22	0.28	0.5	0.02
SS19-07	SS19-07	0 - 0.15	APEC 1	02/10/2019	Soil	0.19	<0.005	0.013	0.02	0.0081	0.025	0.0086	0.026	<0.005	0.018	0.0075	<0.005	0.027	<0.005	0.096	0.01	0.0083	0.077	0.02	0.11	0.13	<0.01	0.42	0.32	0.75	0.018
SS19-08	SS19-08	0 - 0.15	APEC 1	02/10/2019	Soil	0.06	<0.005	<0.005	0.018	<0.004	0.0093	<0.005	0.0085	<0.005	<0.005	<0.005	<0.005	0.0096	<0.005	0.04	<0.005	<0.005	0.018	0.012	0.042	0.056	<0.01	0.14	0.12	0.26	<0.0071
SS19-09	SS19-09	0 - 0.15	APEC 1	02/10/2019	Soil	0.19	<0.005	0.013	0.024	<0.004	0.011	<0.005	0.0073	<0.005	<0.005	<0.005	<0.005	0.014	<0.005	0.059	0.01	<0.005	0.069	0.023	0.079	0.096	<0.01	0.39	0.19	0.58	0.008
SS19-10	SS19-10	0 - 0.15	APEC 1	02/10/2019	Soil	0.22	<0.005	0.014	0.018	0.0057	0.014	<0.005	0.01	<0.005	<0.005	<0.005	<0.005	0.015	<0.005	0.069	0.0084	<0.005	0.095	0.014	0.086	0.095	<0.01	0.45	0.2	0.65	0.008
SS19-11	SS19-11	0 - 0.15	APEC 1	02/10/2019	Soil	0.044	<0.005	<0.005	<0.01	<0.004	0.0081	<0.005	0.01	<0.005	<0.005	<0.005	<0.005	0.009	<0.005	0.031	<0.005	<0.005	0.013	0.01	0.031	0.034	<0.01	0.088	0.092	0.18	<0.0071
SS19-12	SS19-12	0 - 0.15	APEC 1	02/10/2019	Soil	0.17	<0.005	0.012	0.018	0.0081	0.039	0.013	0.031	0.0077	0.021	0.0085	<0.005	0.033	<0.005	0.13	0.0085	0.0071	0.061	0.027	0.14	0.15	<0.01	0.41	0.41	0.82	0.024
SS19-13	SS19-13	0 - 0.15	APEC 1	03/10/2019	Soil	0.15	<0.005	0.013	0.015	<0.004	0.018	<0.005	0.015	<0.005	0.0082	<0.005	<0.005	0.021	<0.005	0.091	0.0075	<0.005	0.051	0.013	0.093	0.13	<0.01	0.33	0.27	0.6	0.009
	SS19-14	0 - 0.15	APEC 1	03/10/2019	Soil	0.23	<0.005	0.015	0.019	<0.004	0.014	<0.005	0.014	<0.005	0.0078	<0.005	<0.005	0.021	<0.005	0.083	0.009	<0.005	0.098	0.014	0.12	0.099	<0.01	0.49	0.23	0.72	0.009
SS19-15	SS19-15	0 - 0.15	APEC 1	03/10/2019	Soil	0.12	<0.005	0.0092	0.016	<0.004	0.012	<0.005	0.024	<0.005	0.013	<0.005	<0.005	0.02	<0.005	0.068	<0.005	0.009	0.041	0.013	0.065	0.08	<0.01	0.25	0.21	0.47	0.01
SS19-16	SS19-16	0 - 0.15	APEC 1	03/10/2019	Soil	0.26	<0.005	0.011	0.017	<0.004	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0085	<0.005	0.04	<0.005	<0.005	0.084	0.013	0.063	0.052	<0.01	0.43	0.1	0.53	<0.0071
SS19-17	SS19-17	0 - 0.15	APEC 1	03/10/2019	Soil	0.29	<0.005	0.011	0.025	<0.004	0.0073	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0087	<0.005	0.046	0.0087	<0.005	0.11	0.011	0.082	0.068	0.2	0.73	0.13	0.86	<0.0071
SS19-18	SS19-18	0 - 0.15	APEC 1	03/10/2019	Soil	10	0.24	0.027	0.38	0.029	0.12	0.063	0.16	0.013	0.16	0.059	0.016	0.22	0.039	0.088	0.3	0.022	2.2	<0.005	2.1	0.18	0.083	15	0.98	16	0.14
SS19-19	SS19-19	0 - 0.15	APEC 1	03/10/2019	Soil	0.37	0.0087	0.016	0.021	0.0067	0.013	<0.005	0.013	<0.005	<0.005	<0.005	<0.005	0.025	<0.005	0.075	0.0093	<0.005	0.12	0.0096	0.13	0.086	<0.01	0.69	0.21	0.9	0.008
SS19-20	SS19-20	0 - 0.15	APEC 1	03/10/2019	Soil	0.25	<0.005	0.018	0.022	0.0074	0.02	0.0084	0.037	<0.005	0.021	0.01	0.0088	0.03	<0.005	0.12	0.0093	0.011	0.11	0.012	0.12	0.13	<0.01	0.54	0.37	0.91	0.019
SS19-21	SS19-21	0 - 0.15	APEC 1	03/10/2019	Soil	1	0.015	0.029	0.025	<0.004	0.0093	<0.005	<0.005	0.0086	<0.005	<0.005	<0.005	0.028	<0.005	0.081	0.019	<0.005	0.17	0.01	0.2	0.12	<0.01	1.5	0.25	1.7	<0.0071
SS19-22	SS19-22	0 - 0.15	APEC 1	03/10/2019	Soil	0.33	<0.005	0.032	0.039	<0.004	0.012	<0.005	0.0076	0.012	<0.005	0.0089	<0.005	0.022	<0.005	0.1	0.015	<0.005	0.16	0.011	0.14	0.13	<0.01	0.71	0.29	1	0.008
SS19-23	SS19-23	0 - 0.15	APEC 1	03/10/2019	Soil	0.36	0.0093	0.031	0.026	<0.004	0.0075	<0.005	<0.005	0.0078	<0.005	<0.005	<0.005	0.015	<0.005	0.068	0.014	<0.005	0.18	0.012	0.1	0.12	<0.01	0.72	0.22	0.94	<0.0071
SS19-24	SS19-24	0 - 0.15	APEC 1	03/10/2019	Soil	0.32	0.0087	0.036	0.028	<0.004	0.015	<0.005	0.0084	0.012	<0.005	<0.005	<0.005	0.026	<0.005	0.095	0.015	<0.005	0.15	0.016	0.12	0.17	<0.01	0.68	0.32	1	0.008
SS19-25	SS19-25	0 - 0.15	APEC 1	03/10/2019	Soil	0.076	<0.005	0.011	0.017	<0.004	<0.005	<0.005	<0.005	<0.005	0.01	<0.005	<0.005	0.014	<0.005	0.039	<0.005	<0.005	0.025	0.0083	0.051	0.052	<0.01	0.18	0.11	0.29	<0.0071
SS19-26	SS19-26	0 - 0.15	APEC 1	03/10/2019	Soil	0.28	<0.005	0.026	0.025	0.011	0.026	0.015	0.023	0.014	0.018	0.01	<0.005	0.038	<0.005	0.1	0.012	<0.005	0.14	0.021	0.14	0.14	<0.01	0.64	0.37	1	0.023
SS19-27	SS19-27	0 - 0.15	APEC 1	03/10/2019	Soil	0.17	<0.005	0.018	0.019	0.0061	0.022	0.012	0.017	0.011	0.017	<0.005	<0.005	0.03	<0.005	0.078	0.0093	<0.005	0.079	0.017	0.094	0.12	<0.01	0.39	0.29	0.68	0.019
SS19-28	SS19-28	0 - 0.15	APEC 1	03/10/2019	Soil	0.047	<0.005	0.0079	<0.01	<0.004	0.01	0.0071	0.011	<0.005	<0.005	<0.005	<0.005	0.015	<0.005	0.04	<0.005	<0.005	0.017	0.0075	0.04	0.047	<0.01	0.11	0.13	0.24	0.012
SS19-30	SS19-30	0 - 0.15	Background	03/10/2019	Soil	<0.005	<0.005	<0.005	<0.01	<0.004	<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	<0.01	<0.01	<0.005	<0.01	<0.0071
	SS19-31	0 - 0.15	Background	03/10/2019	Soil	<0.0095	<0.0095	<0.0095	<0.019	<0.0076	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.019	<0.019	<0.0095	<0.019	<0.014
SS19-32	SS19-32	0 - 0.15	Background	03/10/2019	Soil	<0.005	<0.005	<0.005	<0.01	<0.004	<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	<0.01	<0.01	<0.005	<0.01	<0.0071
SS19-33	SS19-33	0 - 0.15	Background	03/10/2019	Soil	<0.005	<0.005	<0.005	<0.01	<0.004	<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	<0.01	<0.01	<0.005	<0.01	<0.0071
Guidelines						NG	0.28 [1]	320 [1]	NG	2.5 [2]	1 [3]	0.6 [4]	1 [5]	NG	NG	NG	1 [3]	6.2 [4]	1 [3]	50 [2]	0.25 [1]	1 [3]	0.013 [1]	NG	0.046 [1]	7.7 [4]	NG	NG	NG	NG	0.6|5.3 [6]

Comments

[1] CSQG PAH Residential/Parkland Use SQGFL
[2] CSQG PAH Residential/Parkland Use SQGSC
[3] CSQG PAH Residential/Parkland Use SQG Interim
[4] CSQG PAH Residential/Parkland Use SQGI
[5] CSQG PAH Residential/Parkland Use SQGE
[6] CSQG PAH Residential/Parkland Use SQGHH
PHC Petroleum Hydrocarbon
mg/kg Milligrams per Kilogram
NG No Guideline
APEC Area of Potential Environmental Concern
"-" Guideline does not apply as it is higher than another applicable Guideline
< Less than laboratory detection limits
BOLD Exceeds the referenced assessment criteria
Detection limit is greater than referenced assessment criteria

Table 6 - Soil Analytical Results - Metals

Location	Sample ID	Sample Depth (m)	APEC	Sample Date	Matrix	Aluminium	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium Total (III+VI)	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tin	Uranium	Vanadium	Zinc
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
					EQL	100	0.5	1	1	0.4	0.8	0.05	1	0.5	1	100	0.5	50	1	0.05	0.4	1	0.5	0.2	0.1	1	0.2	1	10
SS19-01	SS19-01	0 - 0.15	APEC 1	02/10/2019	soil	2600	<1.3	<2.5	450	<1	44	<0.13	<2.5	<1.3	25	2600	18	4500	41	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.81	3.5	<25
SS19-01	SS19-02	0 - 0.15	APEC 1	02/10/2019	soil	2600	<1.3	<2.5	420	<1	43	<0.13	<2.5	<1.3	59	2700	20	5000	42	<0.13	<1	<2.5	<1.3	<0.5	<0.25	5	0.83	4.1	<25
SS19-03	SS19-03	0 - 0.15	APEC 1	02/10/2019	soil	2800	<1.3	<2.5	440	<1	49	0.2	<2.5	<1.3	7.9	2700	24	3600	41	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.82	3.4	34
SS19-04	SS19-04	0 - 0.15	APEC 1	02/10/2019	soil	2000	1.4	<2.5	210	<1	24	0.22	3.8	<1.3	13	4100	19	21,000	90	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.63	4.9	67
SS19-05	SS19-05	0 - 0.15	APEC 1	02/10/2019	soil	2800	<1.3	<2.5	430	<1	58	0.66	3.7	<1.3	45	3100	62	3000	53	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.85	3.5	46
SS19-06	SS19-06	0 - 0.15	APEC 1	02/10/2019	soil	2600	<1.3	<2.5	370	<1	38	0.35	3	<1.3	21	3300	53	8100	57	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.87	4.1	99
SS19-07	SS19-07	0 - 0.15	APEC 1	02/10/2019	soil	2600	<1.3	<2.5	470	<1	48	0.19	3.9	<1.3	23	3100	16	3000	39	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.81	3.2	46
SS19-08	SS19-08	0 - 0.15	APEC 1	02/10/2019	soil	2300	<1.3	<2.5	320	<1	32	<0.13	2.7	<1.3	3.3	3400	19	9500	69	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.88	4.2	25
SS19-09	SS19-09	0 - 0.15	APEC 1	02/10/2019	soil	2100	<1.3	<2.5	200	<1	35	<0.13	3.2	<1.3	<2.5	3900	13	20,000	90	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.59	5.2	<25
SS19-10	SS19-10	0 - 0.15	APEC 1	02/10/2019	soil	2900	<1.3	<2.5	470	<1	46	0.16	3.2	<1.3	12	4700	28	3000	62	<0.13	<1	<2.5	<1.3	0.65	<0.25	<2.5	0.87	3.9	33
SS19-11	SS19-11	0 - 0.15	APEC 1	02/10/2019	soil	2600	<1.3	<2.5	260	<1	33	0.43	4.7	<1.3	8.8	6800	32	19,000	130	<0.13	<1	2.8	<1.3	<0.5	<0.25	2.9	0.69	5	45
SS19-12	SS19-12	0 - 0.15	APEC 1	02/10/2019	soil	2800	<1.3	4	430	<1	37	0.31	3.1	1.5	8.8	9300	23	2300	55	<0.13	<1	<2.5	<1.3	<0.5	<0.25	2.7	0.79	3.4	130
SS19-13	SS19-13	0 - 0.15	APEC 1	03/10/2019	soil	2200	<1.3	<2.5	440	<1	36	0.14	<2.5	<1.3	4.2	3100	14	3400	56	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.82	3.3	<25
	SS19-14	0 - 0.15	APEC 1	03/10/2019	soil	2200	<1.3	<2.5	430	<1	35	0.13	<2.5	<1.3	4	2800	14	3500	44	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.76	3.4	<25
SS19-15	SS19-15	0 - 0.15	APEC 1	03/10/2019	soil	2800	<1.3	<2.5	450	<1	49	0.19	2.6	2.2	19	3400	28	6300	59	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.87	4.2	27
SS19-16	SS19-16	0 - 0.15	APEC 1	03/10/2019	soil	2300	<1.3	<2.5	420	<1	27	0.13	<2.5	<1.3	2.8	3400	15	5500	83	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	1	4.4	<25
SS19-17	SS19-17	0 - 0.15	APEC 1	03/10/2019	soil	2700	<1.3	<2.5	400	<1	36	<0.13	<2.5	<1.3	2.6	4900	22	2800	86	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	1	3.7	<25
SS19-18	SS19-18	0 - 0.15	APEC 1	03/10/2019	soil	1400	<0.5	5.5	280	<0.4	6.6	0.093	1.6	0.55	13	6000	8.5	120	12	0.88	1.6	1.6	0.86	<0.2	0.47	<1	0.35	6.1	<10
SS19-19	SS19-19	0 - 0.15	APEC 1	03/10/2019	soil	2500	<1.3	<2.5	420	<1	35	0.27	<2.5	<1.3	8.1	2200	23	4300	43	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.83	3.2	31
SS19-20	SS19-20	0 - 0.15	APEC 1	03/10/2019	soil	2500	<1.3	<2.5	450	<1	31	0.18	<2.5	<1.3	3	2500	18	3000	40	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.99	3.5	<25
SS19-21	SS19-21	0 - 0.15	APEC 1	03/10/2019	soil	3200	<1.3	<2.5	460	<1	60	<0.13	<2.5	<1.3	2.7	3000	29	2000	52	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	1.1	4	<25
SS19-22	SS19-22	0 - 0.15	APEC 1	03/10/2019	soil	2600	<1.3	<2.5	490	<1	32	0.15	3.9	<1.3	3.5	2500	13	1800	37	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.78	3.3	<25
SS19-23	SS19-23	0 - 0.15	APEC 1	03/10/2019	soil	2400	<1.3	<2.5	420	<1	30	<0.13	<2.5	<1.3	2.5	3400	14	5700	60	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.77	3.7	<25
SS19-24	SS19-24	0 - 0.15	APEC 1	03/10/2019	soil	2600	<1.3	<2.5	**550**	<1	26	0.16	<2.5	<1.3	3.9	2600	25	3200	61	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.85	3.3	<25
SS19-25	SS19-25	0 - 0.15	APEC 1	03/10/2019	soil	2000	<1.3	<2.5	310	<1	27	<0.13	2.6	<1.3	2.7	3200	10	18,000	90	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.61	3.9	<25
SS19-26	SS19-26	0 - 0.15	APEC 1	03/10/2019	soil	2200	<1.3	<2.5	400	<1	31	<0.13	<2.5	<1.3	3.2	2400	15	2300	50	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.74	3.1	<25
SS19-27	SS19-27	0 - 0.15	APEC 1	03/10/2019	soil	2400	2.6	<2.5	430	<1	34	0.15	<2.5	<1.3	**930**	2500	31	2900	48	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.81	3.2	<25
SS19-28	SS19-28	0 - 0.15	APEC 1	03/10/2019	soil	2500	<1.3	<2.5	370	<1	32	0.15	<2.5	<1.3	4.6	3000	24	11,000	68	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.85	4.1	<25
SS19-29	SS19-29	0 - 0.15	APEC 2	03/10/2019	soil	970	<1	<2	41	<0.8	34	0.24	5.6	1.5	19	17,000	17	2800	270	0.22	1.1	7	<1	<0.4	<0.2	23	2.5	2.8	27
SS19-30	SS19-30	0 - 0.15	Background	03/10/2019	soil	1200	<0.5	1.2	8.1	<0.4	14	<0.05	3.7	1.1	1.6	3400	3.6	30,000	110	<0.05	<0.4	2.4	<0.5	<0.2	<0.1	<1	0.38	4.8	<10
	SS19-31	0 - 0.15	Background	03/10/2019	soil	1300	<0.5	1.4	9.6	<0.4	14	<0.05	3.6	1.1	1.7	3800	5.2	31,000	130	<0.05	<0.4	2.6	<0.5	<0.2	<0.1	<1	0.38	4.9	<10
SS19-32	SS19-32	0 - 0.15	Background	03/10/2019	soil	2000	<0.5	1.4	14	<0.4	15	<0.05	5.8	1.5	3.3	4900	2.6	26,000	95	<0.05	<0.4	3.5	<0.5	<0.2	<0.1	<1	0.48	7.8	<10
SS19-33	SS19-33	0 - 0.15	Background	03/10/2019	soil	5300	<0.5	2.2	39	<0.4	15	<0.05	17	3.7	7.1	10,000	5	27,000	180	<0.05	0.41	9.9	<0.5	<0.2	0.1	<1	1	19	18
Guidelines[1]						NG	20	12	500	4	NG	10	64	50	63	NG	140	NG	NG	6.6	10	45	1	20	1	50	23	130	250

Comments

[1] Canadian Soil Quality Guideline Residential/Parkland Land Use, Coarse Grained (CCME 2008)
PHC Petroleum Hydrocarbon
mg/kg Milligrams per Kilogram
NG No Guideline
APEC Area of Potential Environmental Concern
"-" Guideline does not apply as it is higher than another applicable Guideline
< Less than laboratory detection limits
BOLD Exceeds the referenced assessment criteria
Detection limit is greater than referenced assessment criteria

Table 7 - Soil QAQC

					Petroleum Hydrocarbons							
					Benzene	Toluene	Ethylbenzene	Xylenes Total	PHC F1 (C6-C10) - BTEX	PHC F2 (C10-C16)	PHC F3 (C16-C34)	PHC F4 (C34-C50)
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				EQL	0.005	0.05	0.01	0.045	10	10	50	50
Location	Sample ID	Sample Depth (m)	Sample Date	Matrix								
SS19-01	SS19-01	0 - 0.15	2/Oct/19	Soil	<0.012	<0.08	0.16	0.48	<24	97	230	<50
	SS19-02	0 - 0.15	2/Oct/19	Soil	<0.012	<0.08	0.18	0.49	<23	94	220	<50
RPD					n.c.	n.c.	-12	-2	n.c.	3	4	n.c.
SS19-13	SS19-13	0 - 0.15	3/Oct/19	Soil	0.014	<0.1	0.42	1.1	<24	130	370	63
	SS19-14	0 - 0.15	3/Oct/19	Soil	<0.014	<0.1	0.48	1.2	<29	170	430	72
RPD					n.c.	n.c.	-13	-9	n.c.	-27	-15	-13
SS19-30	SS19-30	0 - 0.15	3/Oct/19	Soil	<0.005	<0.05	<0.01	<0.045	<10	<10	<50	<50
	SS19-31	0 - 0.15	3/Oct/19	Soil	<0.01	<0.08	<0.021	<0.092	<21	<21	<100	<100
RPD					n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.

Comments

*RPDs have only been considered where a concentration is greater than 5 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (> 5 x EQL)

'RPD Relative Percent Difference

EQL Estimated Quantitation Limit

BOLD Greater than recommended RPD value

n.c. - Not Calculated

"-" not analyzed

mg/kg - milligrams per kilogram

Table 7 - Soil QAQC

					Metals											
					Aluminium	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium Total (III+VI)	Cobalt	Copper	Iron	Lead
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				EQL	100	0.5	1	1	0.4	0.8	0.05	1	0.5	1	100	0.5
Location	Sample ID	Sample Depth (m)	Sample Date	Matrix												
SS19-01	SS19-01	0 - 0.15	2/Oct/19	Soil	2600	<1.3	<2.5	450	<1	44	<0.13	<2.5	<1.3	25	2600	18
	SS19-02	0 - 0.15	2/Oct/19	Soil	2600	<1.3	<2.5	420	<1	43	<0.13	<2.5	<1.3	59	2700	20
RPD					0	n.c.	n.c.	7	n.c.	2	n.c.	n.c.	n.c.	-81	-4	-11
SS19-13	SS19-13	0 - 0.15	3/Oct/19	Soil	2200	<1.3	<2.5	440	<1	36	0.14	<2.5	<1.3	4.2	3100	14
	SS19-14	0 - 0.15	3/Oct/19	Soil	2200	<1.3	<2.5	430	<1	35	0.13	<2.5	<1.3	4	2800	14
RPD					0	n.c.	n.c.	2	n.c.	3	7	n.c.	n.c.	5	10	0
SS19-30	SS19-30	0 - 0.15	3/Oct/19	Soil	1200	<0.5	1.2	8.1	<0.4	14	<0.05	3.7	1.1	1.6	3400	3.6
	SS19-31	0 - 0.15	3/Oct/19	Soil	1300	<0.5	1.4	9.6	<0.4	14	<0.05	3.6	1.1	1.7	3800	5.2
RPD					-8	n.c.	-15	-17	n.c.	0	n.c.	3	0	-6	-11	-36

Comments

*RPDs have only been considered where a concentration is greater than 5 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (> 5 x EQL)

'RPD Relative Percent Difference

EQL Estimated Quantitation Limit

BOLD Greater than recommended RPD value

n.c. - Not Calculated

"-" not analyzed

mg/kg - milligrams per kilogram

Table 7 - Soil QAQC

					Metals											
					Magnesium	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tin	Uranium	Vanadium	Zinc
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				EQL	50	1	0.05	0.4	1	0.5	0.2	0.1	1	0.2	1	10
Location	Sample ID	Sample Depth (m)	Sample Date	Matrix												
SS19-01	SS19-01	0 - 0.15	2/Oct/19	Soil	4500	41	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.81	3.5	<25
	SS19-02	0 - 0.15	2/Oct/19	Soil	5000	42	<0.13	<1	<2.5	<1.3	<0.5	<0.25	5	0.83	4.1	<25
RPD					-11	-2	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	-2	-16	n.c.
SS19-13	SS19-13	0 - 0.15	3/Oct/19	Soil	3400	56	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.82	3.3	<25
	SS19-14	0 - 0.15	3/Oct/19	Soil	3500	44	<0.13	<1	<2.5	<1.3	<0.5	<0.25	<2.5	0.76	3.4	<25
RPD					-3	24	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	8	-3	n.c.
SS19-30	SS19-30	0 - 0.15	3/Oct/19	Soil	30,000	110	<0.05	<0.4	2.4	<0.5	<0.2	<0.1	<1	0.38	4.8	<10
	SS19-31	0 - 0.15	3/Oct/19	Soil	31,000	130	<0.05	<0.4	2.6	<0.5	<0.2	<0.1	<1	0.38	4.9	<10
RPD					-3	-17	n.c.	n.c.	-8	n.c.	n.c.	n.c.	n.c.	0	-2	n.c.

Comments

*RPDs have only been considered where a concentration is greater than 5 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (> 5 x EQL)

'RPD Relative Percent Difference

EQL Estimated Quantitation Limit

BOLD Greater than recommended RPD value

n.c. - Not Calculated

"-" not analyzed

mg/kg - milligrams per kilogram

Table 7 - Soil QAQC

					Polycyclic Aromatics								
					2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Acridine	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b+j)fluoranthene	Benzo(c)phenanthrene
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				EQL	0.005	0.005	0.005	0.01	0.004	0.005	0.005	0.005	0.005
Location	Sample ID	Sample Depth (m)	Sample Date	Matrix									
SS19-01	SS19-01	0 - 0.15	2/Oct/19	Soil	0.12	<0.005	0.009	0.015	<0.004	0.0089	<0.005	0.0086	<0.005
	SS19-02	0 - 0.15	2/Oct/19	Soil	0.12	<0.005	0.0082	0.016	<0.004	0.01	<0.005	0.012	<0.005
RPD					0	n.c.	9	-6	n.c.	-12	n.c.	-33	n.c.
SS19-13	SS19-13	0 - 0.15	3/Oct/19	Soil	0.15	<0.005	0.013	0.015	<0.004	0.018	<0.005	0.015	<0.005
	SS19-14	0 - 0.15	3/Oct/19	Soil	0.23	<0.005	0.015	0.019	<0.004	0.014	<0.005	0.014	<0.005
RPD					-42	n.c.	-14	-24	n.c.	25	n.c.	7	n.c.
SS19-30	SS19-30	0 - 0.15	3/Oct/19	Soil	<0.005	<0.005	<0.005	<0.01	<0.004	<0.005	<0.005	<0.005	<0.005
	SS19-31	0 - 0.15	3/Oct/19	Soil	<0.0095	<0.0095	<0.0095	<0.019	<0.0076	<0.0095	<0.0095	<0.0095	<0.0095
RPD					n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.

Comments

*RPDs have only been considered where a concentration is greater than 5 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (> 5 x EQL)

'RPD Relative Percent Difference

EQL Estimated Quantitation Limit

BOLD Greater than recommended RPD value

n.c. - Not Calculated

"-" not analyzed

mg/kg - milligrams per kilogram

Table 7 - Soil QAQC

					Polycyclic Aromatics								
					Benzo(e)pyrene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				EQL	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Location	Sample ID	Sample Depth (m)	Sample Date	Matrix									
SS19-01	SS19-01	0 - 0.15	2/Oct/19	Soil	<0.005	<0.005	<0.005	0.009	<0.005	0.049	<0.005	<0.005	0.042
	SS19-02	0 - 0.15	2/Oct/19	Soil	0.0075	<0.005	<0.005	0.012	<0.005	0.054	<0.005	<0.005	0.04
RPD					n.c.	n.c.	n.c.	-29	n.c.	-10	n.c.	n.c.	5
SS19-13	SS19-13	0 - 0.15	3/Oct/19	Soil	0.0082	<0.005	<0.005	0.021	<0.005	0.091	0.0075	<0.005	0.051
	SS19-14	0 - 0.15	3/Oct/19	Soil	0.0078	<0.005	<0.005	0.021	<0.005	0.083	0.009	<0.005	0.098
RPD					5	n.c.	n.c.	0	n.c.	9	-18	n.c.	-63
SS19-30	SS19-30	0 - 0.15	3/Oct/19	Soil	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SS19-31	0 - 0.15	3/Oct/19	Soil	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095	<0.0095
RPD					n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.

Comments

*RPDs have only been considered where a concentration is greater than 5 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (> 5 x EQL)

'RPD Relative Percent Difference

EQL Estimated Quantitation Limit

BOLD Greater than recommended RPD value

n.c. - Not Calculated

"-" not analyzed

mg/kg - milligrams per kilogram

Table 7 - Soil QAQC

					Polycyclic Aromatics								
					Perylene	Phenanthrene	Pyrene	Quinoline	Light Molecular Weight (PAH Sum)	Heavy Molecular Weight (PAH Sum)	PAHs (Sum of total)	B(a)P Total Potency Equivalent	Index of Additive Cancer Risk (IACR)
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-
				EQL	0.005	0.005	0.005	0.01	0.01	0.005	0.01	0.0071	0.1
Location	Sample ID	Sample Depth (m)	Sample Date	Matrix									
SS19-01	SS19-01	0 - 0.15	2/Oct/19	Soil	0.011	0.057	0.056	<0.01	0.24	0.13	0.37	<0.0071	0.12
	SS19-02	0 - 0.15	2/Oct/19	Soil	0.017	0.065	0.058	<0.01	0.25	0.15	0.39	0.008	0.14
RPD					-43	-13	-4	n.c.	-4	-14	-5	n.c.	-15
SS19-13	SS19-13	0 - 0.15	3/Oct/19	Soil	0.013	0.093	0.13	<0.01	0.33	0.27	0.6	0.009	0.19
	SS19-14	0 - 0.15	3/Oct/19	Soil	0.014	0.12	0.099	<0.01	0.49	0.23	0.72	0.009	0.17
RPD					-7	-25	27	n.c.	-39	16	-18	0	11
SS19-30	SS19-30	0 - 0.15	3/Oct/19	Soil	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.01	<0.0071	<0.1
	SS19-31	0 - 0.15	3/Oct/19	Soil	<0.0095	<0.0095	<0.0095	<0.019	<0.019	<0.0095	<0.019	<0.014	0.11
RPD					n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.

Comments

*RPDs have only been considered where a concentration is greater than 5 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (> 5 x EQL)

'RPD Relative Percent Difference

EQL Estimated Quantitation Limit

BOLD Greater than recommended RPD value

n.c. - Not Calculated

"-" not analyzed

mg/kg - milligrams per kilogram

Appendix A

Site Photographs

Photo 1: Looking West from the Entrance of the Site

Notes:

Photo 2: Looking North at Churchill River Mushing Building

Notes:

Photo 3: Looking Northwest at Churchill River Mushing Building

Notes:

Photo 4: Looking South at Monument Located at the Entrance of the Site

Notes:

Photo 5: Looking East at the Aluminum Building Located on the West Side of the Site (The Sweat Lodge)

Notes:

Photo 6: Looking at Building Footing

Notes:

Photo 7: Coal Pile near Building Footing

Notes:

Photo 8: Looking at Building Footing with Debris (Metal, Wood, Shingles)

Notes:

Photo 9: Looking at Metal Buckets on the Site at APEC 2

Notes:

Photo 10: Metal Drum Full of Sand Located on the Site

Notes:

Photo 11: Hydro Sub-Station Located North East of the Site

Notes:

Photo 12: Metal Scrap Yard Located South East of the Site

Notes:

Photo 13: CN Rail Line Located South and West of the Site

Notes:

Photo 14: Samples AS-01 – Vinyl Floor Tiles and Associated Mastic

Notes:

Asbestos (0.63% to 1.2% Chrysotile) was found to be present vinyl floor tiles. Three of the five associated mastic samples were determined to contain asbestos (1% to 4% Chrysotile).

Photo 15: Sample AS-02 – “Transite” Cement Board

Notes:

Asbestos (15% Chrysotile) was found in one sample and a positive stop was applied to the other two samples.

Photo 16: Sample AS-03B – Asphalt Roof Shingles

Notes:

No asbestos was identified in the samples of this material.

Appendix B

Physical Setting Report

PSR
PHYSICAL SETTING REPORT

Property Information

Order Number:	20190924107p
Date Completed:	September 25, 2019
Project Number:	MK0500-85-02
Project Property:	Churchill Dene PH 1 MK0500-85-02 Churchill MB
Coordinates:	
Latitude:	58.73447777
Longitude:	-94.11755685
UTM Northing:	6510843.95666 Metres
UTM Easting:	435294.231194 Metres
UTM Zone:	UTM Zone 15V
Elevation:	8.00 m
Slope Direction:	N/A

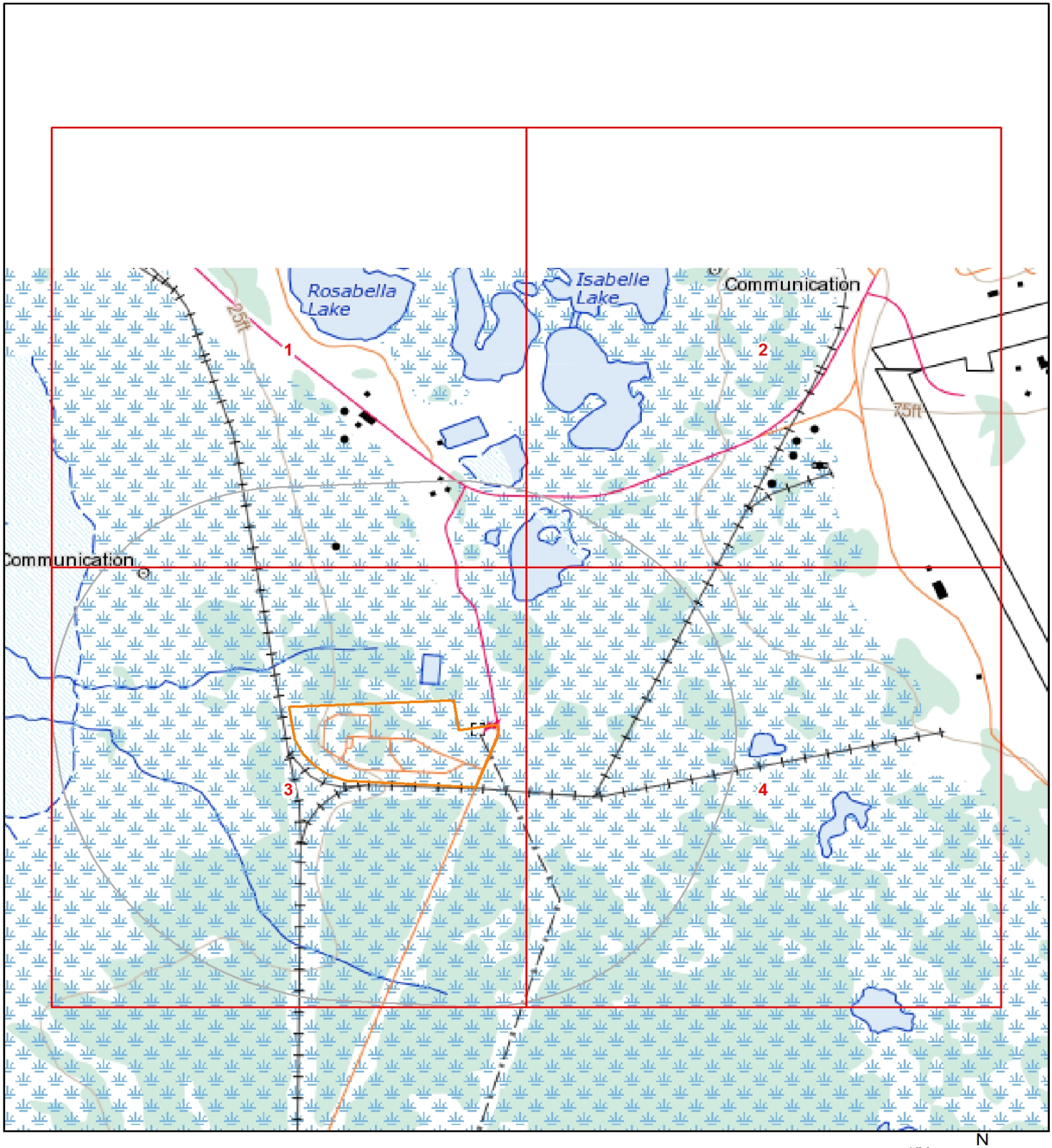
The ERIS ***Physical Setting Report - PSR*** provides comprehensive information about the physical setting around a site and includes a complete overview of topography as well as hydrologic, geologic and soil characteristics. The location and detailed attributes of oil and gas wells, water wells, and radon are also included for review.

The compilation of both physical characteristics of a site and additional attribute data is useful in assessing the impact of migration of contaminants and subsequent impact on soils and groundwater.

Disclaimer

This Report does not provide a full environmental evaluation for the site or adjacent properties. Please see the terms and disclaimer at the end of the Report for greater detail.

Topographic Information



Topographic Map

KM
0.4 0.2 0 0.4 0.8

N

Address: MK0500-85-02,Churchill,MB

Data source: Toporama (1:50K) by Natural Resource Canada. Publication date: 2013-07-19
Legend available at ftp://ftp.geogratis.gc.ca/pub/nrcan_rncan/raster/toporama/doc/Toporama_en_Legend.pdf

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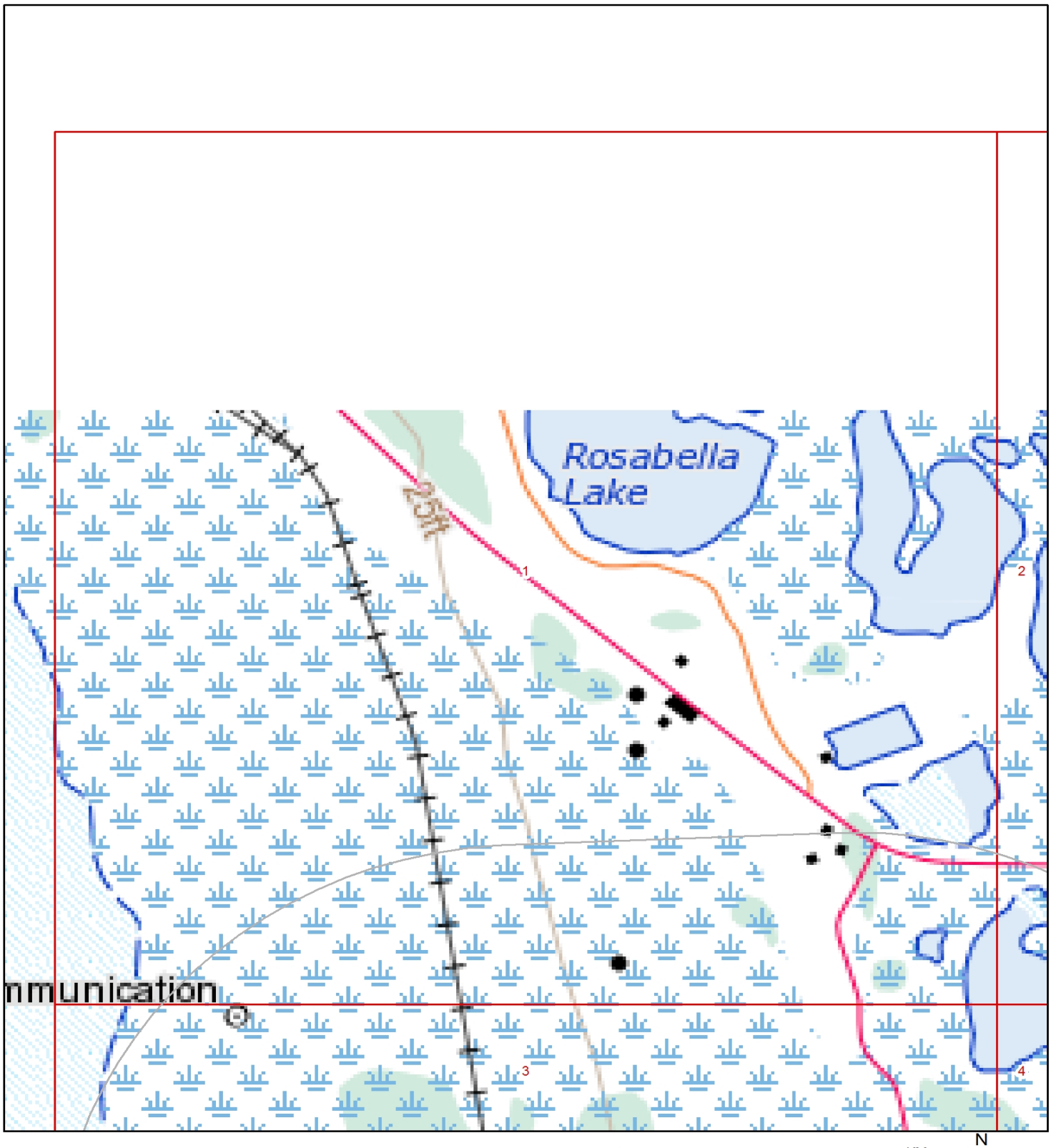
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Topographic Map - Page 1

0.2 0.1 0 0.2 0.4 KM

N

Data source: Toporama (1:50K) by Natural Resource Canada.

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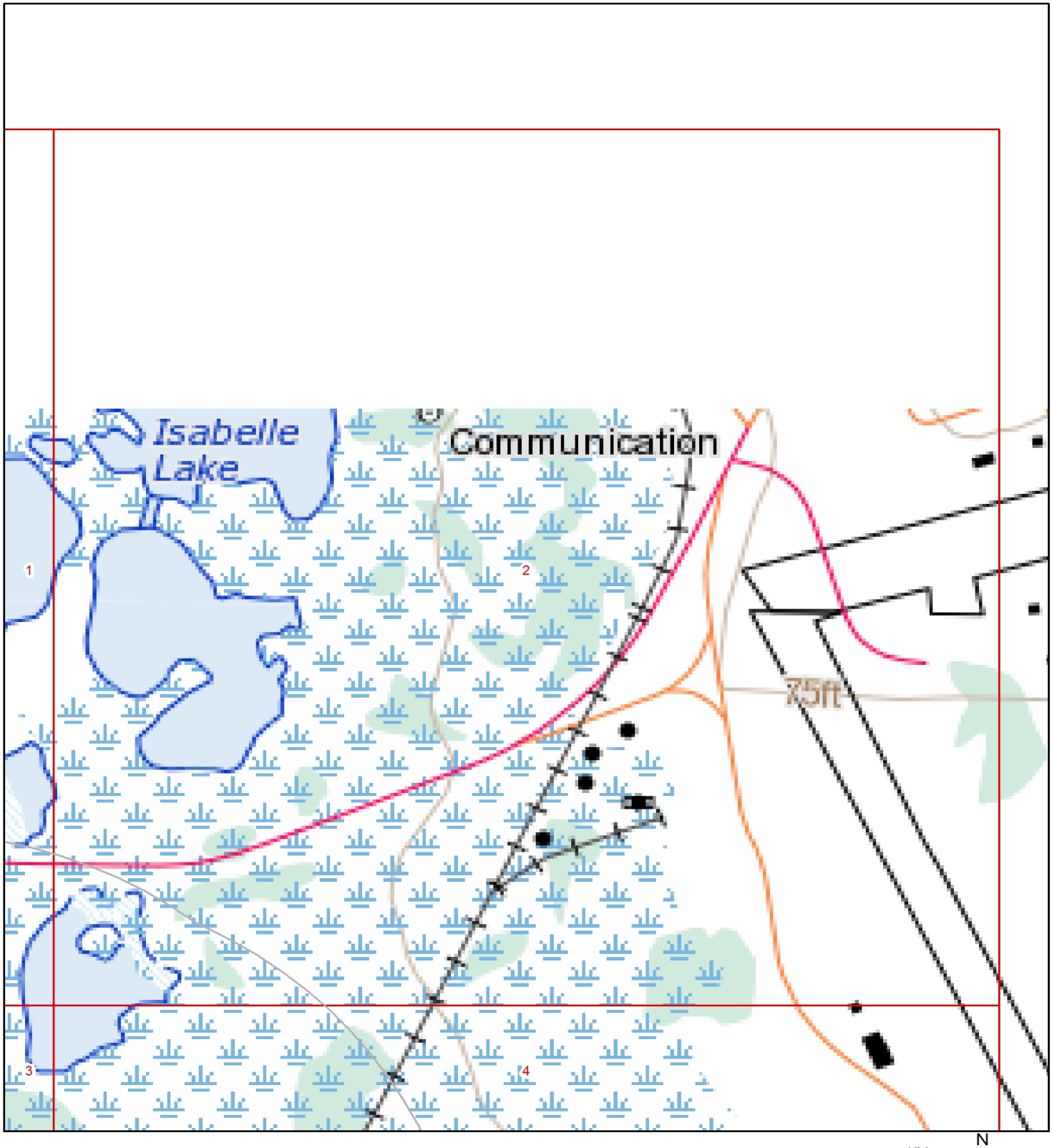
Topographic Information



Topographic Map - Page 2

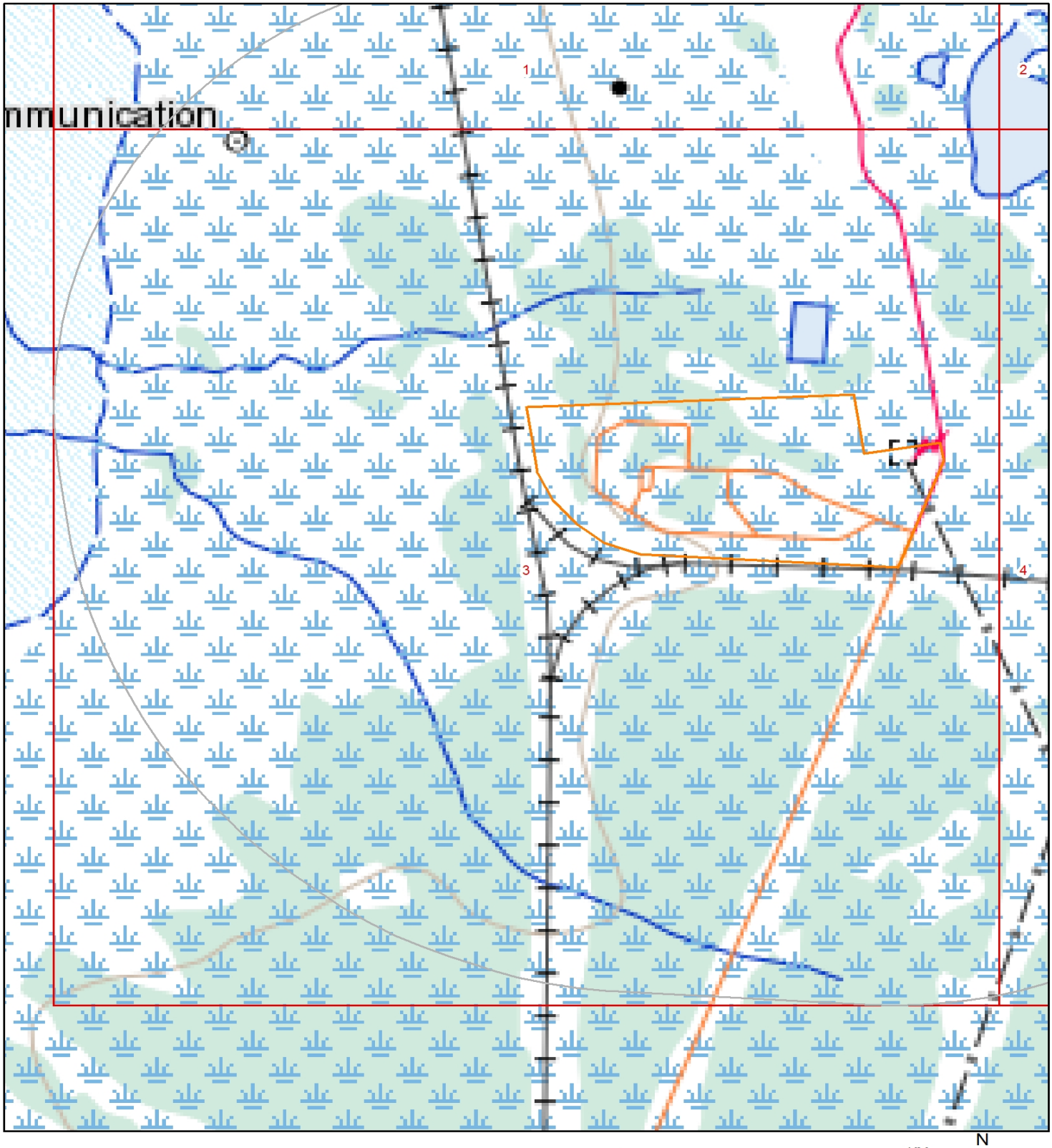
0.2 0.1 0 0.2 0.4 KM

N

Data source: Toporama (1:50K) by Natural Resource Canada.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Topographic Map - Page 3

0.2 0.1 0 0.2 0.4 KM

N

Data source: Toporama (1:50K) by Natural Resource Canada.

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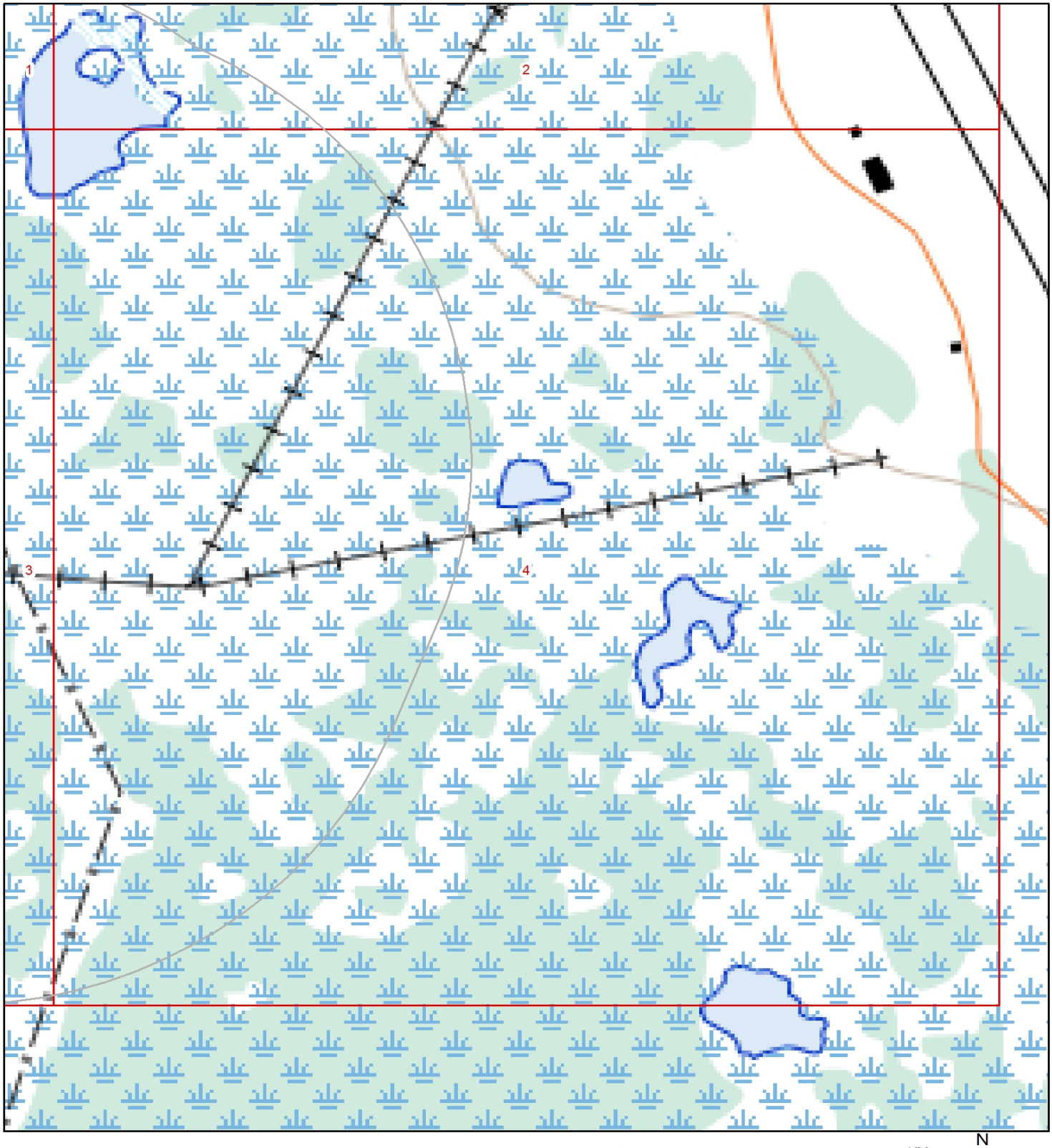
Topographic Information



Topographic Map - Page 4

0.2 0.1 0 0.2 0.4 KM

N

Data source: Toporama (1:50K) by Natural Resource Canada.

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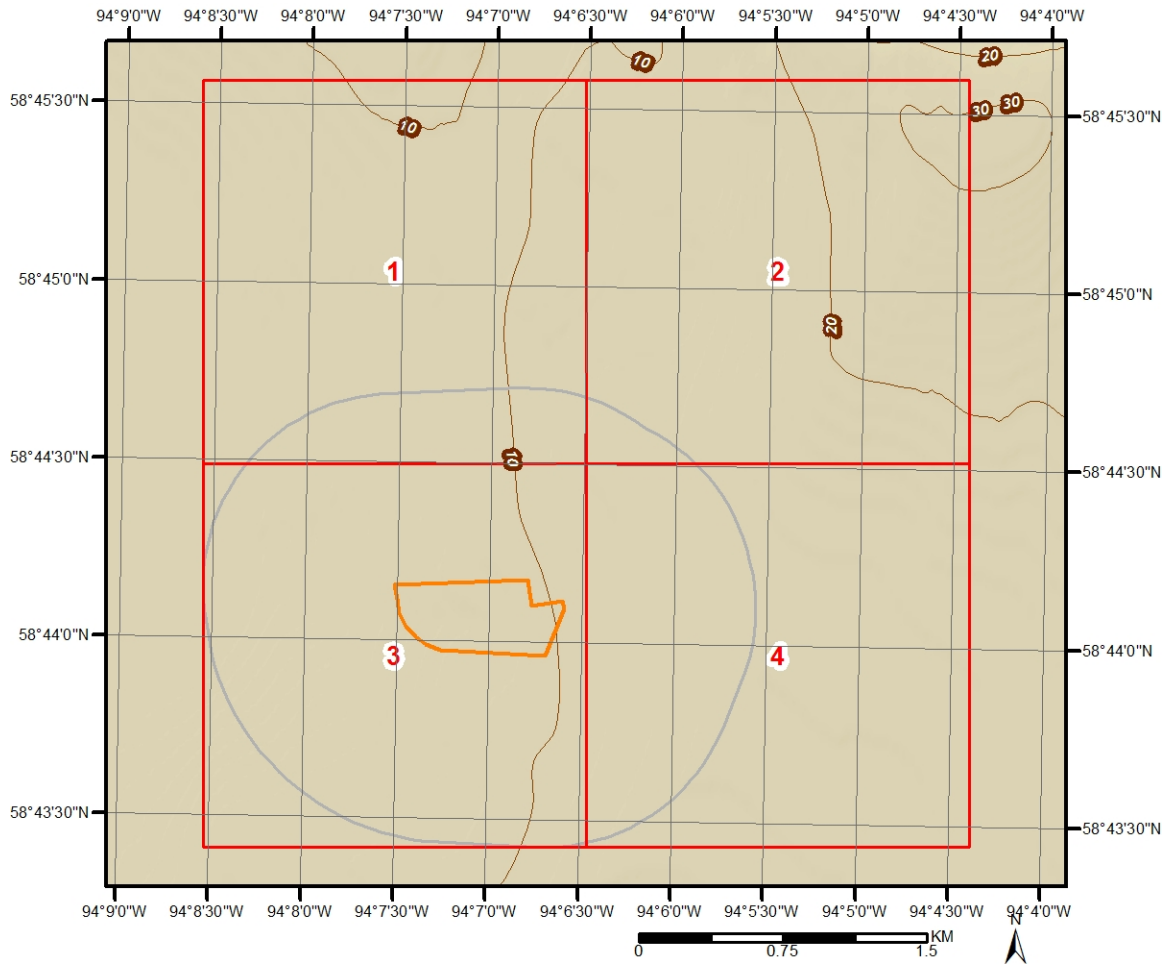
Topographic Information

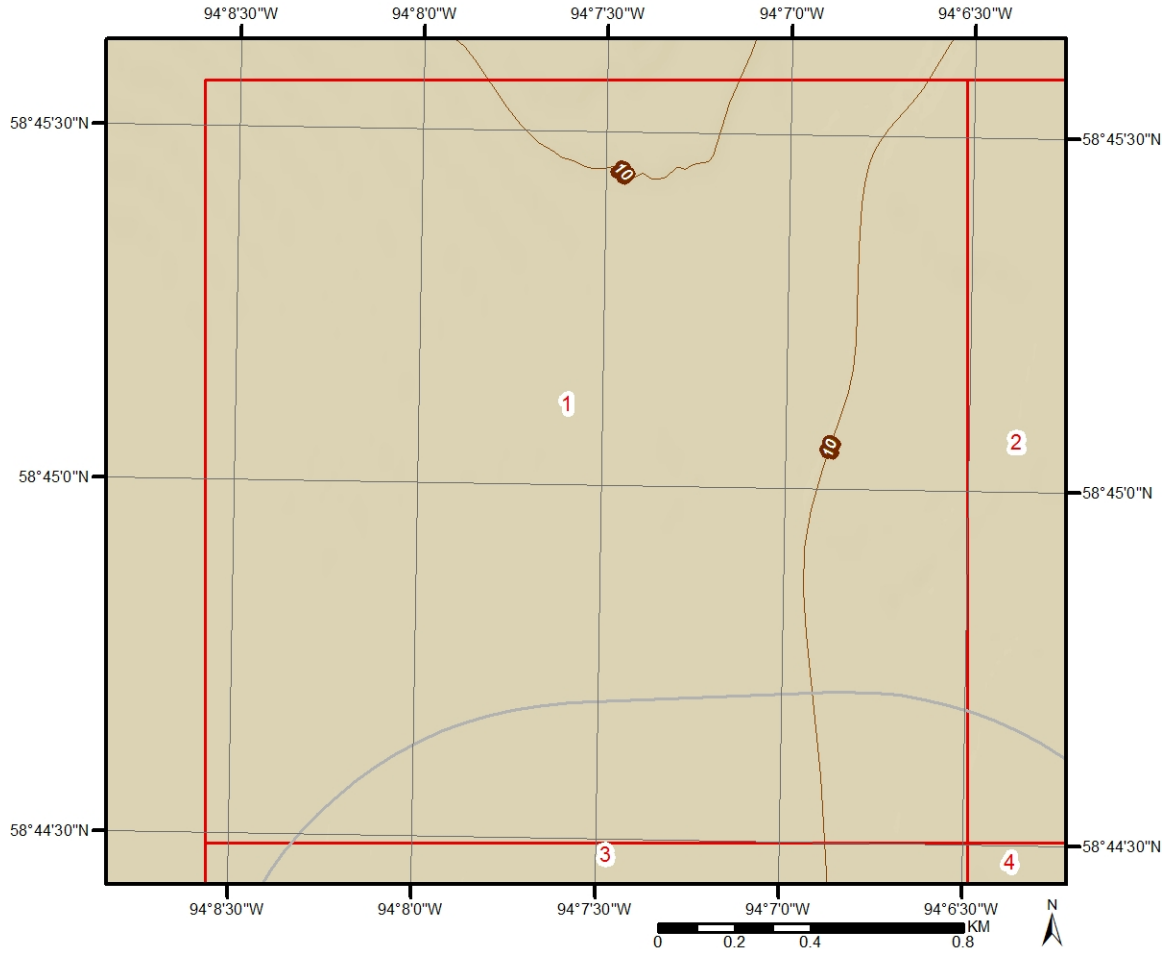
The previous topographic map(s) show general topographic information in the surrounding area of the project property, using Toporama data or a provincial source when available. Below are shaded relief map(s), derived from Digital Elevation data to depict terrain in further detail.

Topographic information at project property:

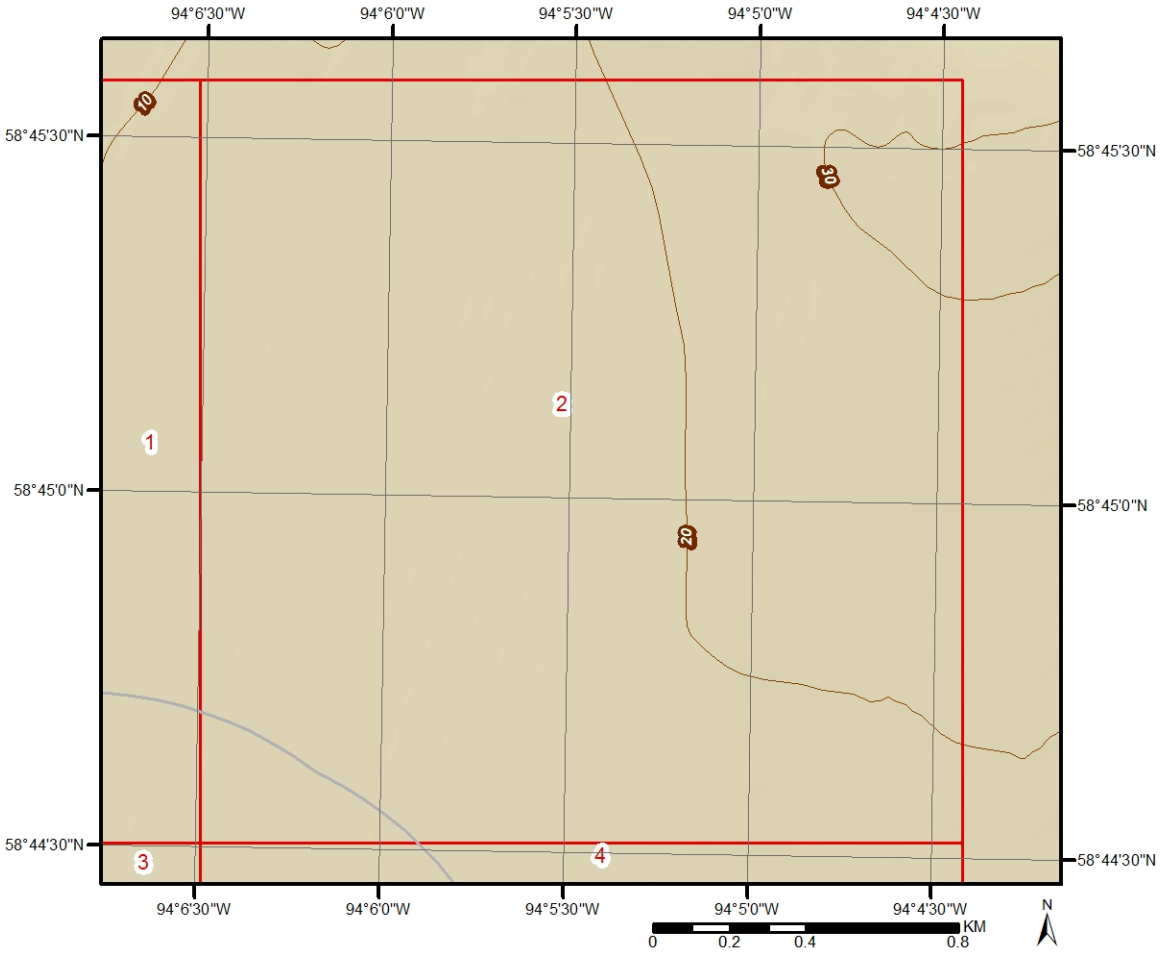
Elevation:	8.00 m
Slope Direction:	N/A



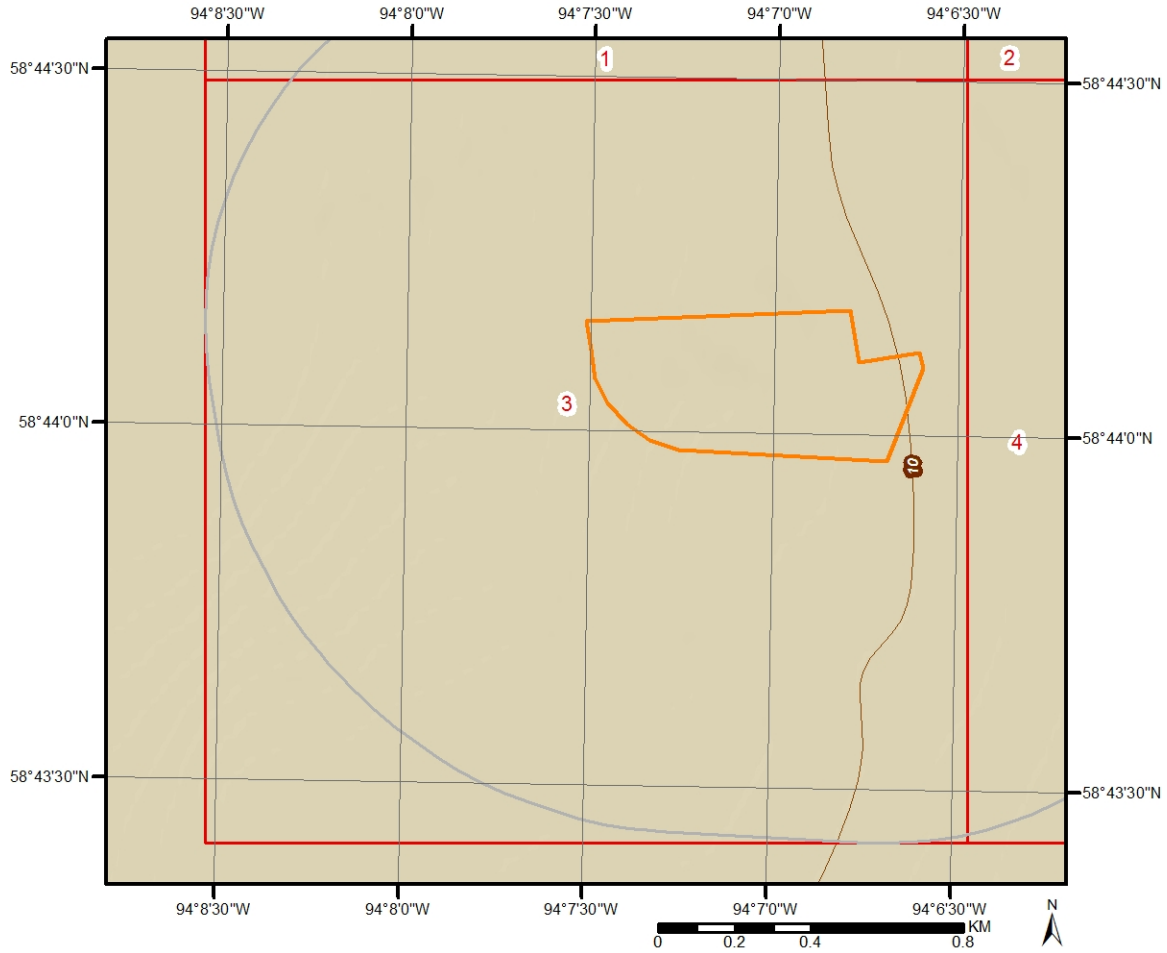
Topographic Information



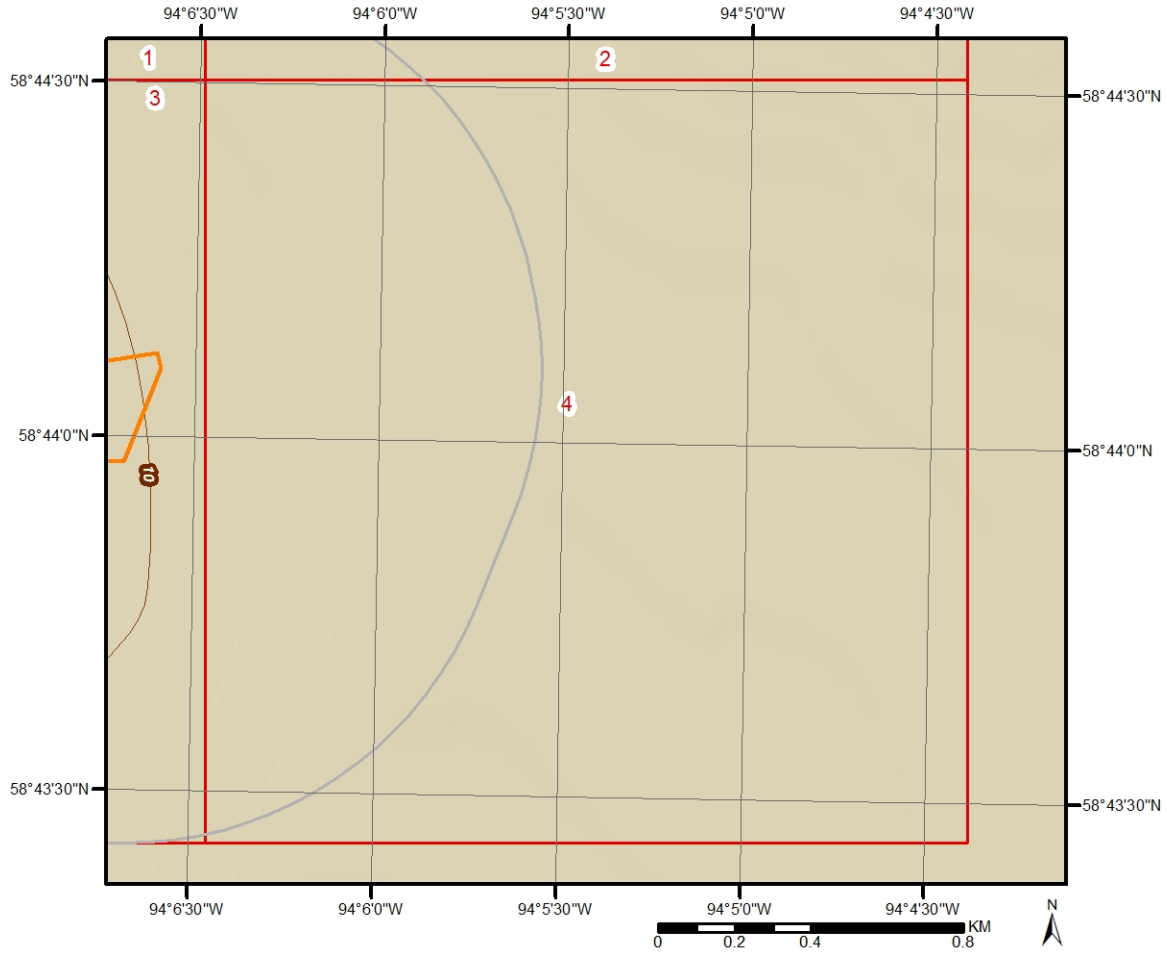
Topographic Information



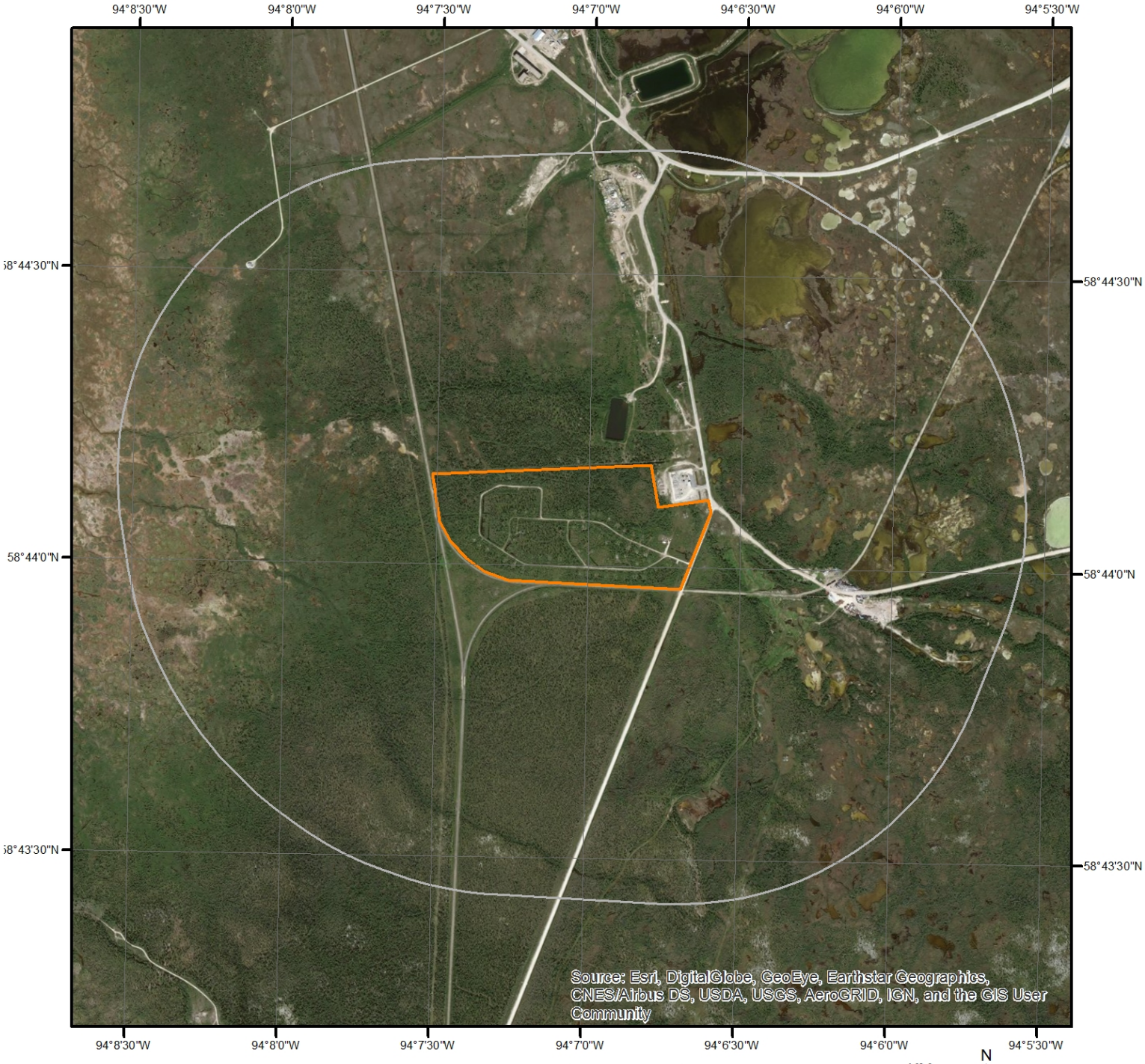
Topographic Information



Topographic Information



Hydrologic Information

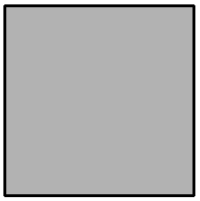


Wetland

0 0.175 0.35 0.7 1.05 KM

N

This map shows wetland existence. Data coverage is shown to the right.
Gray indicates no data available in the area.



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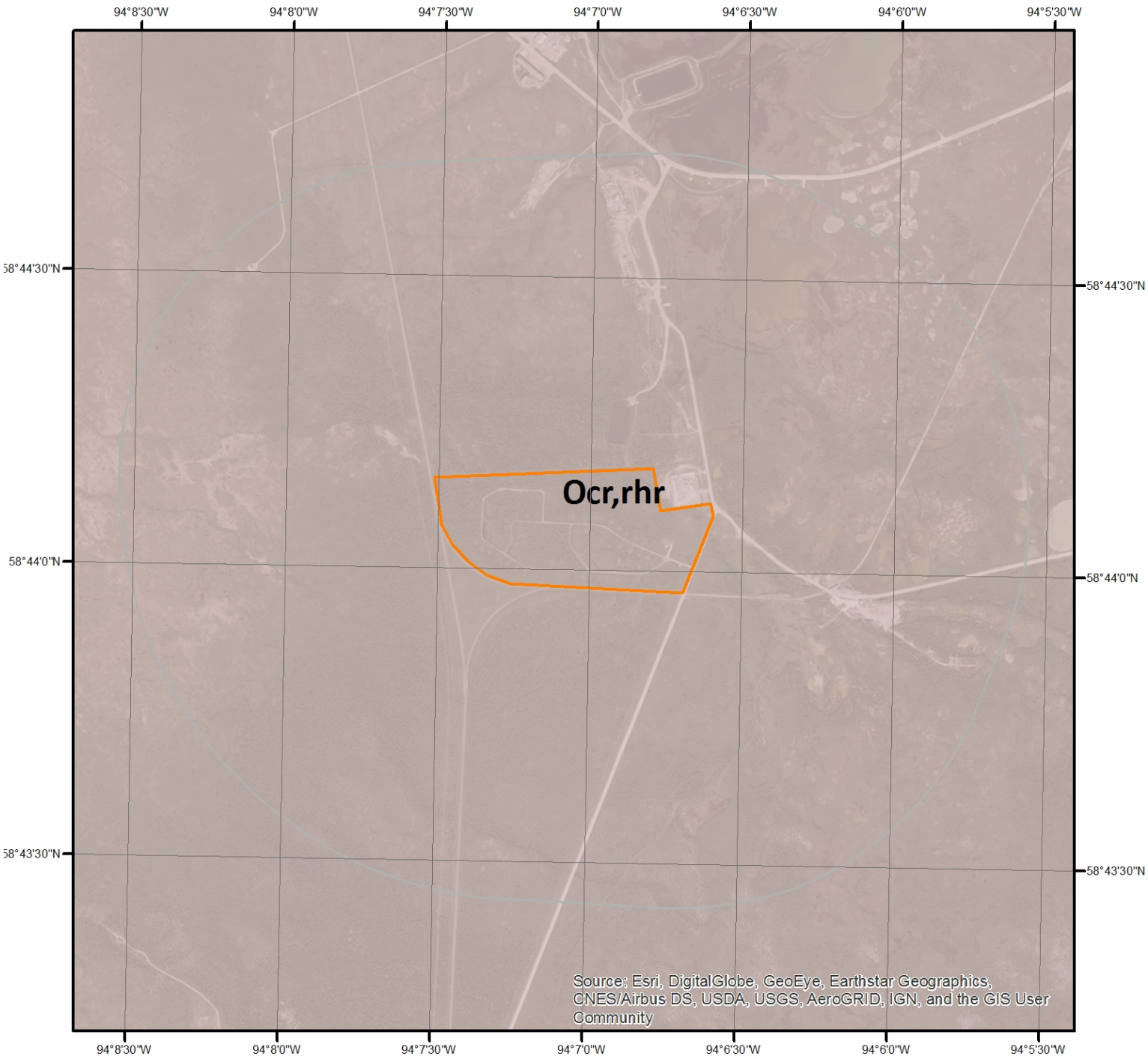
Geologic Information



Bedrock Geology

0 0.2 0.4 0.8 KM

N

This map shows bedrock geologic units in the area. Please refer to the report for detailed descriptions. Data coverage is shown to the right. Gray indicates no data available in the area.

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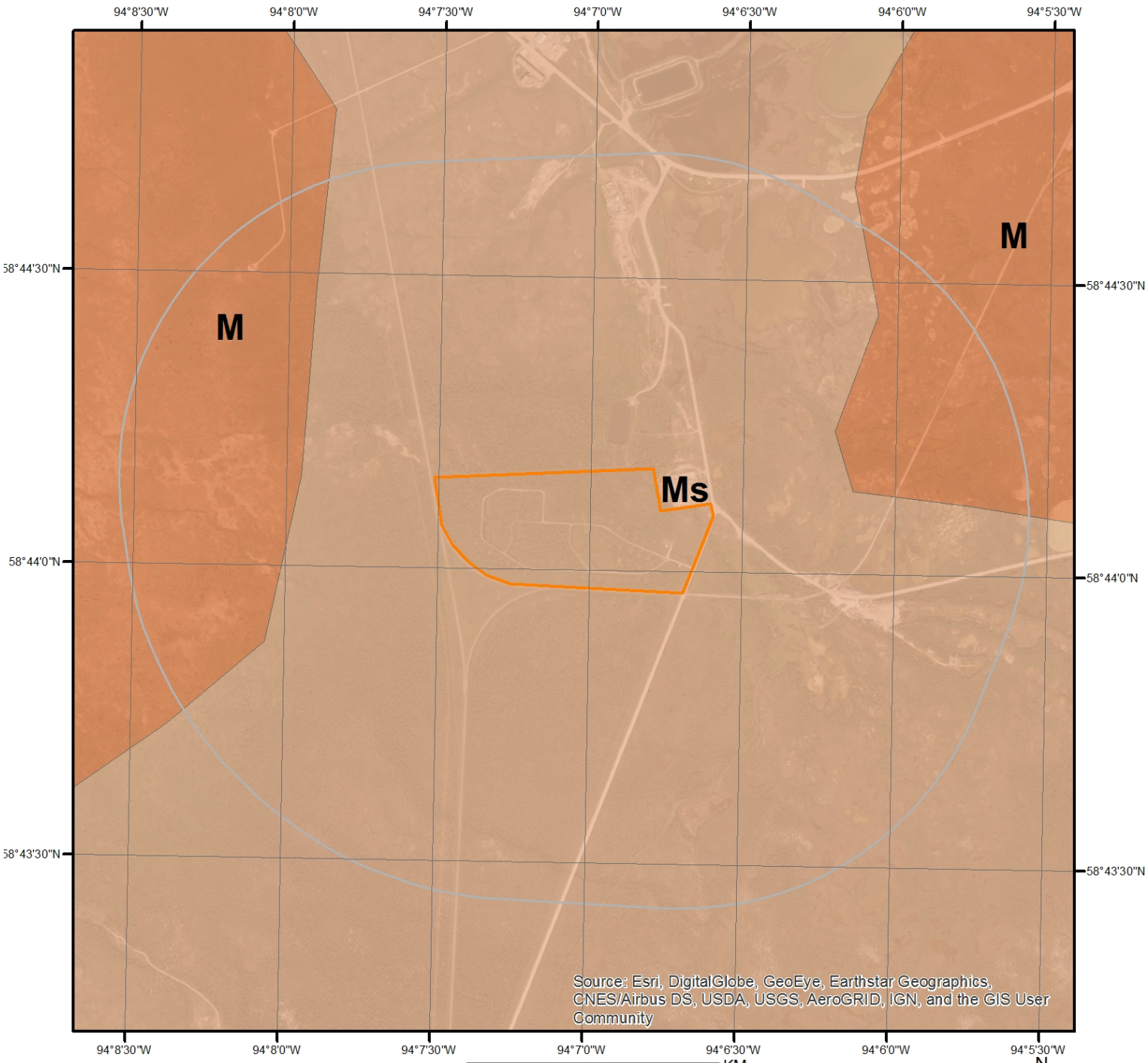
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information

Detailed bedrock geology information about each unit within the search radius is provided below.

Unit ID Ocr,rhr

Unit Name:	Caution Creek and Chasm Creek Formations - limestone, dolomitic and argillaceous; Red Head Rapids Formation - dolomite
Sub Unit Name:	PHANEROZOIC
Unit Description:	Ocr,rhr Dolomite, limestone
Eon:	Phanerozoic
Era:	Paleozoic
Period:	Ordovician
Epoch:	NULL
Province:	Hudson Bay Basin
Lithology:	Churchill River Group



Surficial Geology

This map shows surficial geologic labels in the area. Please refer to the report for detailed descriptions. Data coverage is shown to the right. Gray indicates no data available in the area.

Geologic Information

Detailed surficial geology information about each unit within the search radius is provided below.

Unit ID Ms

Legend Description:	MARGINAL GLACIOMARINE SEDIMENTS: littoral sand and gravel; 1-10 m thick; beach ridges, spits, bars; formed by waves at the margin of the glacial Tyrell Sea and present-day Hudson Bay

---

Unit ID M

Legend Description:	OFFSHORE GLACIOMARINE SEDIMENTS: clay, silt, minor sand; 1-20 m thick; very low relief massive and laminated deposits which are typically overlain by peat; deposited from suspension in the deep water of the glacial Tyrell Sea

Soil Information

Soil Map

0 0.2 0.4 0.8 1.2 KM

N

This map shows soil units around the target property. Please refer to the report for detailed soil descriptions.

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ENVIRONMENTAL RISK INFORMATION SERVICES

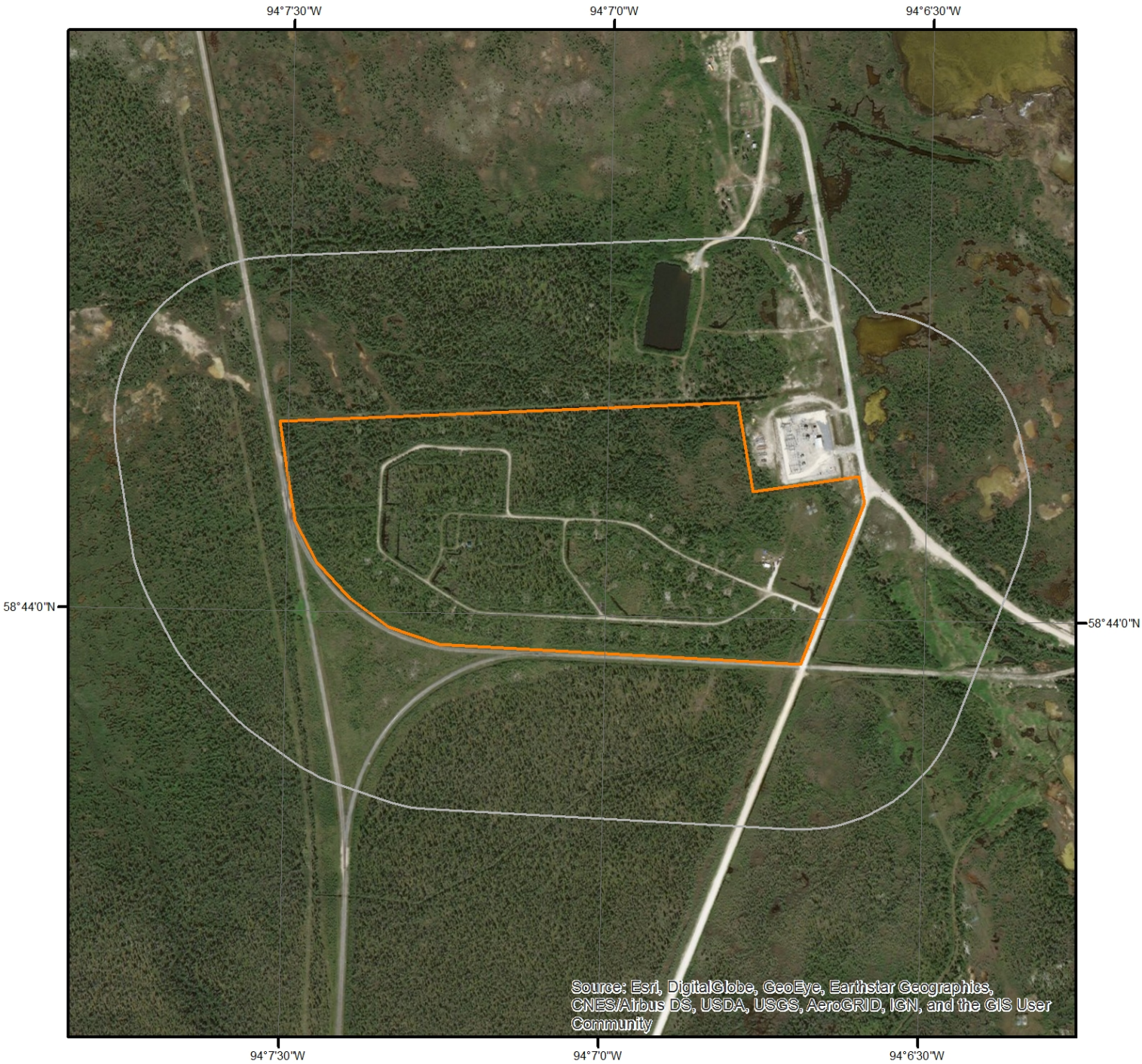
Soil Information

Detailed soil information about each unit within the search radius is provided below.

Soil Landscapes of Canada (SLC)

SLC Polygon ID: 1021002

Wells and Additional Sources



Wells & Additional Sources

0 0.15 0.3 0.6 KM

N

- Project Property
- Buffer
- Buffer
- Buffer
- Buffer
- Sites with Higher Elevation
- Sites with Same Elevation
- Sites with Lower Elevation
- Sites with Unknown Elevation

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ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources Summary

Federal Sources

National Energy Board Wells

Map Key	ID	Distance (m)	Direction
	No records found		

Provincial Sources

Manitoba Oil and Gas Wells

Map Key	ID	Distance (m)	Direction
	No records found		

Water Well Inventory

Map Key	ID	Distance (m)	Direction
	No records found		

Private Sources

Oil and Gas Wells

Map Key	ID	Distance (m)	Direction
	No records found		

Wells and Additional Sources Detail Report

No records found for the project property or surrounding properties.

Radon Information

Detailed radon information for the project property is provided below.

Radon Zone Information

ID:	144853	**Radon Rank:**	ICE

Health Canada Radon Information

Health Region:	4685
Health Region Name:	Burntwood/Churchill
Province or Territory:	MB
Number Homes in Survey:	152
% Below 200 Bq/m3:	92.1
% Above 200 Bq/m3:	7.9
200 to 600 Bq/m3:	7.2
% Above 600 Bq/m3:	0.7

Appendix

Federal Sources

Bedrock Geology of Canada — **BEDROCK GEOLOGY**

The Geological Map of Canada is scaled at 1:5,000,000. This map is created by Geological Survey of Canada and published by Natural Resources Canada.

Health Canada Radon Information — **RADON**

This source is the results from the Cross-Canada Survey of Radon Concentrations in Homes, a two-year study conducted by Health Canada's National Radon Program. The aims of this study were to obtain an estimate of the proportion of the Canadian population living in homes with radon gas levels above the guideline of 200 Bq/m3, to identify previously unknown areas where radon gas exposure may constitute a health risk, and to build, over time, a map of indoor radon gas exposure levels across Canada.

National Energy Board Wells — **NEBP**

The NEBW database contains information on onshore & offshore oil and gas wells that are outside provincial jurisdiction(s) and are thereby regulated by the National Energy Board. Data is provided regarding the operator, well name, well ID No./UWI, status, classification, well depth, spud and release date.

Soil Landscapes of Canada (SLC) — **SLC**

Major characteristics of soil and land such as surface form, slope, water table depth, permafrost and lakes.

Surficial Geology of Canada — **SURFICIAL GEOLOGY**

This map contains information on surficial materials and associated landforms left by the retreat of the last glaciers and non glacial environments. It is based on compilation of existing maps. This data was authored by the Geological Survey of Canada and published by Natural Resources Canada.

Toporama — **TOPORAMA**

Toporama covers the entire area of Canada's landmass and provides topographic, geo-referenced, and symbolic information in a raster format at 1:50,000 scale. This is a digital topographic reference product made available by Natural Resources Canada (NRCan).

Provincial Sources

Bedrock Geology of Manitoba — **BEDROCK GEOLOGY**

The Manitoba geology map, made available by the Government of Manitoba, describes the bedrock and quaternary geology of the province, with accompanying geological maps and detailed descriptions of the geology in major mineral-producing areas.

Manitoba Detailed Soil Survey (DSS3) — **SOIL SURVEY**

Soil surveys have been published for most of the agricultural areas, and many surrounding areas, across Canada. Data from these surveys comprise the most detailed soil inventory information in the National Soil DataBase. Data is made available by Agriculture and Agri-Food Canada

Manitoba Oil and Gas Wells — **MOGW**

The Manitoba Oil and Gas Wells database was collected through the assistance of The Land Systems Company. Information is provided regarding license number and location for over 4,800 wells. Please note that this database will not be updated, information on wells drilled after May 2002 can be found in the Oil and Gas Wells (OGW) database under the `Private Source Database' section.

Surficial Geology of Manitoba — **SURFICIAL GEOLOGY**

This dataset, made available by the Government of Manitoba, contains information of surficial geological features in the province.

Water Well Inventory — **WWIS**

The GW Drill database compiled by the Manitoba Water Stewardship Division and Groundwater Management Program provides information on water wells across the province. The GW Drill database is a compilation of records from various sources and is intended to provide water well, stratigraphic, and hydrogeologic background information. The compilation is extensive but is not a comprehensive or

complete inventory of wells in the province. For many records, location has been provided in DLS (Dominion Land Survey) format and locations may be accurate to the section or quarter section only. Any analysis or interpretation of records or the absence thereof must take into consideration that the GW Drill database is not comprehensive and should not be used as an inventory.

Wetlands of Manitoba **WETLAND**

The Manitoba Wetland Inventory contains information on a classification of wetland coverage for Assiniboine River Valley, Southern Peatlands, and Whitewater. This database is made available by Manitoba Habitat Heritage Corporation.

Private Sources

Oil and Gas Wells **OGWW**

The Nickle's Energy Group (publisher of the Daily Oil Bulletin) collects information on drilling activity including operator and well statistics. The well information database includes name, location, class, status and depth. The main Nickle's database is updated on a daily basis, however, this database is updated on a monthly basis. More information is available at www.nickles.com.

Radon Zone Information **RADON**

The Radon Potential Map is developed by Radon Environmental Management Corporation. Its objective was to illustrate the relative variation of radon risk across the country, and in 2011 it published its first geologic Radon Potential Map of Canada.

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Appendix C

Chain of Title Documents

H.B.C Rly See ALSO Book H 40 - 258 151

HBC Rly & Man North Rly See ALSO Book 36 Folio 341 & 342

SECTION ~~A~~. TOWNSHIP 111 RANGE 20 E.P.M. See ALSO Churchill Book Folio 299

Plans 495, 496 + 437

	No. of Instrument	INSTRUMENT	ITS DATE	Date of Registry	GRANTOR	GRANTEE	Consideration	LAND AND REMARKS
Dep.	4728	Plan	11 Aug 1961	27 Dec. 1961	of Right of way for Water Pipe Line -	Bordered Red - ~~R.A. Vassil M.L.S.~~ A.F.H. Holmann M.L.S.	—	Part and other land. (Shown as Parcels 1 to 6 to facilitate Descriptions).
	19383	R.P. Appln		14 June 1960	H.M. The Queen (Can)	Applicant.	—	Portions for Rt of way & Station Grounds on plan 586 on part of twp 111.
Dep	4987	Plan	4 July 1963	28 Jany 1965	Fort Prince of Wales Historic Park -	Bordered Red - R.A. Vassil M.L.S.		Part West Peninsula Churchill Harbr
Dep	4988	Plan	6 July 1963	28 Jany 1965	Cape Merry Battery Historic Site -	Bordered Red - R.A. Vassil M.L.S.		Part East Peninsula Churchill Harbour
	20902	R.P. Appln		3 Apl 1968	H.M. The Queen (Canada)	Applicant	—	Lake Rosabelle.
	20916	R.P. appln		22 Apl 1968	H.M. The Queen (Canada)	applicant	—	Mines & Minerals under Water lots in Pl 437
	22138	R.P. appln.		18 May 1978	H.M. The Queen (Man).	applicant	—	Part for Plan No. 6424.
	6671	Plan	5 Oct. 78	9 Jan. 80	of Survey {Parcels A-H}	J.M. Stewart M.L.S.	~	Part and other land
	6672	Plan	5 Oct. 78	9 Jan 80	of Survey {Parcels A-D}	J.M. Stewart M.L.S.	~	Part
	22340	R.P. appln		9 Jan 1980	H.M. Queen (Man).	applicant	—	Part for Plan 6671
	22341	R.P. appln		9 Jan 1980	H.M. Queen (Man)	applicant	—	Part for Plan 6672.
	89-3193	R.P. App'n	4 Ap. 1989	23 May 1989	H.M. Queen (Manitoba)	Applicant	~	Part (All in plan 23833)
	40024	Plan	8 Aug 2001	31 May 2002	Easement	MTS Communications Inc.		11, 14, 23, 26 + 35 - 111 - 20E + other lands.
	1055257	Agreement	16 May 2002	31 May 2002	H.M.L (Man)	MTS Communications Inc.		Part for Plan 40024.
	40025	Plan	8 Aug 2001	31 May 2002	Easement	MTS Communications Inc.		2 + 11 - 111 - 20E + other lands
	1055260	Agreement	16 May 2002	31 May 2002	H.M.L (Man)	MTS Communications Inc.		Part for Plan 40025

SECTION TOWNSHIP 112 RANGE 20E con't

No. of Instrument	INSTRUMENT	ITS DATE	Date of Registry	GRANTOR	GRANTEE	Consideration	LAND AND REMARKS
40023	Plan	8 Aug 2001	31 May 2002	Easement	MTS Communications Inc.		11, 14 + 23 - 112 - 20E + other land.
1055255	Agreement	16 May 2002	31 May 2002	H.M. L (Man)	MTS Communications Inc.		Part for Plan 40023
40024	Plan	8 Aug 2001	31 May 2002	Easement	MTS Communications Inc.		2, 11 - 112 - 20E + other lands.
1055257	Agreement	16 May 2002	31 May 2002	H.M. L (Man)	MTS Communications Inc.		Part for Plan 40024.
43121	Plan	24 Mar 2004	29 Sept 2004	Survey	B. B. Balcken MLS.		pt. Sec 26 (pt Pcl E. Plan 40278 PLTO)
1078108	RP Appln	20 July 04	29 Sept 04	H.M. the Queen (Canada)		—	Part for Plan 43121
43631	PLAN	12 Dec 2004	7 Mar 2005	Easement for Utilities	- W.W. Shepherd MLS		part of Pcls. A & F. Plan 40278 in Sec 23 to 26
1084041	OSA	20 April 05	01 June 05	H. M. Queen Canada	MTS Allstream Inc		pt Pcl. G Plan 40278 for Plan 43631
1084042	OSA	20 April 05	01 June 05	H. M. Queen Canada	MTS Allstream Inc		pt. Pcl. F Plan 40278 for Plan 43631
1084043	OSA	20 April 05	01 June 05	H. M. Queen Canada	MTS Allstream Inc.		pt. Pcl A Plan 40278 for Plan 43631
1084044	OSA	2 May 05	01 June 05	H. M. Queen Canada	MTS Allstream Inc.		pt east of Plan 845 & N. of Plan 5329 for Plan 43631
1102408	OSOIC	8 Aug 1968	23 March 2007	H. M. Queen (Man)	Indian Affairs + Northern Dev. Canada.		Lot aside 800 feet perp south of Plan 4987 for enlargement Fort Prince of Wales Historic Site - No. 1104/68
1158410	R.P.A. Order in Council	25 Jan 2013	30 Jan 2013	H. M. the Queen (Man)	—	$100.00	all mines + minerals in Blk 31 Plan 844
OSOIC 1163873	857/52. Order in Council	7 June 1952.	9 Oct 2013.	H. M. the Queen (Man)	H. M. the Queen (Can)		Grant of land with right of reversion
OSOIC 1163874	489/12.	12 Dec 2012	9 Oct 2013	H. M. the Queen (~~Can~~ HB)	H. M. the Queen (~~Man~~) CAN	ACCEPTANCE	of Transfer of Admin + Control of Crown land in 1163874
OSOIC 1163874	Quit Claim	28 July 2011	9 Oct 2013	H. M. the Queen (~~Man~~) CANADA	H.M. THE QUEEN (MAN).	PART	of Lands in 1163874/3. - TRANSFER of ADMIN + CONTROL

Hudson Bay Railway — in —

unsurveyed Territory —

SECTION	TOWNSHIP	RANGE	Number of Instrument	INSTRUMENT	ITS DATE	DATE OF REGISTRY	GRANTOR	GRANTEE	Consideration	LAND AND REMARKS
Plan 578			11941	R. P. Apples		20 Jan 1931	His Majesty The King in right of Man	Applicant		Pt Mile 221-to-245.0. Plan 578 consisting 328.1 acres (Rt of Way)
579			—							Pt Miles 245.0 to 270.62 Plan 579. " 384.50 acres Ballast pits
575			—							Pt Miles 270.62-324.08 Plan 575 " 357.91 acres Rt of way etc
577			—							Pt Miles 324.08-414.29 Plan 577. " 4,607.55 acres Rt of way, etc
576			—							Pt Miles 414.0 to 465.0 Plan 576. " of 348.17 acres Rt of way etc.
			Re No 3186 & Rejection of R.P.A. 11941	Order in Council 1464/32	16th May 1932.		By His Majesty The King in right of Manitoba			Park Reserve & other land.
Registered —	Plan No 600.				19 Nov 1932.	20 May 1933.	showing Extra Land required for Station Grounds.	Applicant		
							Water Supplies, Dwelling Sites & Wye			

Tps 79-109, Range 6-22, E.P.M., = Miles 244.0, To Miles 497.0 Manitoba (Parcels 1 to 23, inclusive) as follows = Parcels 1 & 2 Station Grounds, Parcel 3 (Dwelling Sites) Parcel 4 (Water Supplies), Parcel 5 (Dwelling Sites), Parcel 6 (Dwelling Sites) Parcel 7 (Water Supplies) Parcel 8 (Dwelling Sites) Parcel 9 & 10 (Water Supplies), Parcel 11 (Dwelling Sites) Parcel 12 (Wye), Parcel 13 (Water Supplies). Parcel 14 Dwelling Sites Parcel 15 (Grounds) Parcel 16 (Dwelling Sites) Parcel 17 (Water Supplies) Parcel 18 (Water Supplies) Parcel 19 (Dwelling Sites) Parcel 20 (Water Supplies) Parcel 21 (Dwelling Sites), Parcel 22 (Dwelling Sites), Parcel 23 (Dwelling Sites).

			12657	R. P. Applin	~~Order in Council 830/33~~	~~29 July 1933~~	~~His Majesty The King (in Manitoba)~~	Applicant. See folio 254.		~~Pt Tract of 35 Range 18 East of E.P.M. at Mile 337.0 Hwy 10 (Dwelling Sites)~~
Plan No 600			~~12022~~	~~R. P. Applin.~~		1 Dec 1934	~~His Majesty the King. (in Manitoba)~~	Applicant. See folio 255.		~~Lots 5 & 6 from 12 acres to 1 acre Dwelling Sites 286 R.P.A. Shown indexed but not on plan 600~~
Plans 578, 579, 575, 577			19381	R P Applin	(1654.28 acres)	14 June 1960	Her Majesty the Queen (Canada)	Applicant from mile 221.49 to mile 323.9		Parts for Ry Rt of Way & Stn Grounds & Ballast Pits
Plans 577, 582, 583, 584			19382	R P Applin	(1789.70) acres	14 June 1960	Her Majesty the Queen (Canada)	Applicant from mile 323.9 to mile 414.4		Parts for Ry Rt of Way Stn Grounds Ballast Rt of Way
585, 576, 574, 586			19383	R P Applin	1293.77 acres	14 June 1960	Her Majesty the Queen (Canada)	Applicant from mile 414.4 to mile 537.78		Parts for Ry Rt of Way & Stn Grounds etc
Deposit			5509	Order in Council P.C. 1704/1933		8 Aug. 1962	Transferring from Dept of Interior (Canada)	To Dept. of Railways & Canals for H.B. Ry.		parcels on plan 600.

Manitoba Northern Railway Co — Unsurveyed

SECTION

Territory

TOWNSHIP

RANGE

	No. of Instrument	INSTRUMENT	ITS DATE	DATE OF REGISTRY	GRANTOR	GRANTEE	Consideration	LAND AND REMARKS
Plan 569	11774	R.P. Applcn		June 5 1930	Manitoba Northern Ry Co (appl)	Cold Lake Branch		Part
Plan 570	11775	R.P. Applcn		" " "	" " "	Hin Hon Branch		Part
Plan 571	11877	R.P. Applcn		Nov 15 1930	" " "	" " "		Part (Rt of way etc)
Plan 571	11878	R.P. Applcn		" " "	" " "	" " "		Part (Rt of way etc)
Plan 571	11879	R.P. Applcn		" " "	" " "	" " "		Part (Rt of way etc)
Plan 569	11880	R.P. Applcn		15 Nov 1930	Manitoba Northern Ry Co (Applicant)	Cold Lake Branch	—	Part for Rt of way
[illegible]	11881	R.P. Applcn		15 Nov 1930	Manitoba Northern Ry Co (Applicant)			Part (Ballast Pit Spur) Stokers Grounds
Deposit No	25544	Plan	15 Dec 1930	30 Dec 1930	M.N. Ry Co Plan showing land required			Part (Ballast Pit Spur) Twp 58 Ranges 26 & 27 W
	14982.	R.P. Applcn		11 Aug 1972	Manitoba Northern Rly Co.	for Ballast Pit Spur Hin Hon Branch (	—	Part (Ballast Pit Spur in Twp 58, Ranges 26 & 27 W)
								Part (extra Rgt Way)

see also Special Survey Plan 823, 824 - 825 - 826 & 827

Unsurveyed Territory
Hudson's Bay Railway
~~SECTION~~

See also opened Twps in loose leaf.

	No. of Instrument	INSTRUMENT	ITS DATE	DATE OF REGISTRY	GRANTOR
Deposit	No 2571	Plan	2 Feb 1931	7 Mch 1931	Land required for Ballast Pit
"	" 2572	Plan	30 Jan 1931	7 Mch 1931	Land required for Ballast Pit & Spur
"	" 2573	Plan	2 Feb 1931	7 Mch 1931	Land required for Ballast Pit & Spur
Registered	600	Plan	19 Nov 1932	20 May 1933	Showing Extra Land required for Station Grounds, Water Supplies, Dwelling Sites & Wye
	Parcels 1 & 2 (Station Grounds). Parcel 3 (Dwelling Site) Parcel 4 (Water Supply). Parcel 5 (Dwelling Site) Parcel 6 (Dwelling Site) Parcel 7 (Water Supply) Parcel 15 (Dwelling Site) Parcel 16 (Dwelling Site) Parcel 17 (Water Supply) Parcel 18 (Water Supply) Parcel 19 (Dwelling Site) Parcel 20 (Water Supply)				
	12657	R. P. Apple Pt. Order-in-Council P.C. 93	29 July 1933		His Majesty the King (in Manitoba)
Deposit	No 3072.	PLAN. Hudson Bay Ry.	20 Nov 1935	24 Feby 1936	Showing Extra Land required for Water Supply
Deposit	5509	P.C. Order 1704	22 Aug. 1933	8 Aug 1962	Transferring from Dept. of Interior (Canada) to
Plans 578	19381	R Pattler	Part of Unsurveyed area taken for Hudson Bay Railway	14 June 1960	Her Majesty the Queen Canada
579	19381	R Pattler			
575	19381	R Pattler			
581	19381	R Pattler			
Plans 577	19382	R Pattler	for Parts of H B Ry	14 June 1960	Her Majesty the Queen (Canada)
582	19382	R Pattler			
583	19382	R Pattler			
584	19382	R Pattler			
Plans 585	19383	R Pattler	for H B Ry	14 June 1960	Her Majesty the Queen (Canada)
576	19383	R Pattler			
574	19383	R Pattler			
586	19383	R Pattler			

TOWNSHIP	RANGE	GRANTEE	Consideration	LAND AND REMARKS
(Twp 94, Rge 21 E.P.M.)	Mile 394.70 to Mile 396.59 Manitoba ✓			
(Twp 112, Rges 20 & 21 E.P.M.)	Mile 507.21 Manitoba - See also Extract - loose leaf.			
Twps 105 & 106 Rges 20 & 21 E.P.M. & 1. E. 2nd M.E.	Mile 467.32 Manitoba ✓			
Twps 79-109, Rges 6-22 E.P.M.	Mile 240.02 to Mile 497.0 Manitoba (Parcels 1-to 23-inclusive) as follows Parcel 8 (Dwelling Site) Parcel 9 & 10 (Water Supply) Parcel 11 (Dwelling Site) Parcel 12 (Wye) Parcel 13 (Water Supply). Parcel 14 (Dwelling Site.) Parcel 21 (Dwelling Site) Parcel 22 (Dwelling Site) Parcel 23 (Dwelling Site)			
Twp. 85 - Range 18 - East P.M.	Mile 327 - Gillam Townsite -			
Twp 107, Range 20 E.P.M. (shown as Name Point).	Mile 474.3 Manitoba Correcting Plan No 600. (Area Parcel 20 = 17.97 acres (Water Supply)			
Dept. of Railways & Canals (Canada)	~ Parcels 1 & 23, Plan 600.			
		Applicants	Parts for R of W Stn Grounds Ballast Pit for H B Ry	
		applicant	Parts for R of W Stn Grounds Wye & Ballast Pit	
		applicant	Parts for R of W & Stn Grounds	

QUARTER OF SECTION

BLOCK 595

	BOOK	No. of Instrument	INSTRUMENT	ITS DATE	DATE OF REGISTRY	GRANTOR
LOT. 1		Deposit no 2081	Plan	11 Aug 1927	15 Aug 1927	Expropriated by the King
LOT. 2						
LOT. 3						
LOT. 4						
LOT. 5						
LOT. 6						
LOT. 7						
LOT. 8		Deposit no 2081	Plan	11 Aug. 1927	15 Aug 1927	Expropriated by the King
LOT. 9		Deposit no 2081	Plan			
LOT. 10		Deposit no 2081	Plan			
LOT. 11		Deposit no 2081	Plan			
LOT. 12		Deposit no 2081	Plan			
LOT. 13		Deposit no 2081	Plan			
LOT. 14		Deposit no 2081	Plan			
LOT. 15		Deposit no 2081	Plan			
LOT. 16		Deposit no 2081	Plan			
LOT. 17		Deposit no 2081	Plan			
LOT. 18		Deposit no 2081	Plan			
LOT. 19		Deposit no 2081	Plan			
LOT. 20		Deposit no 2081	Plan			

PLANS 495, 496 & 437
~~TOWNSHIP~~ CHURCHILL ~~RANGE~~

GRANTEE	~~CONSIDERATION~~ Nom fee	INST.	DATE OF REGISTRY	~~LAND AND REMARKS~~	LAND
All of the Lots, entire Blocks, Streets Avenues and lanes contained within a Plan of the Battery Park Subdivision a Plan of South Part of the Battery Park Subdivision and a plan of Subdivision from Seventeenth Avenue to thirty-seventh Avenue each covering a portion of the East Peninsula of Churchill Harbour or Hudson's Bay Respectively approved and confirmed on the twelfth day of January ~~on the twelfth day of January 1916~~ 1916 and on the tenth day of September 1909 by Edouard Deville Surveyor General of Dominion Lands and of record in the Department of the Interior	7912	R.P. Applbn	5 Sept 1917	The King	All

Deposit 2680 Plan 13 Nov 1931 – 17 Dec 1931 – of Parcel of Land at Churchill – from between 17th Avenue & Thirtieth Ave. bounded with Pink line East Peninsula All of Plan 2680.

12 336 R. P. Applbn + Order in Council 650/32, Registered 28 May 1932 His Majesty the King (appellant) v

Deposit 2769 Plan 4 Oct 1933 – June 1933 – Land required for R.R. Way for Life Line through Part A & B. Churchill (coloured Pink).

Deposit 4988 Plan 4 July 1963 – 28 Jany 1965 Expe. Merry Battery Historic Site East Peninsula – Churchill – Bordered Red.

20902 R. P. Applbn. rejd 3 Apl 1968 H.M. the Queen (Can), Applicant – Lake Rendall

Dep 2081 Plan 11 Aug 1927 – 15 Aug 1927 Expropriation by the King.

20916 – R.P. Applbn. rejd 22 Apl 1968 H.M. the Queen (Can) applicant mines & Materials under Outlots in Plan 437

R 2862 – Request to Remove Caveats 28 Jany 1976 – 7 Apl 1976 Registered 77 the Queen – Canada – Romanne Masala Dep 2081
Lic. 2 Lic. 2 Regs 112 Regs 20 + 21 L.R.M.

Appendix D

Aerial Photographs

PHASE I/II ESA
Former Sayisi Dene Village
Churchill, Manitoba

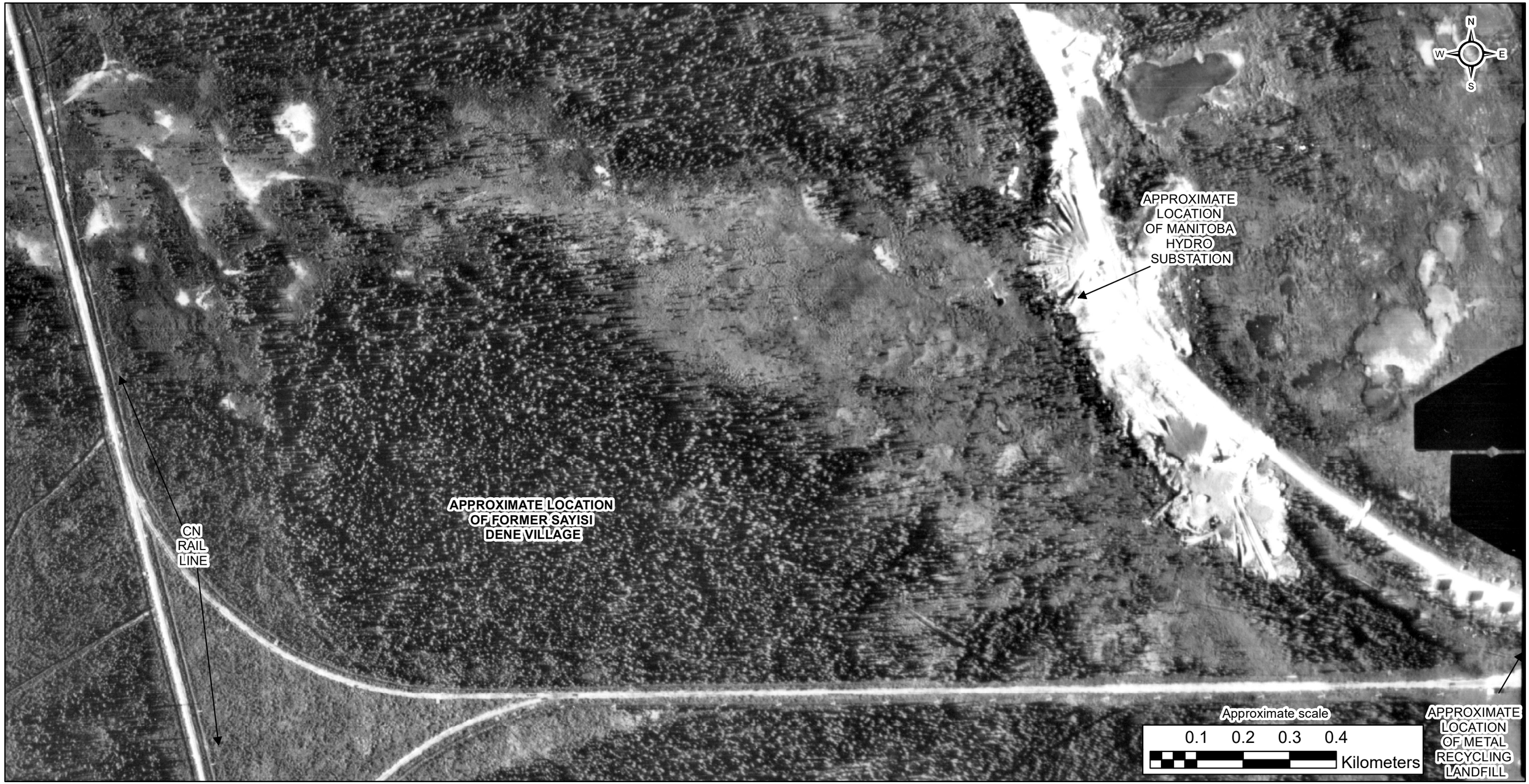
AERIAL PHOTOGRAPH - 1947

DILLON CONSULTING

MAP CREATED BY: AAM
MAP CHECKED BY: NLB
MAP PROJECTION: NAD 1983 UTM Zone 15N

FILE LOCATION: \\DILLON.CA\DILLON_DFS\LONDON\LONDON CAD\GIS\
VISUAL COMMUNICATIONS D\MXD TEMPLATES\
BLUE - 11X17 LANDSCAPE - LEGEND BOTTOM.MXD

PROJECT: 19-1615 STATUS: DRAFT DATE: November 2019



PHASE I/II ESA
Former Sayisi Dene Village
Churchill, Manitoba

AERIAL PHOTOGRAPH - 1956

DILLON CONSULTING

MAP CREATED BY: AAM
MAP CHECKED BY: NLB
MAP PROJECTION: NAD 1983 UTM Zone 15N

FILE LOCATION: \\DILLON.CA\DILLON_DFS\LONDON\LONDON CAD\GIS\
VISUAL COMMUNICATIONS D\MXD TEMPLATES\
BLUE - 11X17 LANDSCAPE - LEGEND BOTTOM.MXD

PROJECT: 19-1615 STATUS: DRAFT DATE: November 2019

PHASE I/II ESA
Former Sayisi Dene Village
Churchill, Manitoba

AERIAL PHOTOGRAPH - 1959

DILLON CONSULTING

MAP CREATED BY: AAM
MAP CHECKED BY: NLB
MAP PROJECTION: NAD 1983 UTM Zone 15N

FILE LOCATION: \\DILLON.CA\DILLON_DFS\LONDON\LONDON CAD\GIS\
VISUAL COMMUNICATIONS D\MXD TEMPLATES\
BLUE - 11X17 LANDSCAPE - LEGEND BOTTOM.MXD

PROJECT: 19-1615 STATUS: DRAFT DATE: November 2019

PHASE I/II ESA
Former Sayisi Dene Village
Churchill, Manitoba

AERIAL PHOTOGRAPH - 1977

DILLON CONSULTING

MAP CREATED BY: AAM
MAP CHECKED BY: NLB
MAP PROJECTION: NAD 1983 UTM Zone 15N

FILE LOCATION: \\DILLON.CA\DILLON_DFS\LONDON\LONDON CAD\GIS\VISUAL COMMUNICATIONS D\MXD TEMPLATES\BLUE - 11X17 LANDSCAPE - LEGEND BOTTOM.MXD

PROJECT: 19-1615 STATUS: DRAFT DATE: November 2019

PHASE I/II ESA
Former Sayisi Dene Village
Churchill, Manitoba

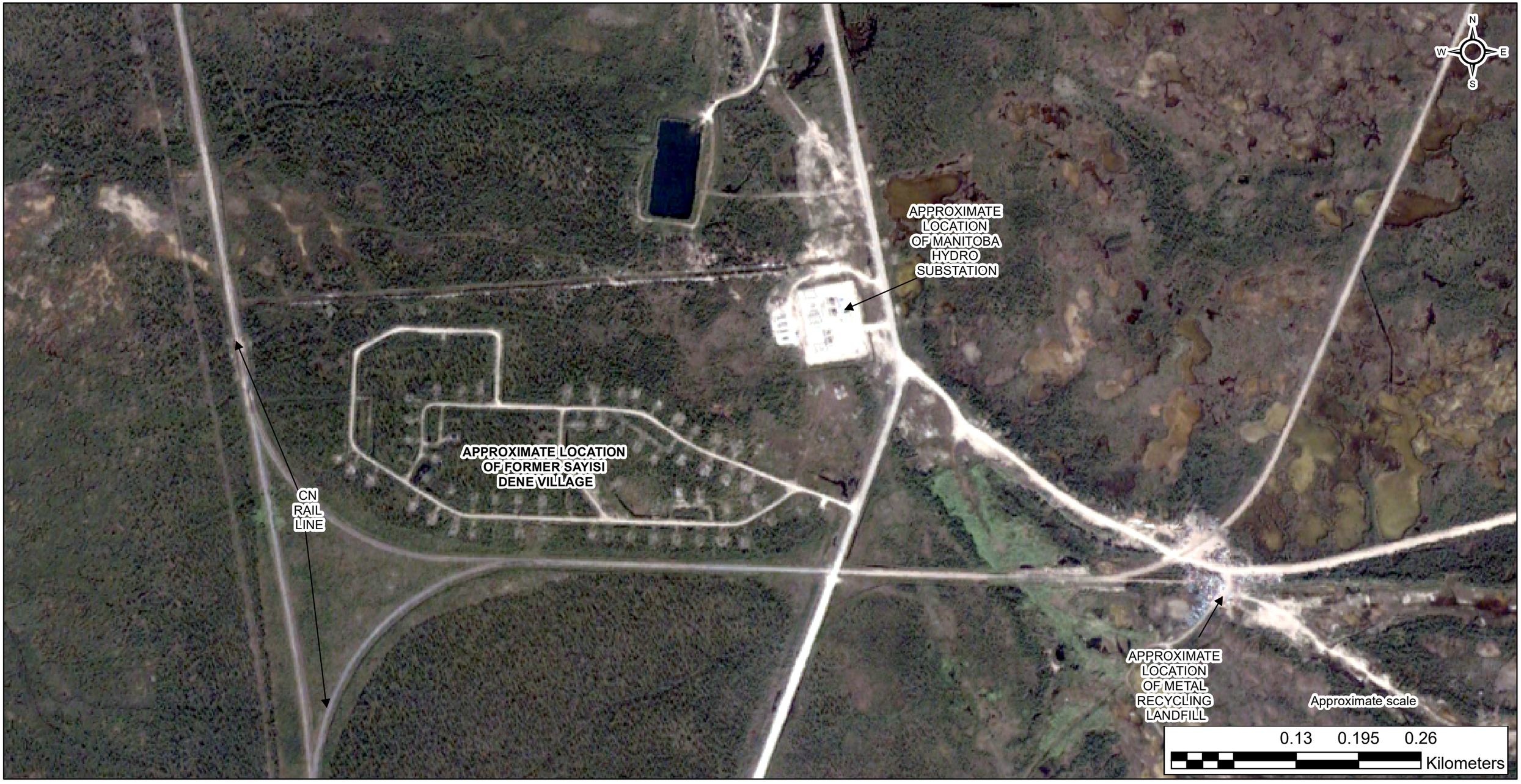
AERIAL PHOTOGRAPH - 1986

DILLON CONSULTING

MAP CREATED BY: AAM
MAP CHECKED BY: NLB
MAP PROJECTION: NAD 1983 UTM Zone 15N

FILE LOCATION: \\DILLON.CA\DILLON_DFS\LONDON\LONDON CAD\GIS\
VISUAL COMMUNICATIONS D\MXD TEMPLATES\
BLUE - 11X17 LANDSCAPE - LEGEND BOTTOM.MXD

PROJECT: 19-1615 STATUS: DRAFT DATE: November 2019



PHASE I/II ESA
Former Sayisi Dene Village
Churchill, Manitoba

AERIAL PHOTOGRAPH - 2003

DILLON CONSULTING

MAP CREATED BY: AAM
MAP CHECKED BY: NLB
MAP PROJECTION: NAD 1983 UTM Zone 15N

FILE LOCATION: \\DILLON.CA\DILLON_DFS\LONDON\LONDON CAD\GIS\
VISUAL COMMUNICATIONS D\MXD TEMPLATES\
BLUE - 11X17 LANDSCAPE - LEGEND BOTTOM.MXD

PROJECT: 19-1615 STATUS: DRAFT DATE: November 2019

PHASE I/II ESA
Former Sayisi Dene Village
Churchill, Manitoba

AERIAL PHOTOGRAPH - 2014

DILLON CONSULTING

MAP CREATED BY: AAM
MAP CHECKED BY: NLB
MAP PROJECTION: NAD 1983 UTM Zone 15N

FILE LOCATION: \\DILLON.CA\DILLON_DFS\LONDON\LONDON CAD\GIS\
VISUAL COMMUNICATIONS D\MXD TEMPLATES\
BLUE - 11X17 LANDSCAPE - LEGEND BOTTOM.MXD

PROJECT: 19-1615 STATUS: DRAFT DATE: November 2019

PHASE I/II ESA
Former Sayisi Dene Village
Churchill, Manitoba

AERIAL PHOTOGRAPH - 2019

DILLON CONSULTING

MAP CREATED BY: AAM
MAP CHECKED BY: NLB
MAP PROJECTION: NAD 1983 UTM Zone 15N

FILE LOCATION: \\DILLON.CA\DILLON_DFS\LONDON\LONDON CAD\GIS\
VISUAL COMMUNICATIONS D\MXD TEMPLATES\
BLUE - 11X17 LANDSCAPE - LEGEND BOTTOM.MXD

PROJECT: 19-1615 STATUS: DRAFT DATE: November 2019

Appendix E

Historical Reports

Appendix F

Manitoba Sustainable Development Search

Manitoba
Conservation and Climate
Environmental Compliance & Enforcement
27 2nd Avenue SW, Box 10
Dauphin, Manitoba R7N 3E5
T 204-622-2030 F 204-638-8626
www.manitoba.ca

November 21, 2019
File #: 3784
Client File #:

Nanci Beaupre
Dillon Consulting Ltd.
1558 Willson Place
Winnipeg, MB R3T 0Y4

Dear Nanci Beaupre:

Re: Parcel A, Plan 39799, Churchill

Your request to conduct an Environmental File Search of the property listed above has been completed. The attached Environmental Stewardship Response summarizes the information found in the current records maintained by the Department of Conservation & Climate.

Should you have questions regarding the information presented on the attached file search response, ***please contact the Environment Officer listed on the response form (page 2)***.

Should you require additional information ***regarding a confirmed contaminated or impacted site*** we have on file, please contact Warren Rospad, Contaminated Sites Coordinator/Environment Officer, at 204-330-2685 or Warren.Rospad@gov.mb.ca.

Yours truly,

Tammy Wruth
Administrative Assistant

Attached: Environmental Stewardship File Search Response
(GST registration # R107863847)

ENVIRONMENTAL STEWARDSHIP DIVISION FILE SEARCH RESPONSE

Manitoba Conservation and Climate

Date Received	08/Nov/2019	File Search #	3784
Business/Tenant	Sweat Lodge & Dog Sledding Business		
Property	Parcel A, Plan 39799, Churchill		
Search Requested by	Nanci Beaupre	Company:	Dillon Consulting Ltd.
Environment Officer	Prasid Bhattarai	**EO Phone #**	204-307-5350
Date Completed	18/11/2019		

Program	File	Status	Licence / Permit/Operation ID/ Operation Name
Environment Act Licence or Permit	○ Yes ◉ No	○ Operating ○ Inactive ○ Decommissioned	
DGHT Act Licence or Permit	○ Yes ◉ No	○ Operating ○ Inactive ○ Decommissioned	
Registered Hazardous Waste Generator	○ Yes ◉ No	○ Operating ○ Inactive ○ Decommissioned	
Registered Petroleum Storage Site	○ Yes ◉ No	○ Operating ○ Inactive ○ Decommissioned	
Permitted/Registered Manure Storage Facility or Confined Livestock Area	○ Yes ◉ No	○ Operating ○ Inactive ○ Decommissioned	
Contaminated/Impacted Site	○ Yes ◉ No	○ Not Designated ○ Designated Contaminated ○ Designated Impacted	The Contaminated/Impacted Site Program does not have a file on the site. This site is not a designated contaminated or impacted site pursuant to The Contaminated Sites Remediation Act
Orders (Environmental Protection Order, Emergency Action Notice, Director's Order, or Environment Officer Order)	○ Yes ◉ No		
Additional Comments			

This report summarizes the information found in current electronic records maintained by the Department and is for informational purposes only. No representation or responsibility is assumed whatsoever as to the completeness of this information as it relates to the environmental condition or prior incidents associated with the property in question. In order to obtain more complete information on the property, persons may wish to retain the services of a qualified consultant for the purposes of conducting an environmental audit.

Appendix G

ERIS Report

ENVIRONMENTAL RISK INFORMATION SERVICES

DATABASE REPORT

Project Property:	*Churchill Dene PH 1* *MK0500-85-02* *Churchill MB*
Project No:	*MK0500-85-02*
Report Type:	*Quote - Custom-Build Your Own Report*
Order No:	*20190924107*
Requested by:	*Dillon Consulting Limited*
Date Completed:	*September 25, 2019*

Environmental Risk Information Services
A division of Glacier Media Inc.
1.866.517.5204 | info@erisinfo.com | erisinfo.com

Table of Contents

Executive Summary

Property Information:

Project Property:	*Churchill Dene PH 1* *MK0500-85-02 Churchill MB*
Project No:	*MK0500-85-02*

Order Information:

Order No:	*20190924107*
Date Requested:	*September 24, 2019*
Requested by:	*Dillon Consulting Limited*
Report Type:	*Quote - Custom-Build Your Own Report*

Historical/Products:

Land Title Search	*Historical Land Title Search*
Physical Setting Report (PSR)	*PSR*

Executive Summary: Report Summary

Database	Name	Searched	Project Property	Boundary to 0.25km	Total
AUWR	Automobile Wrecking & Supplies	Y	0	0	0
CA	Certificates of Approval	Y	0	0	0
CDRY	Dry Cleaning Facilities	Y	0	0	0
CHEM	Chemical Register	Y	0	0	0
CNG	Compressed Natural Gas Stations	Y	0	0	0
CONV	Enforcement Actions	Y	0	0	0
CS	Contaminated/Impacted Sites	Y	0	0	0
DRL	Drill Holes	Y	0	0	0
EEM	Environmental Effects Monitoring	Y	0	0	0
EHS	ERIS Historical Searches	Y	0	0	0
EIIS	Environmental Issues Inventory System	Y	0	0	0
FCON	Federal Convictions	Y	0	0	0
FCS	Contaminated Sites on Federal Land	Y	0	0	0
FST	Fuel Storage Tanks	Y	0	0	0
FUEL	Bulk Fuel Distributors	Y	0	0	0
GEN	Waste Generators Summary	Y	0	0	0
GHG	Greenhouse Gas Emissions from Large Facilities	Y	0	0	0
IAFT	Indian & Northern Affairs Fuel Tanks	Y	0	0	0
MAST	Manure Storage Facilities	Y	0	0	0
MINE	Canadian Mine Locations	Y	0	0	0
MNR	Mineral Occurrences	Y	0	0	0
MOGW	Manitoba Oil and Gas Wells	Y	0	0	0
NATE	National Analysis of Trends in Emergencies System (NATES)	Y	0	0	0
NDFT	National Defense & Canadian Forces Fuel Tanks	Y	0	0	0
NDSP	National Defense & Canadian Forces Spills	Y	0	0	0
NDWD	National Defence & Canadian Forces Waste Disposal Sites	Y	0	0	0
NEBI	National Energy Board Pipeline Incidents	Y	0	0	0
NEBP	National Energy Board Wells	Y	0	0	0
NEES	National Environmental Emergencies System (NEES)	Y	0	0	0
NPCB	National PCB Inventory	Y	0	0	0
NPRI	National Pollutant Release Inventory	Y	0	0	0
OGWW	Oil and Gas Wells	Y	0	0	0
PAP	Canadian Pulp and Paper	Y	0	0	0
PCB	Inventory of PCB Storage Sites	Y	0	0	0
PCFT	Parks Canada Fuel Storage Tanks	Y	0	0	0
PITS	Manitoba Pits and Quarries	Y	0	0	0

Database	Name	Searched	Project Property	Boundary to 0.25km	Total
PUBLIC REGISTRY	***Sustainable Development Public Registry***	*Y*	*0*	*0*	*0*
REC	***Waste Receivers Summary***	*Y*	*0*	*0*	*0*
RST	***Retail Fuel Storage Tanks***	*Y*	*0*	*0*	*0*
SCT	***Scott's Manufacturing Directory***	*Y*	*0*	*0*	*0*
SPL	***Manitoba Spills***	*Y*	*0*	*0*	*0*
TCFT	***Transport Canada Fuel Storage Tanks***	*Y*	*0*	*0*	*0*
WDS	***Waste Disposal Site Inventory***	*Y*	*0*	*0*	*0*
WWIS	***Water Well Inventory***	*Y*	*0*	*0*	*0*
		Total:	*0*	*0*	*0*

Executive Summary: Site Report Summary - Project Property

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev diff (m)	Page Number

No records found in the selected databases for the project property.

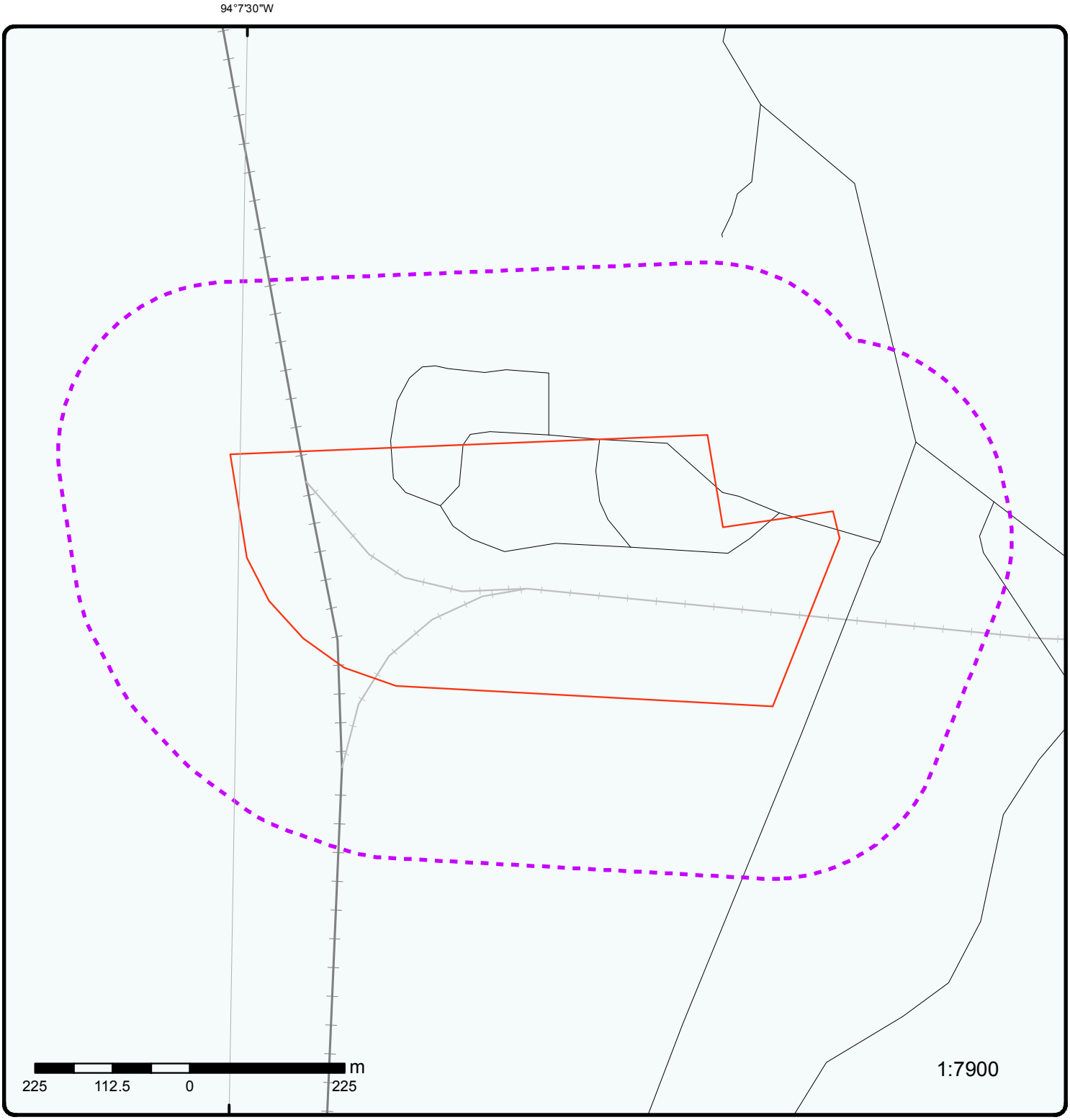
Executive Summary: Site Report Summary - Surrounding Properties

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number

No records found in the selected databases for the surrounding properties.

Executive Summary: Summary By Data Source

No records found in the selected databases for the project property or surrounding properties.



Map : 0.25 Kilometer Radius

Order No: 20190924107

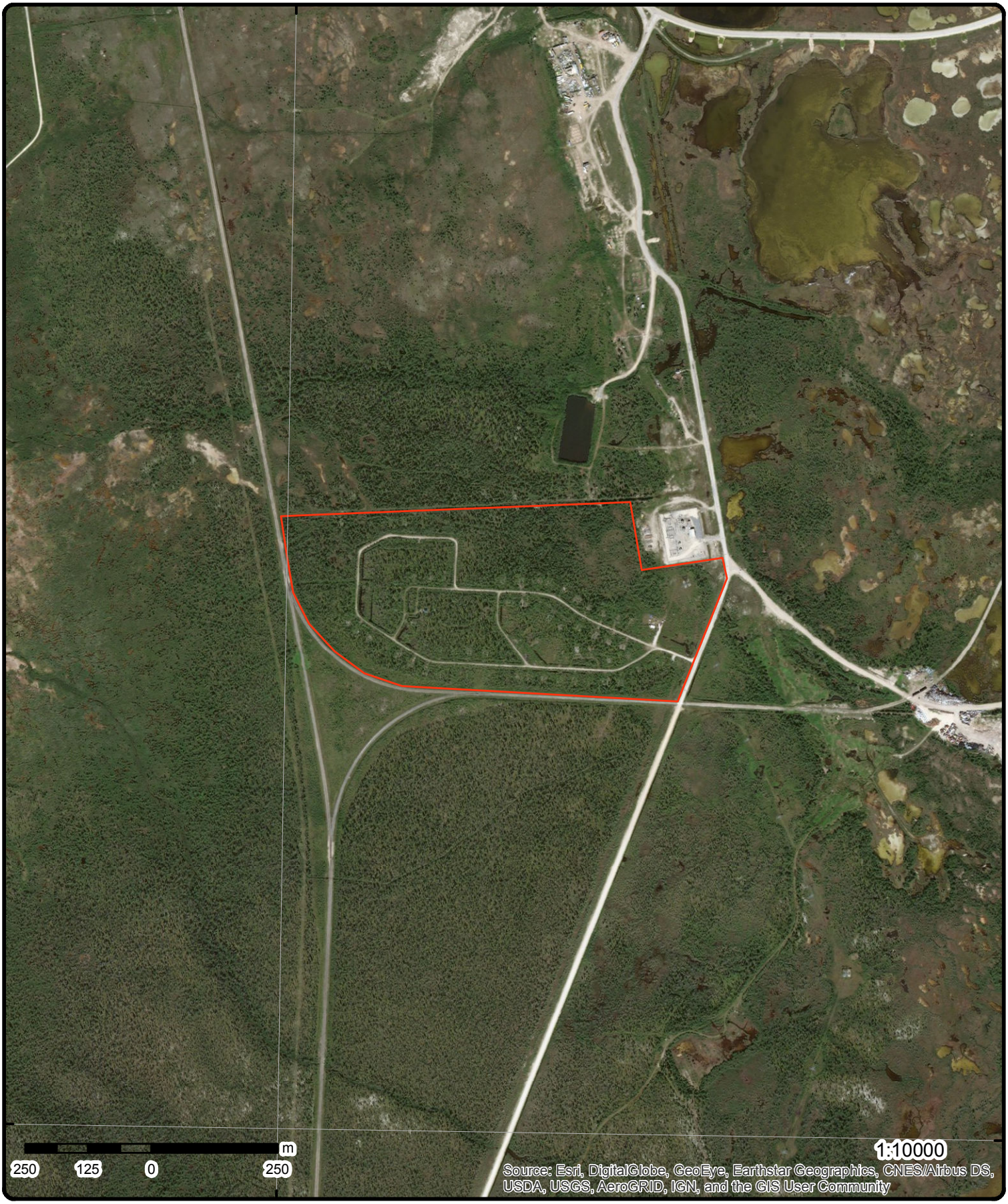
Address: MK0500-85-02, Churchill, MB

ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- Expressway
- Principal Highway
- Secondary Highway
- Major Road
- Local road
- Trail
- Proposed Road
- Ferry Route/Ice Road
- Industrial and Resource - Regions
- Main Line
- Sidetrack
- Transit Line
- Abandoned Line
- National Park
- Provincial or Territorial Park
- Other Park
- Golf Course or Driving Range
- Park or Sports Field
- Other Recreation Area

Source: © 2015 DMTI Spatial Inc.

94°7'30"W



Aerial (2016)

Address: MK0500-85-02, Churchill, MB

Source: ESRI World Imagery

Order No: 20190924107

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Map

Order No: 20190924107

Address: MK0500-85-02, Churchill, MB

Source: ESRI World Topographic Map

Detail Report

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

No records found in the selected databases for the project property or surrounding properties.

Unplottable Summary

Total: 4 Unplottable sites

DB	Company Name/Site Name	Address	City	Postal
FST	Hudson Bay Railway	Mile 510	Churchill MB	
GEN	CANADIAN NATIONAL RAILWAYS	MILE 5100	Churchill MB	
GEN	CANADIAN NATIONAL RAILWAYS	MILE 5100	Churchill MB	
GEN	CANADIAN NATIONAL RAILWAY (CHURCHILL)		CHURCHILL MB	

Unplottable Report

Site: ***Hudson Bay Railway***
Mile 510 Churchill MB

Database: ***FST***

Site ID:	13939	***Owner Category:***	Independent
Owner:	Hudson Bay Railway	***Site Status:***	Dismantled
Operator:		***Outlet Type:***	Fleet
Mailing City:	Churchill MB	***Inventory:***	Weekly
Mailing Address:	General Delivery		

--Details--

Status:	Installed	***NO Of Tanks:***	2
Position:	Aboveground	***Status Date:***	01-Jan-73
Spill Protect:	Unprotected	***Capacity(L):***	70460.00
Status:	Installed	***NO Of Tanks:***	1
Position:	Overhead	***Status Date:***	01-Jan-76
Spill Protect:	Unprotected	***Capacity(L):***	22730.00
Status:	Removed	***NO Of Tanks:***	2
Position:	Aboveground	***Status Date:***	19-Jul-00
Spill Protect:	Unprotected	***Capacity(L):***	70460.00
Status:	Removed	***NO Of Tanks:***	1
Position:	Overhead	***Status Date:***	19-Jul-00
Spill Protect:	Unprotected	***Capacity(L):***	22730.00

Site: ***CANADIAN NATIONAL RAILWAYS***
MILE 5100 Churchill MB

Database: ***GEN***

Registration No: MBG03212
SIC:
DLS:

Site: ***CANADIAN NATIONAL RAILWAYS***
MILE 5100 Churchill MB

Database: ***GEN***

Registration No: MBG03212
SIC:
DLS:

Site: ***CANADIAN NATIONAL RAILWAY (CHURCHILL)***
CHURCHILL MB

Database: ***GEN***

Registration No: MBG003212
SIC:
DLS:

Appendix: Database Descriptions

Environmental Risk Information Services (ERIS) can search the following databases. The extent of historical information varies with each database and current information is determined by what is publicly available to ERIS at the time of update. ***Note:*** *Databases denoted with " * " indicates that the database will no longer be updated. See the individual database description for more information.*

Automobile Wrecking & Supplies: Private AUWR

This database provides an inventory of known locations that are involved in the scrap metal, automobile wrecking/recycling, and automobile parts & supplies industry. Information is provided on the company name, location and business type.

Government Publication Date: 1999-Jul 31, 2019

Certificates of Approval: Provincial CA

This database contains approvals issued since July 1988 within the following categories: Approvals for Air or Effluent and Orders, Permits and/or Regulated Sites designations for Air, Effluent, Refuse or Storage. The information available within this database pertains to client information, general location, class type, operation type, license # and the issue date of the CA. Please note that no specific site address information is available.

Government Publication Date: 1988-Jun 2013*

Dry Cleaning Facilities: Federal CDRY

List of dry cleaning facilities made available by Environment and Climate Change Canada. Environment and Climate Change Canada's Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations (SOR/2003-79) are intended to reduce releases of tetrachloroethylene to the environment from dry cleaning facilities.

Government Publication Date: Jan 2004-Dec 2017

Chemical Register: Private CHEM

The Manitoba Industry, Trade and Tourism department maintains a chemical register of all known 'active' manufacturers of chemicals, fertilizers and pesticides within the province. Inactive chemical manufacturers are not required to remain in the database. Information available within this register pertains to company name, location and the 'product line'. Information from a private source regarding the locations of chemical manufacturers and distributors is also included in this database.

Government Publication Date: 1999-Jul 31, 2019

Compressed Natural Gas Stations: Private CNG

Canada has a network of public access compressed natural gas (CNG) refuelling stations. These stations dispense natural gas in compressed form at 3,000 pounds per square inch (psi), the pressure which is allowed within the current Canadian codes and standards. The majority of natural gas refuelling is located at existing retail gasoline that have a separate refuelling island for natural gas. This list of stations is made available by the Canadian Natural Gas Vehicle Alliance.

Government Publication Date: Dec 2012 - Jun 2019

Enforcement Actions: Provincial CONV

This database summarizes enforcement activities (Convictions, Warnings, Director's Order's, EO Order's, MOH Order's, Offence Notice's, and Permit Suspensions) where companies/individual have been found guilty of environmental offenses under Manitoba's Environmental Protection Legislation. Please note that enforcement actions resulting from activities regulated under the Livestock Manure & Mortalities Mgmt Regulation MR 42/98 are also included.

Government Publication Date: Apr 1994-Jul 2019

Contaminated/Impacted Sites: Provincial CS

List of sites registered under the Contaminated/Impacted Sites Program, made available by Manitoba Sustainable Development, Environmental Programs and Strategies branch. Includes sites that are on the Designated Impacted and Designated Contaminated Sites lists, as well as sites where impacts do not pose a concern, remediation has been completed, or further action is necessary.

Government Publication Date: Up to May 2019

Drill Holes: Provincial DRL

The "Open File Drill Holes" database contains information on more than 10,000 drill holes in the province of Manitoba. The database provides information in regard to drill hole location (place, latitude and longitude), depth and overburden of hole, exploration company and assessment report year.

Government Publication Date: Oct 31, 2018

Environmental Effects Monitoring: Federal EEM

The Environmental Effects Monitoring program assesses the effects of effluent from industrial or other sources on fish, fish habitat and human usage of fisheries resources. Since 1992, pulp and paper mills have been required to conduct EEM studies under the Pulp and Paper Effluent Regulations. This database provides information on the mill name, geographical location and sub-lethal toxicity data.

Government Publication Date: 1992-2007*

ERIS Historical Searches: Private EHS

ERIS has compiled a database of all environmental risk reports completed since March 1999. Available fields for this database include: site location, date of report, type of report, and search radius. As per all other databases, the ERIS database can be referenced on both the map and "Statistical Profile" page.

Government Publication Date: 1999-Jul 31, 2019

Environmental Issues Inventory System: Federal EIIS

The Environmental Issues Inventory System was developed through the implementation of the Environmental Issues and Remediation Plan. This plan was established to determine the location and severity of contaminated sites on inhabited First Nation reserves, and where necessary, to remediate those that posed a risk to health and safety; and to prevent future environmental problems. The EIIS provides information on the reserve under investigation, inventory number, name of site, environmental issue, site action (Remediation, Site Assessment), and date investigation completed.

Government Publication Date: 1992-2001*

Federal Convictions: Federal FCON

Environment Canada maintains a database referred to as the "Environmental Registry" that details prosecutions under the Canadian Environmental Protection Act (CEPA) and the Fisheries Act (FA). Information is provided on the company name, location, charge date, offence and penalty.

Government Publication Date: 1988-Jun 2007*

Contaminated Sites on Federal Land: Federal FCS

The Federal Contaminated Sites Inventory includes information on known federal contaminated sites under the custodianship of departments, agencies and consolidated Crown corporations as well as those that are being or have been investigated to determine whether they have contamination arising from past use that could pose a risk to human health or the environment. The inventory also includes non-federal contaminated sites for which the Government of Canada has accepted some or all financial responsibility. It does not include sites where contamination has been caused by, and which are under the control of, enterprise Crown corporations, private individuals, firms or other levels of government.

Government Publication Date: Jun 2000-May 2019

Fuel Storage Tanks: Provincial FST

The Petroleum Storage Tank database, which is maintained by Manitoba's Petroleum Storage Program, contains information in regard to company name, location, status, outlet type (retail, used oil, bulk/used'), number of tanks, tank capacity and tank status. This database will not be updated as this information is no longer collected in this format. For current information regarding bulk fuel distributors, please see the FUEL database.

Government Publication Date: 1905-Feb 2003*

Bulk Fuel Distributors: Provincial FUEL

The Manitoba Petroleum Storage Program maintains an inventory of Bulk Fuel Distributors. This inventory contains valid operating permit numbers within the Province of Manitoba. Fields such as name, location, expiry date, type of facility and permit Number are included.

Government Publication Date: 2006-May 2019

Waste Generators Summary: Provincial GEN

Within Manitoba, a waste generator is defined as any site, equipment and/or operation involved in the production, collection, handling and/or storage of regulated wastes. A generator of regulated waste is required to register the waste generation site and each waste produced, collected, handled or stored at the site. This database contains the licensing/registration number (MB1 #), company name and address of registered generators. At present, access to the type of hazardous waste generated and the form of treatment used in the handling of the waste is only available by directly calling Manitoba's Hazardous Waste Program.

Government Publication Date: 1998 - Mar 2019

Greenhouse Gas Emissions from Large Facilities: Federal GHG

List of greenhouse gas emissions from large facilities made available by Environment Canada. Greenhouse gas emissions in kilotonnes of carbon dioxide equivalents (kt CO2 eq).

Government Publication Date: 2013-Dec 2017

Indian & Northern Affairs Fuel Tanks: Federal IAFT

The Department of Indian & Northern Affairs Canada (INAC) maintains an inventory of aboveground & underground fuel storage tanks located on both federal and crown land. Our inventory provides information on the reserve name, location, facility type, site/facility name, tank type, material & ID number, tank contents & capacity, and date of tank installation.

Government Publication Date: 1950-Aug 2003*

Manure Storage Facilities: Provincial MAST

Under the Livestock Manure and Mortalities Management Regulation (MR 42/98), permits are issued for the construction, modification or expansion of manure storage facilities. Once issued, the Environmental Livestock Program is responsible for the enforcement of regulations on the management of manure and mortalities. Please note that the MAST database only provides information on permit number, operation name, RM and permit issue date. All other information must be obtained from MB Conservation.

Government Publication Date: Jul 1994-May 2019

Canadian Mine Locations: Private MINE

This information is collected from the Canadian & American Mines Handbook. The Mines database is a national database that provides over 290 listings on mines (listed as public companies) dealing primarily with precious metals and hard rocks. Listed are mines that are currently in operation, closed, suspended, or are still being developed (advanced projects). Their locations are provided as geographic coordinates (x, y and/or longitude, latitude). As of 2002, data pertaining to Canadian smelters and refineries has been appended to this database.

Government Publication Date: 1998-2009*

Mineral Occurrences: Provincial MNR

For over 25 years, Manitoba has been compiling Mineral Inventory Cards on mineral deposits in the province. This database was obtained from Manitoba Industry, Trade and Mines, and contains information on over 650 mineral occurrences in the province. Data is provided on the Mineral Inventory File No., Mineral Deposit Name, Product, Associated Minerals or Products of Value, NTS area, Name of Property Owner or Operator and Address, location, and geographical coordinates.

Government Publication Date: 1961-Mar 2019

Manitoba Oil and Gas Wells: Provincial MOGW

The Manitoba Oil and Gas Wells database was collected through the assistance of The Land Systems Company. Information is provided regarding license number and location for over 4,800 wells. Please note that this database will not be updated, information on wells drilled after May 2002 can be found in the Oil and Gas Wells (OGW) database under the `Private Source Database' section.

Government Publication Date: 1951-May 2002*

National Analysis of Trends in Emergencies System (NATES): Federal NATE

In 1974 Environment Canada established the National Analysis of Trends in Emergencies System (NATES) database, for the voluntary reporting of significant spill incidents. The data was to be used to assist in directing the work of the emergencies program. NATES ran from 1974 to 1994. Extensive information is available within this database including company names, place where the spill occurred, date of spill, cause, reason and source of spill, damage incurred, and amount, concentration, and volume of materials released.

Government Publication Date: 1974-1994*

National Defense & Canadian Forces Fuel Tanks: Federal NDFT

The Department of National Defense and the Canadian Forces maintains an inventory of all aboveground & underground fuel storage tanks located on DND lands. Our inventory provides information on the base name, location, tank type & capacity, tank contents, tank class, date of tank installation, date tank last used, and status of tank as of May 2001. This database will no longer be updated due to the new National Security protocols which have prohibited any release of this database.

Government Publication Date: Up to May 2001*

National Defense & Canadian Forces Spills: Federal NDSP

The Department of National Defense and the Canadian Forces maintains an inventory of spills to land and water. All spill sites have been classified under the "Transportation of Dangerous Goods Act - 1992". Our inventory provides information on the facility name, location, spill ID #, spill date, type of spill, as well as the quantity of substance spilled & recovered.

Government Publication Date: Mar 1999-Apr 2018

National Defence & Canadian Forces Waste Disposal Sites: Federal NDWD

The Department of National Defence and the Canadian Forces maintains an inventory of waste disposal sites located on DND lands. Where available, our inventory provides information on the base name, location, type of waste received, area of site, depth of site, year site opened/closed and status.

Government Publication Date: 2001-Apr 2007*

National Energy Board Pipeline Incidents: Federal NEBI

Locations of pipeline incidents from 2008 to present, made available by the Canada Energy Regulator (CER) - previously the National Energy Board (NEB). Includes incidents reported under the Onshore Pipeline Regulations and the Processing Plant Regulations related to pipelines under federal jurisdiction, does not include incident data related to pipelines under provincial or territorial jurisdiction.

Government Publication Date: 2008-Jun 30, 2019

National Energy Board Wells: Federal NEBP

The NEBW database contains information on onshore & offshore oil and gas wells that are outside provincial jurisdiction(s) and are thereby regulated by the National Energy Board. Data is provided regarding the operator, well name, well ID No./UWI, status, classification, well depth, spud and release date.

Government Publication Date: 1920-Feb 2003*

National Environmental Emergencies System (NEES): Federal NEES

In 2000, the Emergencies program implemented NEES, a reporting system for spills of hazardous substances. For the most part, this system only captured data from the Atlantic Provinces, some from Quebec and Ontario and a portion from British Columbia. Data for Alberta, Saskatchewan, Manitoba and the Territories was not captured. However, NEES is also a repository for previous Environment Canada spill datasets. NEES is composed of the historic datasets ' or Trends ' which dates from approximately 1974 to present. NEES Trends is a compilation of historic databases, which were merged and includes data from NATES (National Analysis of Trends in Emergencies System), ARTS (Atlantic Regional Trends System), and NEES. In 2001, the Emergencies Program determined that variations in reporting regimes and requirements between federal and provincial agencies made national spill reporting and trend analysis difficult to achieve. As a consequence, the department has focused efforts on capturing data on spills of substances which fall under its legislative authority only (CEPA and FA). As such, the NEES database will be decommissioned in December 2004.

Government Publication Date: 1974-2003*

National PCB Inventory: Federal NPCB

Environment Canada's National PCB inventory includes information on in-use PCB containing equipment in Canada including federal, provincial and private facilities. Federal out-of-service PCB containing equipment and PCB waste owned by the federal government or by federally regulated industries such as airlines, railway companies, broadcasting companies, telephone and telecommunications companies, pipeline companies, etc. are also listed. Although it is not Environment Canada's mandate to collect data on non-federal PCB waste, the National PCB inventory includes some information on provincial and private PCB waste and storage sites. Some addresses provided may be Head Office addresses and are not necessarily the location of where the waste is being used or stored.

Government Publication Date: 1988-2008*

National Pollutant Release Inventory: Federal NPRI

Environment Canada has defined the National Pollutant Release Inventory ("NPRI") as a federal government initiative designed to collect comprehensive national data regarding releases to air, water, or land, and waste transfers for recycling for more than 300 listed substances.

Government Publication Date: 1993-May 2017

Oil and Gas Wells: Private OGWW

The Nickle's Energy Group (publisher of the Daily Oil Bulletin) collects information on drilling activity including operator and well statistics. The well information database includes name, location, class, status and depth. The main Nickle's database is updated on a daily basis, however, this database is updated on a monthly basis. More information is available at www.nickles.com.

Government Publication Date: 1988-May 31, 2019

Canadian Pulp and Paper: Private PAP

This information is part of the Pulp and Paper Canada Directory. The Directory provides a comprehensive listing of the locations of pulp and paper mills and the products that they produce.

Government Publication Date: 1999, 2002, 2004, 2005, 2009-2014

Inventory of PCB Storage Sites: Provincial PCB

Manitoba's Hazardous Waste Program maintains a listing of all "active" PCB storage facilities. Inactive PCB storage equipment and/or disposal sites are not required to remain as part of the PCB inventory database for the province. Please note that some of the sites have no wastes in storage at present, but are retained should they be required for future acceptance of PCB equipment as it comes out of service. The records within this database only provide information on facility name and location. Information pertaining to the inventory of stored wastes and waste quantities at a designated site is only available by directly contacting the Hazardous Waste Program. Please note that this database will not be updated, information after 1999 can be found in the National PCB Inventory (NPCB) database.

Government Publication Date: 1998-1999*

Parks Canada Fuel Storage Tanks: Federal PCFT

Canadian Heritage maintains an inventory of known fuel storage tanks operated by Parks Canada, in both National Parks and at National Historic Sites. The database details information on site name, location, tank install/removal date, capacity, fuel type, facility type, tank design and owner/operator.

Government Publication Date: 1920-Jan 2005*

Manitoba Pits and Quarries: Provincial PITS

The Manitoba Pits and Quarries database is comprised of 3 different types of permits. 1.Quarry Lease and Exploration Permits, which have a ten year term with exclusive rights for crown minerals. Quarry Exploration permits have a three year term with exclusive rights. 2. Private Pits and Quarry Permits require annual registration of private aggregate operations in the province and 3. Casual Permits which are for annual permits of Crown materials.

Government Publication Date: 1994-Apr 2018

Sustainable Development Public Registry: Provincial PUBLIC REGISTRY

The public registry system contains information on projects that are undergoing environmental assessment under The Environmental Act and projects applying for a license under The Dangerous Goods Handling and Transportation Act. This listing is made available by Manitoba Sustainable Development.

Government Publication Date: Jun 30, 2019

Waste Receivers Summary: Provincial REC

Disposal of regulated waste is maintained through an operating waste management system or a waste disposal site operated or used pursuant to the terms and conditions of a Certificate of Approval or a Provisional Certificate of Approval. A waste receiving location is any site or facility to which waste is transferred through a waste carrier. A receiver of regulated waste is required to register the waste receiving facility. This database represents registered receivers of regulated wastes, identified by company name and address.

Government Publication Date: 1998-Jul 2017

Retail Fuel Storage Tanks: Private RST

This database includes an inventory of retail fuel outlet locations (including marinas) that have on their property gasoline, oil, waste oil, natural gas and / or propane storage tanks.

Government Publication Date: 1999-Jul 31, 2019

Scott's Manufacturing Directory: Private SCT

Scott's Directories is a data bank containing information on over 200,000 manufacturers across Canada. Even though Scott's listings are voluntary, it is the most comprehensive database of Canadian manufacturers available. Information concerning a company's address, plant size, and main products are included in this database.

Government Publication Date: 1992-Mar 2011*

Manitoba Spills: Provincial SPL

The Manitoba Conservation Environmental Management System (EMS) records spills from across the province. Information from this database includes incident type, substance type, reason, location of spill, contaminate info and responsible party.

Government Publication Date: Apr 2009-Mar 2019

Transport Canada Fuel Storage Tanks: Federal TCFT

List of fuel storage tanks currently or previously owned or operated by Transport Canada. This inventory also includes tanks on The Pickering Lands, which refers to 7,530 hectares (18,600 acres) of land in Pickering, Markham, and Uxbridge owned by the Government of Canada since 1972; properties on this land has been leased by the government since 1975, and falls under the Site Management Policy of Transport Canada, but is administered by Public Works and Government Services Canada. This inventory provides information on the site name, location, tank age, capacity and fuel type.

Government Publication Date: 1970-Aug 2018

Waste Disposal Site Inventory: Provincial WDS

Manitoba Conservation retains a separate inventory of all known active and inactive regulated waste disposal grounds and waste transfer facilities for each of the five regions in the province. Registered companies may hold a permit or certificate for release of the following waste types: Effluent, Refuse, Air and Special Waste Storage.

Government Publication Date: 1998*

Water Well Inventory: Provincial WWIS

The GW Drill database compiled by the Manitoba Water Stewardship Division and Groundwater Management Program provides information on water wells across the province. The GW Drill database is a compilation of records from various sources and is intended to provide water well, stratigraphic, and hydrogeologic background information. The compilation is extensive but is not a comprehensive or complete inventory of wells in the province. For many records, location has been provided in DLS (Dominion Land Survey) format and locations may be accurate to the section or quarter section only. Any analysis or interpretation of records or the absence thereof must take into consideration that the GW Drill database is not comprehensive and should not be used as an inventory.

Government Publication Date: 1880-May 2015

Definitions

Database Descriptions: This section provides a detailed explanation for each database including: source, information available, time coverage, and acronyms used. They are listed in alphabetic order.

Detail Report: This is the section of the report which provides the most detail for each individual record. Records are summarized by location, starting with the project property followed by records in closest proximity.

Distance: The distance value is the distance between plotted points, not necessarily the distance between the sites' boundaries. All values are an approximation.

Direction: The direction value is the compass direction of the site in respect to the project property and/or center point of the report.

Elevation: The elevation value is taken from the location at which the records for the site address have been plotted. All values are an approximation. Source: Google Elevation API.

Executive Summary: This portion of the report is divided into 3 sections:

'Report Summary'- Displays a chart indicating how many records fall on the project property and, within the report search radii.

'Site Report Summary'-Project Property'- This section lists all the records which fall on the project property. For more details, see the 'Detail Report' section.

'Site Report Summary-Surrounding Properties'- This section summarizes all records on adjacent properties, listing them in order of proximity from the project property. For more details, see the 'Detail Report' section.

Map Key: The map key number is assigned according to closest proximity from the project property. Map Key numbers always start at #1. The project property will always have a map key of '1' if records are available. If there is a number in brackets beside the main number, this will indicate the number of records on that specific property. If there is no number in brackets, there is only one record for that property.

The symbol and colour used indicates 'elevation': the red inverted triangle will dictate 'ERIS Sites with Lower Elevation', the yellow triangle will dictate 'ERIS Sites with Higher Elevation' and the orange square will dictate 'ERIS Sites with Same Elevation.'

Unplottables: These are records that could not be mapped due to various reasons, including limited geographic information. These records may or may not be in your study area, and are included as reference.

Appendix H

Phase I ESA and Interview Form

Dillon Consulting Limited

Site Reconnaissance & Interview Form
Phase One Environmental Site Assessment

This form is to be used for site reconnaissance when we are accompanied by a person with knowledge of the site use and/or history.

1. Project Information

Project name:	CHURCHILL PH 1/11 ESA DENE VILLAGE
Project number:	19-1615
Property address:	
Date:	OCT 1, 2019
Start time/end time:	
Dillon personnel name and title:	SHANE CHAPMAN, FIELD TECH

2. Interview Details

* INTERVIEWS CONDUCTED BY VANESSA KRAHN

INTERVIEW CONDUCTED IN-PERSON AT THE PHASE ONE ESA PROPERTY DURING SITE RECONNAISSANCE	
Name of Person Interviewed:	
Job Title or Connection to Property:	
Timeframe of Familiarity:	
Rationale for interview:	

3. General Site Reconnaissance Information

Weather conditions:	+10°C, PARTLY CLOUDY
Physical impediments identified during the site visit.	HEAVILY FORESTED SOME SNOW COVER ~1%
Did you have access to structures during the site visit?	yes
Are there any records available on-site for review?	yes

4. General Site and Operations Information

PROPERTY USE	SITE OBSERVATION	INTERVIEW RESPONSE
Current land use(s)/zoning and timeframe of use:	Vacant, residential	
Past land use(s)/zoning and timeframe(s) of use:	Residential	
Facility size and number of employees:	~60 homes (vacant)	

PROPERTY USE	SITE OBSERVATION	INTERVIEW RESPONSE
Is the facility currently in operation? *If yes, include a description of the operations, including processing or manufacturing. Does it include bulk fuel dispensing (e.g., gas station), garage, dry cleaner, commercial printing, photo developing, junkyard, landfill, waste treatment, storage or recycling?*	Houses NO Dog sledding company in operation Sweat lodge active	
Products manufactured at the property. *Include information on by-products where applicable*	NONE	
Tenant information and history *Business name, operations, land use, location, etc.*	Kelly Turcotte dog sledding.	
Current and former property easements or other uses *Include location and other relevant notes (e.g., electrical corridor, gas/oil pipelines, access roads, rail line or spur, etc.)*		
Regional topography and geology		
Site topography and geology	Gravel roadways, built up gravel pads, muskeg & swamp	

5. Site Structures

Make note of the information source (observation versus interview).
Special attention items can be summarized in Section 11.

STRUCTURE NAME OR NUMBER	CONSTRUCTION DETAILS (Location, date, floor area, number of floors, additions, above/below ground, entry and exit points, etc.)	HEATING, COOLING AND WASTE SYSTEMS (Existing and former, type, fuel source, vent and fill pipes, etc.)	NOTES (Current and former use of drains, pits and sumps, unidentified substances, staining or corrosion on floors and proximity to potential discharge location, etc.)
Dog Sledding Business	Near front of site, 1 floor Quonset on grade (Churchill River Mushing)	Propane WOOD OUTHOUSE	NONE
Sweet Lodge	1 floor, metal siding/roof. non-heated, wood door.	NONE	NONE

6. Storage Tanks and Containers

Make note of the information source (observation versus interview).
Type of container could include ASTs, USTs, industrial drums, pails, sacks of chemicals, bins, totes, etc.

TYPE OF CONTAINER	SIZE/ VOLUME	CONTENTS	DETAILS (Location, date of installation, construction material, pipes and infrastructure, etc.)	SECONDARY CONTAINMENT	IN USE/ OUT OF SERVICE	ADDITIONAL NOTES (Use, surface staining, spill history, tank condition, inspections and testing, remedial measures etc.)
NONE ACTIVE						

7. Mechanical Equipment N/A

TYPE	LOCATION	SITE OBSERVATION (Size, volumes, date of installation, problems, maintenance issues, hazardous chemicals, etc.)	INTERVIEW RESPONSE (Size, volumes, date of installation, problems, maintenance issues, hazardous chemicals, etc.)
In-ground hydraulic hoists			
Compressors			
Hydraulic elevators			
Welding equipment			
Paint/spray booths			

TYPE	LOCATION	SITE OBSERVATION (Size, volumes, date of installation, problems, maintenance issues, hazardous chemicals, etc.)	INTERVIEW RESPONSE (Size, volumes, date of installation, problems, maintenance issues, hazardous chemicals, etc.)
Degreasing equipment			
Lathes/machining equipment			
Other			

8. Utilities N/A

Include information on current and former utilities.

TYPE	LOCATION	SITE OBSERVATION (Construction details, utility corridors, type and duration of use, etc.)	INTERVIEW RESPONSE (Construction details, utility corridors, type and duration of use, etc.)
Water supply *(e.g., municipal, water well)* *Include specific water well details in the table below.*			
Electricity *Above or below ground*			

TYPE	LOCATION	SITE OBSERVATION (Construction details, utility corridors, type and duration of use, etc.)	INTERVIEW RESPONSE (Construction details, utility corridors, type and duration of use, etc.)
Heating systems *Natural gas, fuel oil, electric, coal, other*			
Surface water control *Municipal, dry wells, ditches, other*		1.	
Wastewater systems *Municipal, septic, other*			
Other			

9. Wells N/A

Include various types of water wells, oil and gas wells, current and former, etc.

TYPE	LOCATION	SITE OBSERVATION (Construction details, duration of use, etc.)	INTERVIEW RESPONSE (Construction details, duration of use, identified contaminants, etc.)

10. Hazardous Materials and Waste N/A

	LOCATION/ SOURCE	SITE OBSERVATION	INTERVIEW RESPONSE
Past or current use/storage of hazardous substances or petroleum products? *Individual containers greater than 5 gallon/19 liters, or aggregate of 50 gallons/190 liters* *(e.g., damaged or discarded automotive or industrial batteries, pesticides, paints, chlorinated solvents, other chemicals)*			

	LOCATION/ SOURCE	SITE OBSERVATION	INTERVIEW RESPONSE
Past or current wastes generated or stored on the property *Include details on solid waste management practices, type of wastes, storage, removal, incineration, on-site disposal*			
Materials dumped on the property, buried, or burned *Waste, unidentified materials or containers, hazardous materials, tires, industrial batteries, etc.*	SITE WIDE	FORMER COAL DUMP PILES	
Unidentified substances stored on the property			

11. Special Attention Items

USE OR STORAGE	LOCATION/ SOURCE	SITE OBSERVATION	INTERVIEW RESPONSE
PCBs *Could include PCB containing transformers, capacitors, hydraulic equipment, cables etc.*			

USE OR STORAGE	LOCATION/ SOURCE	SITE OBSERVATION	INTERVIEW RESPONSE
Fluorescent light ballasts older than late 1970s			
Asbestos containing materials *Pipe wrapping, wall insulation, concrete, floor/ceiling tiles, etc.*	SITE WIDE. ALL HOMES	SHINGLES, FLOORING TILES, TAR PAPER	
Lead *Paint, pipes, flashings, etc.*			
UFFI *Grid of small holes in the interior/ exterior finish of building*			
Ozone-depleting substances			
Mercury *Thermostats, etc.*			
Other *(e.g., radon, noise, vibration, magnetic fields – high voltage power lines, etc.)*			
Records or inspection reports indicating the presence of special attention items.			

12. Property Not Covered by Buildings/Structures

	LOCATION	SITE OBSERVATION	INTERVIEW RESPONSE
Ground surface cover			
Roads, parking and right-of-way			
Surface water features *Including ditches, streams, creeks, rivers, ponds, lakes, other* *Make note of water quality including oil or oily sheen, discolored water, staining, other*	SITE WIDE	HIGH WATER TABLE SITE WIDE	
Spills, or stained soil, vegetation or pavement *Include dates, locations, materials involved, volume of materials spilled, mitigation or remediation activities*			
Stressed vegetation			
Air emissions *Sources could include paint booths, generators, heating equipment, etc.*			

	LOCATION	SITE OBSERVATION	INTERVIEW RESPONSE
Areas where fill and debris materials appear to have been placed or graded			
Pits and lagoons *Mechanical, concrete, waste disposal, etc.*			
Fill materials *Includes surface fill, berms, material piles, site grading, topography changes, materials brought from a contaminated site*			
Potentially contaminating activities	SITE WIDE	COAL PILES	
Unidentified substances			
Pungent odors *Include current or former odors and their possible sources*			

13. Environmental Investigations and Legal Issues

PAST OR CURRENT	SITE OBSERVATION	INTERVIEW RESPONSE
Environmental site assessments or remediation		
Violations of environmental law		
Environmental liens or governmental notifications		
Lawsuits or administrative proceedings concerning an environmental release or threatened release		

14. Adjacent Properties and Properties in the Phase One ESA Study Area

Make note of the information source (observation versus interview).
Include description of water bodies and areas of natural significance

	PAST AND CURRENT		
LOCATION/ ADDRESS	TYPE OF USE	COMPANY NAME AND DESCRIPTION OF OPERATIONS	POTENTIALLY CONTAMINATING ACTIVITIES

15. Photograph Log

PHOTO NUMBER	TAKEN FROM	FACING (COMPASS DIRECTION)	DESCRIPTION
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2			
3			
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PHOTO NUMBER	TAKEN FROM	FACING (COMPASS DIRECTION)	DESCRIPTION
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PHOTO NUMBER	TAKEN FROM	FACING (COMPASS DIRECTION)	DESCRIPTION
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PHOTO NUMBER	TAKEN FROM	FACING (COMPASS DIRECTION)	DESCRIPTION
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PHOTO NUMBER	TAKEN FROM	FACING (COMPASS DIRECTION)	DESCRIPTION
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PHASE I ESA INTERVIEW FORM

Subject Property: Former Sayisi Dene Village

Name of Person Interviewed: Dan Sonmore

Job Title or Connection to Property: Manager Environmental Services PSPC

Familiarity with Property and Operations: Original Assement back 1995 assement & been to site numerous times

Timeframe of Familiarity:

Rationale for Interiewing: PSPC most familiarity with the site.

Interviewer: Vanessa Kahn

Date of Interview: September 30, 2019

Start/End Time of Interview: 1:30pm - 2:00pm

Location of Interview: Teleconference.

GENERAL INFORMATION

Ask Interviewee to describe any observed evidence or knowledge of related to past and current activities, events and conditions related to the following :

Property Use	
Current land use(s)?	- Sweat lodge on site - Vacant, former residences.
Past land use(s)?	- Residential Housing for transposed peoples. - Dog musher dog camp a couple years back (entrance of site)
Facility size and number of employees?	- can't recall exact confirm with historical report
Years facility has been operating at that location?	- see report

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PHASE I ESA INTERVIEW FORM

GENERAL INFORMATION Continued…	
Tenant history (business name, operations, land use, location)?	- none other than residential and dog musher
History of building renovations and additions?	- built and left as is just foundations remain
Property use as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard, landfill, or as a waste treatment storage, disposal, processing or recycling facility ?	- nothing to the best of his knowledge
Hazardous Materials	
Damaged or discarded automotive or industrial batteries, pesticides, paints, or other chemicals in individual containers of >5 gal (19 L) in volume or 50 gal (190 L) in the aggregate, stored on or used at the property or at the facility?	- coal dust piles, no evidence of containers of pesticides/chemicals etc
Past or current existence of hazardous substances or petroleum products on property or any facility on the property?	- No evidence.
Past or current waste(s) generated or stored on property or any facility on the property?	- no knowledge of waste disposal most likely to local garbage facility - no evidence of pits.
Hazardous substances or petroleum products, unidentified waste materials, tires, automotive or industrial batteries, or any other waste materials have been dumped above grade, buried and/or burned on the property?	- nothing of significance - maybe fire pits for residential use
Environmental site assessment of the property or facility that indicated the presence of hazardous substances or petroleum products on, or contamination of, the property or recommended further assessment of the property?	- none available site reports (one with supplemental)

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PHASE I ESA INTERVIEW FORM

GENERAL INFORMATION Continued...	
Unidentified Substances	
Unidentified waste materials dumped above grade, buried and/or burned on the property?	no recollection.
Storage Tanks	
Current registered or unregistered storage tanks (above or underground) located on the property - (age, size, content, location, condition)?	don't recall encountering in any site visits
Past registered or unregistered storage tanks (above or underground) located on the property - (age, size, content, location, condition)?	See above
Past or current vent pipes, fill pipes, or access ways indicating a filll pipe protruding from the ground on the property or adjacent to any structure located on the property?	See above
Past or current storage tank leaks, spills, inspection/testing, or remedial measures?	See above
Past or current observations of secondary containment for ASTs and collection of liquids?	See above
Storage Containers	
Any past or current industrial drums (typically 55 gal or 208 L) or sacks of chemicals located on the property or at the facility?	no recollection
Describe number, size, type, contents, location and manner of storage of chemicals (past/current).	
Odours	
Past or current strong, pungent or foul odours and their possible sources?	no recollection
Potable Water Supply	
Is property served by a private well or non-public water system - if yes, describe water system, plus see below?	probably hauled in

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PHASE I ESA INTERVIEW FORM

GENERAL INFORMATION Continued...	
Potable Water Supply Continued...	
Yes: have contaminatns been identified in the well or system that exceed guidelines applicable to the water system?	N/A
Yes: has the well has been designated as contaminated by any government environmental/health agency?	N/A
Yes: has the well has been designated as contaminated by any government environmental/health agency?	N/A
Special Attention Items	
Past or curent PCB storage or use on the property?	NO
Past or current transformers, capacitors, or hydraulic equipment on the property which may contain or have contained PCBs?	No
Any records or inspection reports indicating the presence/absence of PCBs in the items above?	No
Any transformers manufactured before approx. 1980 when PCBs were phased out?	No
Any fluorescent light ballasts older than late 1970s in use or on the property - any ballast serial numbers available or electrician confirmation ?	No
Asbestos-containing materials (pipe wrapping, wall insulation, concrete, floor/ceiling tiles)?	No (available report sampled for ACM's)
Lead based paints (older paint, peeling)?	NO
Urea Formaldehyde Foam insulation (UFFI) (grid of small holes in int/exterior finish of building)?	No -use 1970s, esp. '75-'78, to Dec. '80 in Canada and 1982 in US

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PHASE I ESA INTERVIEW FORM

GENERAL INFORMATION (continued)	
Special Attention Items Continued...	
Ozone-depleting substances used or stored on the property?	No
Mercury stored or used on the property - any mercury thermostats?	No
Other (e.g., radon, noise, EMF, vibration)?	No
Regulatory and Legal Issues	
Environmental liens or governmental notification relating to past or recurrent violations of environmental laws with respect to the property or any facility located on the property?	No
Past or current existence of environmental violations with respect to the property or any facility located on the property?	No
Past, threatened, or pending lawsuits or administrative proceedings concerning a release or threatened release of any hazardous substance or petroleum products involving the property by any owner or occupant of the property?	No

INTERIOR	
Limited Access Areas	
Any areas which may not be accessible that may be of environmental concern?	Sump if not on foundation or roadway.
Heating and Cooling	
Describe current heating and cooling system, including any backup provisions.	coal fired; coal piles at front of house; noticeable staing or piles
Past or current coal or heating oil use for heating and cooling (coal pile, tank & piping location)?	

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PHASE I ESA INTERVIEW FORM

INTERIOR (continued)	
Stains	
Past or current flooring, ceiling, drains, or walls within the facility that are stained by substances other than water or are emitting foul odours?	N/A
Past or current cracks in floor?	N/A
Drains and Sumps	
Describe location and condition of floor drains and sumps?	N/A footings on gravel
Describe past and current leak, staining or other evidence of contamination in drains and sumps?	

EXTERIOR	
Exterior Structures and Roofs	
Describe and provide any indication of contamination (e.g, stains).	N/A no site visits when housing was in place (only foundations)
General Description of Structures	
Describe number buildings and improvements, age, number of storeys and location, etc.	N/A
Topography, Geology and Hydrogeology	
Describe ground slope, surface water features, natural and fill geology, depth to water table, etc.	swampy in vegetation area probably draining towards river - railway track on southern boundry (swamp land inbetween) Pretty flat
Wells	
Describe any abandoned and existing wells (e.g., water, oil, gas, disposal).	- none noticed

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PHASE I ESA INTERVIEW FORM

EXTERIOR Continued...	
Sewage Disposal	
Describe method of sewage disposal on the property.	Not aware - suspect outhouse.
Pits and Lagoons	
Describe any past or current pits, ponds, or lagoons located on the property in connection with waste treatment or waste disposal?	- Not aware
Stained Materials	
Describe any past or current stained soil or pavement on the property?	- No other than coal piles
Stressed Vegetation	
Describe any past or current stressed vegetation on the property?	- Not aware
Fill	
Has fill dirt ever been brought onto the property that originated from a contaminated site?	- Probably aggregate for building foundations and roadways but not anticipated from contaminated site
Wastewater	
Does the property discharge waste water, on or adjacent to the property, other than storm water, into a storm water sewer system?	Unknown
Does the property discharge waste water, on or adjacent to the property, other than storm water, into a sanitary sewer system?	Unknown.
Waterways, Ditches, or Standing Water	
Describe any surface water features (including stormwater or runoff) on or adjacent to the property.	- Surrounding land fairly flat and swampy
Roads, Parking, and Right of Way	
Identifiy and describe.	- gravel road access.

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PHASE I ESA INTERVIEW FORM

ADJOINING PROPERTIES	
Is any adjoining property used for an industrial use?	Manitoba Hydro substation to the NE's. Railway track that would haul fuel and other materials to the South. Site is fairly remote.
Did you observe evidence of do you have any prior knowledge that any adjoining property has been used for an industrial use in the past?	
Did you observe evidence of do you have any prior knowledge that any adjoining property has been used for an industrial use in the past?	
Is any adjoining property used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment storage, disposal, processing or recycling facility - if so, specify?	
Did you observe evidence of do you have any prior knowledge that any adjoining property has been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment storage, disposal, processing or recycling facility - if so, specify?	

- Dog Mushing → will see if can get contact.
- current town administrator for above ↑ to discuss any environmental concerns
- Would be good if Dillon could make contact with someone from Churchill or the First Nation.

Preparer represents that to the best of the preparer's knowledge the above statements and facts are true and correct and to the best of the preparer's actual knowledge no material facts have been suppressed or misstated.

Signature

September 30, 2019

Date

Call back @ 2:30

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PHASE I ESA INTERVIEW FORM

Subject Property:	Former Sayisi Dene Village
Name of Person Interviewed:	Kelly Turcotte 204-675-0080
Job Title or Connection to Property:	operates dog musher on property
Familiarity with Property and Operations:	friends with people who lived on site historically
Timeframe of Familiarity:	Operated on site last 3-4 yrs
Rationale for Interiewing:	Operates on site (current land use only)
Interviewer:	Vanessa Krahn
Date of Interview:	October 1, 2019
Start/End Time of Interview:	2:40-2:50
Location of Interview:	Phone.

GENERAL INFORMATION

Ask Interviewee to describe any observed evidence or knowledge of related to past and current activities, events and conditions related to the following :

Property Use	
Current land use(s)?	Current Dog Musher o Tent frame, portable outhouse dog tours. Been on site for last 3-4 yrs
Past land use(s)?	Residential
Facility size and number of employees?	Himself
Years facility has been operating at that location?	3-4 yrs.

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PHASE I ESA INTERVIEW FORM

GENERAL INFORMATION Continued...	
Tenant history (business name, operations, land use, location)?	On-site currently - Sweat Lodge - 20+ yrs Wes. ↳ Churchill - & Himself Dog Musher
History of building renovations and additions?	N/A
Property use as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard, landfill, or as a waste treatment storage, disposal, processing or recycling facility ?	- None
Hazardous Materials	
Damaged or discarded automotive or industrial batteries, pesticides, paints, or other chemicals in individual containers of >5 gal (19 L) in volume or 50 gal (190 L) in the aggregate, stored on or used at the property or at the facility?	He does not have any hazardous materials on-site
Past or current existence of hazardous substances or petroleum products on property or any facility on the property?	
Past or current waste(s) generated or stored on property or any facility on the property?	
Hazardous substances or petroleum products, unidentified waste materials, tires, automotive or industrial batteries, or any other waste materials have been dumped above grade, buried and/or burned on the property?	
Environmental site assessment of the property or facility that indicated the presence of hazardous substances or petroleum products on, or contamination of, the property or recommended further assessment of the property?	

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PHASE I ESA INTERVIEW FORM

GENERAL INFORMATION Continued...	
Unidentified Substances	
Unidentified waste materials dumped above grade, buried and/or burned on the property?	- removed from site.
Storage Tanks	
Current registered or unregistered storage tanks (above or underground) located on the property - (age, size, content, location, condition)?	- He does not have storage tanks on-site
Past registered or unregistered storage tanks (above or underground) located on the property - (age, size, content, location, condition)?	
Past or current vent pipes, fill pipes, or access ways indicating a filll pipe protruding from the ground on the property or adjacent to any structure located on the property?	
Past or current storage tank leaks, spills, inspection/testing, or remedial measures?	
Past or current observations of secondary containment for ASTs and collection of liquids?	
Storage Containers	
Any past or current industrial drums (typically 55 gal or 208 L) or sacks of chemicals located on the property or at the facility?	He does not have storage containers on-site
Describe number, size, type, contents, location and manner of storage of chemicals (past/current).	
Odours	
Past or current strong, pungent or foul odours and their possible sources?	No current odours
Potable Water Supply	
Is property served by a private well or non-public water system - if yes, describe water system, plus see below?	No water on-site. He brings in water for hot chocolate.

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PHASE I ESA INTERVIEW FORM

GENERAL INFORMATION Continued...	
Potable Water Supply Continued...	
Yes: have contaminatns been identified in the well or system that exceed guidelines applicable to the water system?	N/A
Yes: has the well has been designated as contaminated by any government environmental/health agency?	N/A
Yes: has the well has been designated as contaminated by any government environmental/health agency?	N/A
Special Attention Items	
Past or curent PCB storage or use on the property?	N/A - no current
Past or current transformers, capacitors, or hydraulic equipment on the property which may contain or have contained PCBs?	
Any records or inspection reports indicating the presence/absence of PCBs in the items above?	
Any transformers manufactured before approx. 1980 when PCBs were phased out?	
Any fluorescent light ballasts older than late 1970s in use or on the property - any ballast serial numbers available or electrician confirmation ?	
Asbestos-containing materials (pipe wrapping, wall insulation, concrete, floor/ceiling tiles)?	
Lead based paints (older paint, peeling)?	
Urea Formaldehyde Foam insulation (UFFI) (grid of small holes in int/exterior finish of building)?	-use 1970s, esp. '75-'78, to Dec. '80 in Canada and 1982 in US

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PHASE I ESA INTERVIEW FORM

GENERAL INFORMATION (continued)	
Special Attention Items Continued...	
Ozone-depleting substances used or stored on the property?	
Mercury stored or used on the property - any mercury thermostats?	
Other (e.g., radon, noise, EMF, vibration)?	
Regulatory and Legal Issues	
Environmental liens or governmental notification relating to past or recurrent violations of environmental laws with respect to the property or any facility located on the property?	
Past or current existence of environmental violations with respect to the property or any facility located on the property?	
Past, threatened, or pending lawsuits or administrative proceedings concerning a release or threatened release of any hazardous substance or petroleum products involving the property by any owner or occupant of the property?	

INTERIOR	
Limited Access Areas	
Any areas which may not be accessible that may be of environmental concern?	Not that he's aware of, things have re-grown.
Heating and Cooling	
Describe current heating and cooling system, including any backup provisions.	Propane for his structure
Past or current coal or heating oil use for heating and cooling (coal pile, tank & piping location)?	

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PHASE I ESA INTERVIEW FORM

INTERIOR (continued)	
Stains	
Past or current flooring, ceiling, drains, or walls within the facility that are stained by substances other than water or are emitting foul odours?	
Past or current cracks in floor?	
Drains and Sumps	
Describe location and condition of floor drains and sumps?	
Describe past and current leak, staining or other evidence of contamination in drains and sumps?	
EXTERIOR	
Exterior Structures and Roofs	
Describe and provide any indication of contamination (e.g, stains).	
General Description of Structures	
Describe number buildings and improvements, age, number of storeys and location, etc.	Pole / tent structure
Topography, Geology and Hydrogeology	
Describe ground slope, surface water features, natural and fill geology, depth to water table, etc.	Fairly flat, some standing water in overgrown areas
Wells	
Describe any abandoned and existing wells (e.g., water, oil, gas, disposal).	None

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PHASE I ESA INTERVIEW FORM

EXTERIOR Continued...	
Sewage Disposal	
Describe method of sewage disposal on the property.	He has a portable self-contained outhouse
Pits and Lagoons	
Describe any past or current pits, ponds, or lagoons located on the property in connection with waste treatment or waste disposal?	No current
Stained Materials	
Describe any past or current stained soil or pavement on the property?	None grown over
Stressed Vegetation	
Describe any past or current stressed vegetation on the property?	None known, very overgrown
Fill	
Has fill dirt ever been brought onto the property that originated from a contaminated site?	brought in gravel from Churchill for base of pole structure from gravel pit - not contaminated
Wastewater	
Does the property discharge waste water, on or adjacent to the property, other than storm water, into a storm water sewer system?	No
Does the property discharge waste water, on or adjacent to the property, other than storm water, into a sanitary sewer system?	No
Waterways, Ditches, or Standing Water	
Describe any surface water features (including stormwater or runoff) on or adjacent to the property.	Some standing water.
Roads, Parking, and Right of Way	
Identifiy and describe.	Gravel road in that is in poor condition.

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PHASE I ESA INTERVIEW FORM

ADJOINING PROPERTIES	
Is any adjoining property used for an industrial use?	Some people trap in the area.
Did you observe evidence of do you have any prior knowledge that any adjoining property has been used for an industrial use in the past?	Hydro property; train to the south
Did you observe evidence of do you have any prior knowledge that any adjoining property has been used for an industrial use in the past?	
Is any adjoining property used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment storage, disposal, processing or recycling facility - if so, specify?	
Did you observe evidence of do you have any prior knowledge that any adjoining property has been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment storage, disposal, processing or recycling facility - if so, specify?	

- None, wishes gravel road in would be repaired.

Preparer represents that to the best of the preparer's knowledge the above statements and facts are true and correct and to the best of the preparer's actual knowledge no material facts have been suppressed or misstated.

Signature

October 1, 2019

Date

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PHASE I ESA INTERVIEW FORM

Subject Property:	Former Sayisi Dene Village
Name of Person Interviewed:	Florence Hamilton (204) 675-0135
Job Title or Connection to Property:	Sayisi Dene Member.
Familiarity with Property and Operations:	Member quite young when moved there, didn't spend a lot of time there.
Timeframe of Familiarity:	
Rationale for Interiewing:	Familiar with history of the site
Interviewer:	Vanessa Krahn
Date of Interview:	October 1, 2019
Start/End Time of Interview:	1:30pm - 1:45pm
Location of Interview:	Phone Call

GENERAL INFORMATION

Ask Interviewee to describe any observed evidence or knowledge of related to past and current activities, events and conditions related to the following :

Property Use	
Current land use(s)?	- Fellow on site (not a FN member) operating as dog kennel/mushers - Sweat lodge run by local men. (not FN members) not sure on how often it is used.
Past land use(s)?	- Residential usage
Facility size and number of employees?	- Around 60 housing units
Years facility has been operating at that location?	

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PHASE I ESA INTERVIEW FORM

GENERAL INFORMATION Continued...	
Tenant history (business name, operations, land use, location)?	-Village was used for residential no businesses
History of building renovations and additions?	N/A
Property use as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard, landfill, or as a waste treatment storage, disposal, processing or recycling facility ?	None.
Hazardous Materials	
Damaged or discarded automotive or industrial batteries, pesticides, paints, or other chemicals in individual containers of >5 gal (19 L) in volume or 50 gal (190 L) in the aggregate, stored on or used at the property or at the facility?	Only used for residential purposes
Past or current existence of hazardous substances or petroleum products on property or any facility on the property?	
Past or current waste(s) generated or stored on property or any facility on the property?	
Hazardous substances or petroleum products, unidentified waste materials, tires, automotive or industrial batteries, or any other waste materials have been dumped above grade, buried and/or burned on the property?	
Environmental site assessment of the property or facility that indicated the presence of hazardous substances or petroleum products on, or contamination of, the property or recommended further assessment of the property?	

PHASE I ESA INTERVIEW FORM

GENERAL INFORMATION Continued...	
Unidentified Substances	
Unidentified waste materials dumped above grade, buried and/or burned on the property?	-taken to the local dump. in Churchill not left on-site
Storage Tanks	
Current registered or unregistered storage tanks (above or underground) located on the property - (age, size, content, location, condition)?	- None Known
Past registered or unregistered storage tanks (above or underground) located on the property - (age, size, content, location, condition)?	
Past or current vent pipes, fill pipes, or access ways indicating a filll pipe protruding from the ground on the property or adjacent to any structure located on the property?	
Past or current storage tank leaks, spills, inspection/testing, or remedial measures?	
Past or current observations of secondary containment for ASTs and collection of liquids?	
Storage Containers	
Any past or current industrial drums (typically 55 gal or 208 L) or sacks of chemicals located on the property or at the facility?	None Known
Describe number, size, type, contents, location and manner of storage of chemicals (past/current).	
Odours	
Past or current strong, pungent or foul odours and their possible sources?	None Known.
Potable Water Supply	
Is property served by a private well or non-public water system - if yes, describe water system, plus see below?	-No running water, services water was hauled in.

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PHASE I ESA INTERVIEW FORM

GENERAL INFORMATION Continued...	
Potable Water Supply Continued...	
Yes: have contaminatns been identified in the well or system that exceed guidelines applicable to the water system?	
Yes: has the well has been designated as contaminated by any government environmental/health agency?	
Yes: has the well has been designated as contaminated by any government environmental/health agency?	
Special Attention Items	
Past or curent PCB storage or use on the property?	None Known
Past or current transformers, capacitors, or hydraulic equipment on the property which may contain or have contained PCBs?	
Any records or inspection reports indicating the presence/absence of PCBs in the items above?	
Any transformers manufactured before approx. 1980 when PCBs were phased out?	
Any fluorescent light ballasts older than late 1970s in use or on the property - any ballast serial numbers available or electrician confirmation ?	
Asbestos-containing materials (pipe wrapping, wall insulation, concrete, floor/ceiling tiles)?	
Lead based paints (older paint, peeling)?	
Urea Formaldehyde Foam insulation (UFFI) (grid of small holes in int/exterior finish of building)?	-use 1970s, esp. '75-'78, to Dec. '80 in Canada and 1982 in US

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PHASE I ESA INTERVIEW FORM

GENERAL INFORMATION (continued)	
Special Attention Items Continued...	
Ozone-depleting substances used or stored on the property?	None Known
Mercury stored or used on the property - any mercury thermostats?	
Other (e.g., radon, noise, EMF, vibration)?	
Regulatory and Legal Issues	
Environmental liens or governmental notification relating to past or recurrent violations of environmental laws with respect to the property or any facility located on the property?	None Known
Past or current existence of environmental violations with respect to the property or any facility located on the property?	
Past, threatened, or pending lawsuits or administrative proceedings concerning a release or threatened release of any hazardous substance or petroleum products involving the property by any owner or occupant of the property?	

INTERIOR	
Limited Access Areas	
Any areas which may not be accessible that may be of environmental concern?	None Known
Heating and Cooling	
Describe current heating and cooling system, including any backup provisions.	Heating was done by coal and wood. Coal was dropped off in piles at the front of houses
Past or current coal or heating oil use for heating and cooling (coal pile, tank & piping location)?	

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PHASE I ESA INTERVIEW FORM

INTERIOR (continued)	
Stains	
Past or current flooring, ceiling, drains, or walls within the facility that are stained by substances other than water or are emitting foul odours?	None Known
Past or current cracks in floor?	
Drains and Sumps	
Describe location and condition of floor drains and sumps?	None Known
Describe past and current leak, staining or other evidence of contamination in drains and sumps?	

EXTERIOR	
Exterior Structures and Roofs	
Describe and provide any indication of contamination (e.g, stains).	Tin ~~building~~. None Known
General Description of Structures	
Describe number buildings and improvements, age, number of storeys and location, etc.	Tin Building - Sweat lodge Pole Structure - Dog Musher
Topography, Geology and Hydrogeology	
Describe ground slope, surface water features, natural and fill geology, depth to water table, etc.	- houses foundations, ditches alongside road, material would have been brought in as low lying. Land is very muskeg.
Wells	
Describe any abandoned and existing wells (e.g., water, oil, gas, disposal).	None

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PHASE I ESA INTERVIEW FORM

EXTERIOR Continued...	
Sewage Disposal	
Describe method of sewage disposal on the property.	- She thinks it would have been removed off-site to lagoon.
Pits and Lagoons	
Describe any past or current pits, ponds, or lagoons located on the property in connection with waste treatment or waste disposal?	- None Known
Stained Materials	
Describe any past or current stained soil or pavement on the property?	- Not aware
Stressed Vegetation	
Describe any past or current stressed vegetation on the property?	- Not aware.
Fill	
Has fill dirt ever been brought onto the property that originated from a contaminated site?	- would have to bring in material for foundation & roads.
Wastewater	
Does the property discharge waste water, on or adjacent to the property, other than storm water, into a storm water sewer system?	- No
Does the property discharge waste water, on or adjacent to the property, other than storm water, into a sanitary sewer system?	- No
Waterways, Ditches, or Standing Water	
Describe any surface water features (including stormwater or runoff) on or adjacent to the property.	Low lying area, small ditches
Roads, Parking, and Right of Way	
Identifiy and describe.	Gravel road into site.

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PHASE I ESA INTERVIEW FORM

ADJOINING PROPERTIES	
Is any adjoining property used for an industrial use?	Historically the village was remote; not much in the surrounding area
Did you observe evidence of do you have any prior knowledge that any adjoining property has been used for an industrial use in the past?	
Did you observe evidence of do you have any prior knowledge that any adjoining property has been used for an industrial use in the past?	
Is any adjoining property used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment storage, disposal, processing or recycling facility - if so, specify? No	- Hydro station next (after FN left) - Railway tracks - Across road metal dump.
Did you observe evidence of do you have any prior knowledge that any adjoining property has been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment storage, disposal, processing or recycling facility - if so, specify?	

- Stayed for short time; only residential
- wouldn't expect any historical usage to impact as the FN was not present there for very long.

Preparer represents that to the best of the preparer's knowledge the above statements and facts are true and correct and to the best of the preparer's actual knowledge no material facts have been suppressed or misstated.

Signature

October 1, 2019
Date

Appendix I

Laboratory Result

Your Project #: 19-1615
Your C.O.C. #: 1 OF 4, 2 OF 4, 3 OF 4, 4 OF 4

Attention: Shane Chapman

DILLON CONSULTING LTD.
1558 Willson Place
Winnipeg, MB
CANADA R3T 0Y4

Report Date: 2019/10/29
Report #: R2803361
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: B986155
Received: 2019/10/08, 08:15

Sample Matrix: Soil
Samples Received: 33

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 by HS GC/MS/FID (MeOH extract) (1)	1	2019/10/09	2019/10/10	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 by HS GC/MS/FID (MeOH extract) (1)	1	2019/10/11	2019/10/13	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 by HS GC/MS/FID (MeOH extract) (1, 2)	4	N/A	2019/10/10	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 by HS GC/MS/FID (MeOH extract) (1, 2)	8	N/A	2019/10/11	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 by HS GC/MS/FID (MeOH extract) (1, 2)	19	N/A	2019/10/13	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX (1)	13	N/A	2019/10/11		Auto Calc
F1-BTEX (1)	20	N/A	2019/10/15		Auto Calc
CCME Hydrocarbons (F2-F4 in soil) (1, 3)	22	2019/10/10	2019/10/10	AB SOP-00036	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in soil) (1, 3)	11	2019/10/10	2019/10/11	AB SOP-00036	CCME PHC-CWS m
Elements by ICPMS - Soils (1)	6	2019/10/11	2019/10/15	AB SOP-00001 / AB SOP-00043	EPA 6020b R2 m
Elements by ICPMS - Soils (1)	27	2019/10/11	2019/10/16	AB SOP-00001 / AB SOP-00043	EPA 6020b R2 m
Moisture (1)	33	N/A	2019/10/11	AB SOP-00002	CCME PHC-CWS m
Index of Additive Cancer Risk (1)	32	N/A	2019/10/11		Auto Calc
Benzo[a]pyrene Equivalency (1)	32	N/A	2019/10/11		Auto Calc
PAH in Soil by GC/MS (1)	25	2019/10/10	2019/10/10	AB SOP-00036 / AB SOP-00003	EPA 3540C/8270E m
PAH in Soil by GC/MS (1)	7	2019/10/10	2019/10/11	AB SOP-00036 / AB SOP-00003	EPA 3540C/8270E m
Total LMW, HMW, Total PAH Calc (1)	32	N/A	2019/10/11		Auto Calc
Particle Size by Sieve (75 micron) (1)	3	N/A	2019/10/29		Auto Calc
Particle Size by Sieve (1)	3	N/A	2019/10/29	AB SOP-00022	ASTM D6913-17 m
VOCs in Soil by HS GC/MS (Std List) (1, 2)	1	N/A	2019/10/11	AB SOP-00056	EPA 5021a/8260d m

Remarks:

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been

Bureau Veritas Laboratories Winnipeg: Unit D, 675 Berry Street R3H 1A7 Telephone (204) 772-7276 Fax (204) 772-2386

Your Project #: 19-1615
Your C.O.C. #: 1 OF 4, 2 OF 4, 3 OF 4, 4 OF 4

Attention: Shane Chapman

DILLON CONSULTING LTD.
1558 Willson Place
Winnipeg, MB
CANADA R3T 0Y4

Report Date: 2019/10/29
Report #: R2803361
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: B986155
Received: 2019/10/08, 08:15

accounted for when stating conformity to the referenced standard.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by BV Labs, unless otherwise agreed in writing. BV Labs is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by BV Labs Calgary Environmental
(2) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is date sampled unless otherwise stated.
(3) All CCME results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil, Validation of Performance-Based Alternative Methods September 2003. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Janelle Kochan, B.Sc., Senior Customer Service Representative
Email: Janelle.KOCHAN@bvlabs.com
Phone# (204)259-0231
==========
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

RESULTS OF CHEMICAL ANALYSES OF SOIL

BV Labs ID		WQ9002		WQ9005		WQ9006		
Sampling Date		2019/10/03 15:00		2019/10/03 15:30		2019/10/03 15:40		
COC Number		3 OF 4		4 OF 4		4 OF 4		
	UNITS	**SS19-30**	**QC Batch**	**SS19-32**	**QC Batch**	**SS19-33**	**RDL**	**QC Batch**
Physical Properties								
Grain Size	N/A	COARSE	9639525	FINE	9639525	FINE	N/A	9639525
Sieve - #10 (>2.00mm)	%	11	9646575	8.1	9646867	4.5	0.20	9646575
Sieve - #200 (>0.075mm)	%	83	9646575	42	9646867	33	0.20	9646575
Sieve - Pan	%	17	9646575	58	9646867	67	0.20	9646575

RDL = Reportable Detection Limit
N/A = Not Applicable

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BV Labs Job #: B986155
Report Date: 2019/10/29

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Client Project #: 19-1615
Sampler Initials: STC

PETROLEUM HYDROCARBONS (CCME)

BV Labs ID		WQ8967	WQ8968	WQ8969	WQ8970	WQ8971	WQ8972	WQ8973		
Sampling Date		2019/10/02 12:30	2019/10/02 12:35	2019/10/02 12:45	2019/10/02 13:00	2019/10/02 13:10	2019/10/02 13:20	2019/10/02 13:35		
COC Number		1 OF 4	1 OF 4	1 OF 4	1 OF 4	1 OF 4	1 OF 4	1 OF 4		
	UNITS	**SS19-01**	**SS19-02**	**SS19-03**	**SS19-04**	**SS19-05**	**SS19-06**	**SS19-07**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	97	94	190	43	170	110	150	10	9622653
F3 (C16-C34 Hydrocarbons)	mg/kg	230	220	570	140	640	400	450	50	9622653
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	110	<50	130	69	72	50	9622653
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	Yes	Yes		9622653
Surrogate Recovery (%)										
O-TERPHENYL (sur.)	%	102	95	96	94	91	92	93		9622653
RDL = Reportable Detection Limit										

BV Labs ID		WQ8974	WQ8975	WQ8976	WQ8979	WQ8980	WQ8981	WQ8982		
Sampling Date		2019/10/02 13:45	2019/10/02 14:00	2019/10/02 14:15	2019/10/02 14:30	2019/10/02 14:45	2019/10/03 09:30	2019/10/03 09:35		
COC Number		1 OF 4	1 OF 4	1 OF 4	2 OF 4	2 OF 4	2 OF 4	2 OF 4		
	UNITS	**SS19-08**	**SS19-09**	**SS19-10**	**SS19-11**	**SS19-12**	**SS19-13**	**SS19-14**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	74	160	150	57	140	130	170	10	9622653
F3 (C16-C34 Hydrocarbons)	mg/kg	220	470	420	180	510	370	430	50	9622653
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	84	66	<50	93	63	72	50	9622653
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	Yes	Yes		9622653
Surrogate Recovery (%)										
O-TERPHENYL (sur.)	%	101	98	97	101	96	95	94		9622653
RDL = Reportable Detection Limit										

BV Labs ID		WQ8983	WQ8984	WQ8985	WQ8986	WQ8987	WQ8988	WQ8988		
Sampling Date		2019/10/03 09:50	2019/10/03 10:00	2019/10/03 10:05	2019/10/03 10:15	2019/10/03 10:25	2019/10/03 10:35	2019/10/03 10:35		
COC Number		2 OF 4	2 OF 4	2 OF 4	2 OF 4	2 OF 4	2 OF 4	2 OF 4		
	UNITS	**SS19-15**	**SS19-16**	**SS19-17**	**SS19-18**	**SS19-19**	**SS19-20**	**SS19-20 Lab-Dup**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	97	99	160	140	180	180	140	10	9622653
F3 (C16-C34 Hydrocarbons)	mg/kg	250	220	400	410	470	530	470	50	9622653
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	67	130	86	82	91	50	9622653
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	Yes	Yes		9622653
Surrogate Recovery (%)										
O-TERPHENYL (sur.)	%	96	95	96	99	100	97	97		9622653
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate										

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BV Labs Job #: B986155
Report Date: 2019/10/29

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Client Project #: 19-1615
Sampler Initials: STC

PETROLEUM HYDROCARBONS (CCME)

BV Labs ID		WQ8993	WQ8994	WQ8995	WQ8996	WQ8997	WQ8998	WQ8999		
Sampling Date		2019/10/03 10:45	2019/10/03 10:50	2019/10/03 10:55	2019/10/03 11:00	2019/10/03 11:05	2019/10/03 11:10	2019/10/03 11:20		
COC Number		3 OF 4	3 OF 4	3 OF 4	3 OF 4	3 OF 4	3 OF 4	3 OF 4		
	UNITS	**SS19-21**	**SS19-22**	**SS19-23**	**SS19-24**	**SS19-25**	**SS19-26**	**SS19-27**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	180	240	220	260	92	190	150	10	9622663
F3 (C16-C34 Hydrocarbons)	mg/kg	480	600	460	670	250	510	460	50	9622663
F4 (C34-C50 Hydrocarbons)	mg/kg	80	88	83	120	51	95	110	50	9622663
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	Yes	Yes		9622663
Surrogate Recovery (%)										
O-TERPHENYL (sur.)	%	92	91	96	95	94	91	96		9622663

RDL = Reportable Detection Limit

BV Labs ID		WQ9000		WQ9001		WQ9002		WQ9004		WQ9005		
Sampling Date		2019/10/03 11:30		2019/10/03 11:45		2019/10/03 15:00		2019/10/03 15:15		2019/10/03 15:30		
COC Number		3 OF 4		3 OF 4		3 OF 4		4 OF 4		4 OF 4		
	UNITS	**SS19-28**	**RDL**	**SS19-29**	**RDL**	**SS19-30**	**RDL**	**SS19-31**	**RDL**	**SS19-32**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon												
F2 (C10-C16 Hydrocarbons)	mg/kg	50	10	<25 (1)	25	<10	10	<21 (2)	21	<10	10	9622663
F3 (C16-C34 Hydrocarbons)	mg/kg	140	50	650 (1)	59	<50	50	<100 (2)	100	<50	50	9622663
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	50	190 (1)	50	<50	50	<100 (2)	100	<50	50	9622663
Reached Baseline at C50	mg/kg	Yes		Yes		Yes		Yes		Yes		9622663
Surrogate Recovery (%)												
O-TERPHENYL (sur.)	%	94		98		96		101		98		9622663

RDL = Reportable Detection Limit
(1) Detection limits calculated based on method detection limits (MDLs) due to high moisture content, sample contains => 50% moisture. Uncertainty of values may be increased.
(2) Detection limits raised due to high moisture content, sample contains => 50% moisture.

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BV Labs Job #: B986155
Report Date: 2019/10/29

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Client Project #: 19-1615
Sampler Initials: STC

PETROLEUM HYDROCARBONS (CCME)

BV Labs ID		WQ9006	WQ9006		
Sampling Date		2019/10/03 15:40	2019/10/03 15:40		
COC Number		4 OF 4	4 OF 4		
	UNITS	**SS19-33**	**SS19-33 Lab-Dup**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon					
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	10	9622663
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	50	9622663
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	50	9622663
Reached Baseline at C50	mg/kg	Yes	Yes		9622663
Surrogate Recovery (%)					
O-TERPHENYL (sur.)	%	95	97		9622663

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

PHYSICAL TESTING (SOIL)

BV Labs ID		WQ8967	WQ8968	WQ8969	WQ8970	WQ8971	WQ8972	WQ8973		
Sampling Date		2019/10/02 12:30	2019/10/02 12:35	2019/10/02 12:45	2019/10/02 13:00	2019/10/02 13:10	2019/10/02 13:20	2019/10/02 13:35		
COC Number		1 OF 4	1 OF 4	1 OF 4	1 OF 4	1 OF 4	1 OF 4	1 OF 4		
	UNITS	**SS19-01**	**SS19-02**	**SS19-03**	**SS19-04**	**SS19-05**	**SS19-06**	**SS19-07**	**RDL**	**QC Batch**
Physical Properties										
Moisture	%	28	33	31	24	32	34	28	0.30	9623376
RDL = Reportable Detection Limit										

BV Labs ID		WQ8974	WQ8975	WQ8976	WQ8979	WQ8980	WQ8981	WQ8982		
Sampling Date		2019/10/02 13:45	2019/10/02 14:00	2019/10/02 14:15	2019/10/02 14:30	2019/10/02 14:45	2019/10/03 09:30	2019/10/03 09:35		
COC Number		1 OF 4	1 OF 4	1 OF 4	2 OF 4	2 OF 4	2 OF 4	2 OF 4		
	UNITS	**SS19-08**	**SS19-09**	**SS19-10**	**SS19-11**	**SS19-12**	**SS19-13**	**SS19-14**	**RDL**	**QC Batch**
Physical Properties										
Moisture	%	28	27	25	28	27	29	31	0.30	9623376
RDL = Reportable Detection Limit										

BV Labs ID		WQ8983	WQ8984	WQ8985	WQ8986	WQ8987	WQ8988	WQ8988		
Sampling Date		2019/10/03 09:50	2019/10/03 10:00	2019/10/03 10:05	2019/10/03 10:15	2019/10/03 10:25	2019/10/03 10:35	2019/10/03 10:35		
COC Number		2 OF 4	2 OF 4	2 OF 4	2 OF 4	2 OF 4	2 OF 4	2 OF 4		
	UNITS	**SS19-15**	**SS19-16**	**SS19-17**	**SS19-18**	**SS19-19**	**SS19-20**	**SS19-20 Lab-Dup**	**RDL**	**QC Batch**
Physical Properties										
Moisture	%	31	27	26	9.1	36	23	22	0.30	9623376
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate										

BV Labs ID		WQ8993	WQ8994	WQ8995	WQ8996	WQ8997	WQ8998	WQ8999		
Sampling Date		2019/10/03 10:45	2019/10/03 10:50	2019/10/03 10:55	2019/10/03 11:00	2019/10/03 11:05	2019/10/03 11:10	2019/10/03 11:20		
COC Number		3 OF 4	3 OF 4	3 OF 4	3 OF 4	3 OF 4	3 OF 4	3 OF 4		
	UNITS	**SS19-21**	**SS19-22**	**SS19-23**	**SS19-24**	**SS19-25**	**SS19-26**	**SS19-27**	**RDL**	**QC Batch**
Physical Properties										
Moisture	%	23	26	28	27	30	24	28	0.30	9622866
RDL = Reportable Detection Limit										

BV Labs ID		WQ9000	WQ9001	WQ9002	WQ9004	WQ9005	WQ9006		
Sampling Date		2019/10/03 11:30	2019/10/03 11:45	2019/10/03 15:00	2019/10/03 15:15	2019/10/03 15:30	2019/10/03 15:40		
COC Number		3 OF 4	3 OF 4	3 OF 4	4 OF 4	4 OF 4	4 OF 4		
	UNITS	**SS19-28**	**SS19-29**	**SS19-30**	**SS19-31**	**SS19-32**	**SS19-33**	**RDL**	**QC Batch**
Physical Properties									
Moisture	%	20	84	17	51	12	15	0.30	9622866
RDL = Reportable Detection Limit									

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ8967	WQ8968	WQ8969	WQ8970	WQ8971	WQ8972		
Sampling Date		2019/10/02 12:30	2019/10/02 12:35	2019/10/02 12:45	2019/10/02 13:00	2019/10/02 13:10	2019/10/02 13:20		
COC Number		1 OF 4	1 OF 4	1 OF 4	1 OF 4	1 OF 4	1 OF 4		
	UNITS	**SS19-01**	**SS19-02**	**SS19-03**	**SS19-04**	**SS19-05**	**SS19-06**	**RDL**	**QC Batch**
Polycyclic Aromatics									
Index of Additive Cancer Risk(IACR)	N/A	0.12	0.14	0.25	<0.10	0.26	0.33	0.10	9620342
Acenaphthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9622657
B[a]P TPE Total Potency Equivalents	mg/kg	<0.0071	0.0080	0.010	<0.0071	0.010	0.020	0.0071	9620343
Acenaphthylene	mg/kg	0.0090	0.0082	0.016	<0.0050	0.013	0.0088	0.0050	9622657
Acridine	mg/kg	0.015	0.016	0.028	<0.010	0.024	0.017	0.010	9622657
Anthracene	mg/kg	<0.0040	<0.0040	0.0080	<0.0040	0.0073	<0.0040	0.0040	9622657
Benzo(a)anthracene	mg/kg	0.0089	0.010	0.020	<0.0050	0.025	0.023	0.0050	9622657
Benzo(b&j)fluoranthene	mg/kg	0.0086	0.012	0.023	0.0074	0.021	0.030	0.0050	9622657
Benzo(k)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9622657
Benzo(g,h,i)perylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.010	0.0050	9622657
Benzo(c)phenanthrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9622657
Benzo(a)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.010	0.0050	9622657
Benzo(e)pyrene	mg/kg	<0.0050	0.0075	0.012	<0.0050	0.013	0.021	0.0050	9622657
Chrysene	mg/kg	0.0090	0.012	0.025	0.0074	0.025	0.022	0.0050	9622657
Dibenz(a,h)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9622657
Fluoranthene	mg/kg	0.049	0.054	0.12	0.031	0.12	0.074	0.0050	9622657
Fluorene	mg/kg	<0.0050	<0.0050	0.011 (1)	<0.0050	0.0087 (1)	<0.0050	0.0050	9622657
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.011	0.0050	9622657
2-Methylnaphthalene	mg/kg	0.12	0.12	0.21	0.029	0.15	0.096	0.0050	9622657
Naphthalene	mg/kg	0.042	0.040	0.083	0.0063	0.047	0.026	0.0050	9622657
Phenanthrene	mg/kg	0.057	0.065	0.13	0.029	0.13	0.071	0.0050	9622657
Perylene	mg/kg	0.011	0.017	0.026	0.012	0.022	0.021	0.0050	9622657
Pyrene	mg/kg	0.056	0.058	0.14	0.034	0.15	0.098	0.0050	9622657
Quinoline	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9622657
Low Molecular Weight PAH`s	mg/kg	0.24	0.25	0.49	0.064	0.38	0.22	0.010	9620345
High Molecular Weight PAH`s	mg/kg	0.13	0.15	0.32	0.080	0.34	0.28	0.0050	9620345
Total PAH	mg/kg	0.37	0.39	0.82	0.14	0.73	0.50	0.010	9620345
Surrogate Recovery (%)									
D10-ANTHRACENE (sur.)	%	80	79	75	84	69	75		9622657
D8-ACENAPHTHYLENE (sur.)	%	79	79	75	83	70	75		9622657
D8-NAPHTHALENE (sur.)	%	72	73	74	75	69	70		9622657

RDL = Reportable Detection Limit
(1) Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.

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BV Labs Job #: B986155
Report Date: 2019/10/29

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Client Project #: 19-1615
Sampler Initials: STC

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ8967	WQ8968	WQ8969	WQ8970	WQ8971	WQ8972		
Sampling Date		2019/10/02 12:30	2019/10/02 12:35	2019/10/02 12:45	2019/10/02 13:00	2019/10/02 13:10	2019/10/02 13:20		
COC Number		1 OF 4	1 OF 4	1 OF 4	1 OF 4	1 OF 4	1 OF 4		
	UNITS	**SS19-01**	**SS19-02**	**SS19-03**	**SS19-04**	**SS19-05**	**SS19-06**	**RDL**	**QC Batch**
TERPHENYL-D14 (sur.)	%	75	76	76	80	71	73		9622657
RDL = Reportable Detection Limit									

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DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ8973	WQ8974	WQ8975	WQ8976	WQ8979	WQ8980		
Sampling Date		2019/10/02 13:35	2019/10/02 13:45	2019/10/02 14:00	2019/10/02 14:15	2019/10/02 14:30	2019/10/02 14:45		
COC Number		1 OF 4	1 OF 4	1 OF 4	1 OF 4	2 OF 4	2 OF 4		
	UNITS	**SS19-07**	**SS19-08**	**SS19-09**	**SS19-10**	**SS19-11**	**SS19-12**	**RDL**	**QC Batch**
Polycyclic Aromatics									
Index of Additive Cancer Risk(IACR)	N/A	0.31	0.12	0.12	0.15	0.13	0.39	0.10	9620342
Acenaphthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9622657
B[a]P TPE Total Potency Equivalents	mg/kg	0.018	<0.0071	0.0080	0.0080	<0.0071	0.024	0.0071	9620343
Acenaphthylene	mg/kg	0.013	<0.0050	0.013 (1)	0.014 (1)	<0.0050	0.012 (1)	0.0050	9622657
Acridine	mg/kg	0.020	0.018	0.024	0.018	<0.010	0.018	0.010	9622657
Anthracene	mg/kg	0.0081	<0.0040	<0.0040	0.0057	<0.0040	0.0081	0.0040	9622657
Benzo(a)anthracene	mg/kg	0.025	0.0093	0.011	0.014	0.0081	0.039	0.0050	9622657
Benzo(b&j)fluoranthene	mg/kg	0.026	0.0085	0.0073	0.010	0.010	0.031	0.0050	9622657
Benzo(k)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9622657
Benzo(g,h,i)perylene	mg/kg	0.0075	<0.0050	<0.0050	<0.0050	<0.0050	0.0085	0.0050	9622657
Benzo(c)phenanthrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0077	0.0050	9622657
Benzo(a)pyrene	mg/kg	0.0086	<0.0050	<0.0050	<0.0050	<0.0050	0.013	0.0050	9622657
Benzo(e)pyrene	mg/kg	0.018	<0.0050	<0.0050	<0.0050	<0.0050	0.021	0.0050	9622657
Chrysene	mg/kg	0.027	0.0096	0.014	0.015	0.0090	0.033	0.0050	9622657
Dibenz(a,h)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9622657
Fluoranthene	mg/kg	0.096	0.040	0.059	0.069	0.031	0.13	0.0050	9622657
Fluorene	mg/kg	0.010 (1)	<0.0050	0.010 (1)	0.0084 (1)	<0.0050	0.0085 (1)	0.0050	9622657
Indeno(1,2,3-cd)pyrene	mg/kg	0.0083	<0.0050	<0.0050	<0.0050	<0.0050	0.0071	0.0050	9622657
2-Methylnaphthalene	mg/kg	0.19	0.060	0.19	0.22	0.044	0.17	0.0050	9622657
Naphthalene	mg/kg	0.077	0.018	0.069	0.095	0.013	0.061	0.0050	9622657
Phenanthrene	mg/kg	0.11	0.042	0.079	0.086	0.031	0.14	0.0050	9622657
Perylene	mg/kg	0.020	0.012	0.023	0.014	0.010	0.027	0.0050	9622657
Pyrene	mg/kg	0.13	0.056	0.096	0.095	0.034	0.15	0.0050	9622657
Quinoline	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9622657
Low Molecular Weight PAH`s	mg/kg	0.42	0.14	0.39	0.45	0.088	0.41	0.010	9620345
High Molecular Weight PAH`s	mg/kg	0.32	0.12	0.19	0.20	0.092	0.41	0.0050	9620345
Total PAH	mg/kg	0.75	0.26	0.58	0.65	0.18	0.82	0.010	9620345
Surrogate Recovery (%)									
D10-ANTHRACENE (sur.)	%	71	81	70	71	84	75		9622657
D8-ACENAPHTHYLENE (sur.)	%	71	80	70	72	82	75		9622657
D8-NAPHTHALENE (sur.)	%	69	72	70	70	74	71		9622657

RDL = Reportable Detection Limit
(1) Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.

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BV Labs Job #: B986155
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Client Project #: 19-1615
Sampler Initials: STC

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ8973	WQ8974	WQ8975	WQ8976	WQ8979	WQ8980		
Sampling Date		2019/10/02 13:35	2019/10/02 13:45	2019/10/02 14:00	2019/10/02 14:15	2019/10/02 14:30	2019/10/02 14:45		
COC Number		1 OF 4	1 OF 4	1 OF 4	1 OF 4	2 OF 4	2 OF 4		
	UNITS	**SS19-07**	**SS19-08**	**SS19-09**	**SS19-10**	**SS19-11**	**SS19-12**	**RDL**	**QC Batch**
TERPHENYL-D14 (sur.)	%	71	77	73	72	79	74		9622657
RDL = Reportable Detection Limit									

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Client Project #: 19-1615
Sampler Initials: STC

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ8981	WQ8982	WQ8983	WQ8984	WQ8985		
Sampling Date		2019/10/03 09:30	2019/10/03 09:35	2019/10/03 09:50	2019/10/03 10:00	2019/10/03 10:05		
COC Number		2 OF 4	2 OF 4	2 OF 4	2 OF 4	2 OF 4		
	UNITS	**SS19-13**	**SS19-14**	**SS19-15**	**SS19-16**	**SS19-17**	**RDL**	**QC Batch**
Polycyclic Aromatics								
Index of Additive Cancer Risk(IACR)	N/A	0.19	0.17	0.23	<0.10	<0.10	0.10	9620342
Acenaphthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9622657
B[a]P TPE Total Potency Equivalents	mg/kg	0.0090	0.0090	0.010	<0.0071	<0.0071	0.0071	9620343
Acenaphthylene	mg/kg	0.013 (1)	0.015 (1)	0.0092 (1)	0.011 (1)	0.011 (1)	0.0050	9622657
Acridine	mg/kg	0.015	0.019	0.016	0.017	0.025	0.010	9622657
Anthracene	mg/kg	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.0040	9622657
Benzo(a)anthracene	mg/kg	0.018	0.014	0.012	<0.0050	0.0073	0.0050	9622657
Benzo(b&j)fluoranthene	mg/kg	0.015	0.014	0.024	<0.0050	<0.0050	0.0050	9622657
Benzo(k)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9622657
Benzo(g,h,i)perylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9622657
Benzo(c)phenanthrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9622657
Benzo(a)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9622657
Benzo(e)pyrene	mg/kg	0.0082	0.0078	0.013	<0.0050	<0.0050	0.0050	9622657
Chrysene	mg/kg	0.021	0.021	0.020	0.0085	0.0087	0.0050	9622657
Dibenz(a,h)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9622657
Fluoranthene	mg/kg	0.091	0.083	0.068	0.040	0.046	0.0050	9622657
Fluorene	mg/kg	0.0075 (1)	0.0090 (1)	<0.0050	<0.0050	0.0087 (1)	0.0050	9622657
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	<0.0050	0.0090	<0.0050	<0.0050	0.0050	9622657
2-Methylnaphthalene	mg/kg	0.15	0.23	0.12	0.26	0.29	0.0050	9622657
Naphthalene	mg/kg	0.051	0.098	0.041	0.084	0.11	0.0050	9622657
Phenanthrene	mg/kg	0.093	0.12	0.065	0.063	0.082	0.0050	9622657
Perylene	mg/kg	0.013	0.014	0.013	0.013	0.011	0.0050	9622657
Pyrene	mg/kg	0.13	0.099	0.080	0.052	0.068	0.0050	9622657
Quinoline	mg/kg	<0.010	<0.010	<0.010	<0.010	0.20	0.010	9622657
Low Molecular Weight PAH`s	mg/kg	0.33	0.49	0.25	0.43	0.73	0.010	9620345
High Molecular Weight PAH`s	mg/kg	0.27	0.23	0.21	0.10	0.13	0.0050	9620345
Total PAH	mg/kg	0.60	0.72	0.47	0.53	0.86	0.010	9620345
Surrogate Recovery (%)								
D10-ANTHRACENE (sur.)	%	77	77	79	80	68		9622657
D8-ACENAPHTHYLENE (sur.)	%	77	77	79	80	69		9622657
D8-NAPHTHALENE (sur.)	%	72	74	73	74	69		9622657

RDL = Reportable Detection Limit
(1) Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.

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BV Labs Job #: B986155
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DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ8981	WQ8982	WQ8983	WQ8984	WQ8985		
Sampling Date		2019/10/03 09:30	2019/10/03 09:35	2019/10/03 09:50	2019/10/03 10:00	2019/10/03 10:05		
COC Number		2 OF 4	2 OF 4	2 OF 4	2 OF 4	2 OF 4		
	UNITS	**SS19-13**	**SS19-14**	**SS19-15**	**SS19-16**	**SS19-17**	**RDL**	**QC Batch**
TERPHENYL-D14 (sur.)	%	77	76	79	78	69		9622657
RDL = Reportable Detection Limit								

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ8986		WQ8987	WQ8988			WQ8988		
Sampling Date		2019/10/03 10:15		2019/10/03 10:25	2019/10/03 10:35			2019/10/03 10:35		
COC Number		2 OF 4		2 OF 4	2 OF 4			2 OF 4		
	UNITS	**SS19-18**	**RDL**	**SS19-19**	**SS19-20**	**RDL**	**QC Batch**	**SS19-20 Lab-Dup**	**RDL**	**QC Batch**
Polycyclic Aromatics										
Index of Additive Cancer Risk(IACR)	N/A	1.9	0.10	0.16	0.40	0.10	9620342			
Acenaphthene	mg/kg	0.24 (1)	0.0050	0.0087	<0.0050	0.0050	9622657	<0.0050	0.0050	9622657
B[a]P TPE Total Potency Equivalents	mg/kg	0.14	0.0071	0.0080	0.019	0.0071	9620343			
Acenaphthylene	mg/kg	0.027	0.0050	0.016 (1)	0.018	0.0050	9622657	0.017	0.0050	9622657
Acridine	mg/kg	0.38	0.010	0.021	0.022 (2)	0.010	9622657	<0.010	0.010	9622657
Anthracene	mg/kg	0.029	0.0040	0.0067	0.0074	0.0040	9622657	0.0067	0.0040	9622657
Benzo(a)anthracene	mg/kg	0.12	0.0050	0.013	0.020	0.0050	9622657	0.014	0.0050	9622657
Benzo(b&j)fluoranthene	mg/kg	0.16	0.0050	0.013	0.037 (2)	0.0050	9622657	0.036	0.0050	9622657
Benzo(k)fluoranthene	mg/kg	0.016	0.0050	<0.0050	0.0088 (2)	0.0050	9622657	0.011	0.0050	9622657
Benzo(g,h,i)perylene	mg/kg	0.059	0.0050	<0.0050	0.010 (2)	0.0050	9622657	0.011	0.0050	9622657
Benzo(c)phenanthrene	mg/kg	0.013	0.0050	<0.0050	<0.0050	0.0050	9622657	<0.0050	0.0050	9622657
Benzo(a)pyrene	mg/kg	0.063	0.0050	<0.0050	0.0084 (2)	0.0050	9622657	0.011	0.0050	9622657
Benzo(e)pyrene	mg/kg	0.16	0.0050	<0.0050	0.021 (2)	0.0050	9622657	0.019	0.0050	9622657
Chrysene	mg/kg	0.22	0.0050	0.025	0.030 (2)	0.0050	9622657	0.045	0.0050	9622657
Dibenz(a,h)anthracene	mg/kg	0.039	0.0050	<0.0050	<0.0050 (2)	0.0050	9622657	<0.0050	0.0050	9622657
Fluoranthene	mg/kg	0.088	0.0050	0.075	0.12	0.0050	9622657	0.075	0.0050	9622657
Fluorene	mg/kg	0.30	0.0050	0.0093 (1)	0.0093 (1)	0.0050	9622657	0.0075	0.0050	9622657
Indeno(1,2,3-cd)pyrene	mg/kg	0.022	0.0050	<0.0050	0.011 (2)	0.0050	9622657	0.013	0.0050	9622657
2-Methylnaphthalene	mg/kg	10 (3)	0.050	0.37	0.25	0.0050	9622657	0.22	0.0050	9622657
Naphthalene	mg/kg	2.2	0.0050	0.12	0.11	0.0050	9622657	0.10	0.0050	9622657
Phenanthrene	mg/kg	2.1	0.0050	0.13	0.12	0.0050	9622657	0.091	0.0050	9622657
Perylene	mg/kg	<0.0050	0.0050	0.0096	0.012 (2)	0.0050	9622657	<0.0050	0.0050	9622657
Pyrene	mg/kg	0.18	0.0050	0.086	0.13	0.0050	9622657	0.087	0.0050	9622657
Quinoline	mg/kg	0.083	0.010	<0.010	<0.010	0.010	9622657	<0.010	0.010	9622657
Low Molecular Weight PAH`s	mg/kg	15	0.050	0.69	0.54	0.010	9620345			
High Molecular Weight PAH`s	mg/kg	0.98	0.0050	0.21	0.37	0.0050	9620345			
Total PAH	mg/kg	16	0.050	0.90	0.91	0.010	9620345			
Surrogate Recovery (%)										
D10-ANTHRACENE (sur.)	%	78		76	68		9622657	65		9622657

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
(1) Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.
(2) Matrix spike exceeds acceptance limits due to probable matrix interference.
(3) Detection limits raised due to dilution to bring analyte within the calibrated range.

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ8986		WQ8987	WQ8988			WQ8988		
Sampling Date		2019/10/03 10:15		2019/10/03 10:25	2019/10/03 10:35			2019/10/03 10:35		
COC Number		2 OF 4		2 OF 4	2 OF 4			2 OF 4		
	UNITS	**SS19-18**	**RDL**	**SS19-19**	**SS19-20**	**RDL**	**QC Batch**	**SS19-20 Lab-Dup**	**RDL**	**QC Batch**
D8-ACENAPHTHYLENE (sur.)	%	83		76	70		9622657	65		9622657
D8-NAPHTHALENE (sur.)	%	81		72	72		9622657	66		9622657
TERPHENYL-D14 (sur.)	%	71		75	71		9622657	75		9622657

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ8993		WQ8994	WQ8995	WQ8996	WQ8997		
Sampling Date		2019/10/03 10:45		2019/10/03 10:50	2019/10/03 10:55	2019/10/03 11:00	2019/10/03 11:05		
COC Number		3 OF 4		3 OF 4	3 OF 4	3 OF 4	3 OF 4		
	UNITS	**SS19-21**	**QC Batch**	**SS19-22**	**SS19-23**	**SS19-24**	**SS19-25**	**RDL**	**QC Batch**
Polycyclic Aromatics									
Index of Additive Cancer Risk(IACR)	N/A	<0.10	9620342	0.13	<0.10	0.15	<0.10	0.10	9621489
Acenaphthene	mg/kg	0.015 (1)	9622668	<0.0050	0.0093 (1)	0.0087 (1)	<0.0050	0.0050	9622668
B[a]P TPE Total Potency Equivalents	mg/kg	<0.0071	9620343	0.0080	<0.0071	0.0080	<0.0071	0.0071	9621493
Acenaphthylene	mg/kg	0.029 (1)	9622668	0.032 (1)	0.031 (1)	0.036 (1)	0.011 (1)	0.0050	9622668
Acridine	mg/kg	0.025	9622668	0.039	0.026	0.028	0.017	0.010	9622668
Anthracene	mg/kg	<0.0040	9622668	<0.0040	<0.0040	<0.0040	<0.0040	0.0040	9622668
Benzo(a)anthracene	mg/kg	0.0093	9622668	0.012	0.0075	0.015	<0.0050	0.0050	9622668
Benzo(b&j)fluoranthene	mg/kg	<0.0050	9622668	0.0076	<0.0050	0.0084	<0.0050	0.0050	9622668
Benzo(k)fluoranthene	mg/kg	<0.0050	9622668	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9622668
Benzo(g,h,i)perylene	mg/kg	<0.0050	9622668	0.0089	<0.0050	<0.0050	<0.0050	0.0050	9622668
Benzo(c)phenanthrene	mg/kg	0.0086	9622668	0.012	0.0078	0.012	<0.0050	0.0050	9622668
Benzo(a)pyrene	mg/kg	<0.0050	9622668	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9622668
Benzo(e)pyrene	mg/kg	<0.0050	9622668	<0.0050	<0.0050	<0.0050	0.010	0.0050	9622668
Chrysene	mg/kg	0.028	9622668	0.022	0.015	0.026	0.014	0.0050	9622668
Dibenz(a,h)anthracene	mg/kg	<0.0050	9622668	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9622668
Fluoranthene	mg/kg	0.081	9622668	0.10	0.068	0.095	0.039	0.0050	9622668
Fluorene	mg/kg	0.019 (1)	9622668	0.015 (1)	0.014 (1)	0.015 (1)	<0.0050	0.0050	9622668
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	9622668	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9622668
2-Methylnaphthalene	mg/kg	1.0	9622668	0.33	0.36	0.32	0.076	0.0050	9622668
Naphthalene	mg/kg	0.17	9622668	0.16	0.18	0.15	0.025	0.0050	9622668
Phenanthrene	mg/kg	0.20	9622668	0.14	0.10	0.12	0.051	0.0050	9622668
Perylene	mg/kg	0.010	9622668	0.011	0.012	0.016	0.0083	0.0050	9622668
Pyrene	mg/kg	0.12	9622668	0.13	0.12	0.17	0.052	0.0050	9622668
Quinoline	mg/kg	<0.010	9622668	<0.010	<0.010	<0.010	<0.010	0.010	9622668
Low Molecular Weight PAH`s	mg/kg	1.5	9620345	0.71	0.72	0.68	0.18	0.010	9621500
High Molecular Weight PAH`s	mg/kg	0.25	9620345	0.29	0.22	0.32	0.11	0.0050	9621500
Total PAH	mg/kg	1.7	9620345	1.0	0.94	1.0	0.29	0.010	9621500
Surrogate Recovery (%)									
D10-ANTHRACENE (sur.)	%	72	9622668	68	75	70	82		9622668
D8-ACENAPHTHYLENE (sur.)	%	75	9622668	72	79	75	83		9622668
D8-NAPHTHALENE (sur.)	%	75	9622668	73	76	74	76		9622668

RDL = Reportable Detection Limit
(1) Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ8993		WQ8994	WQ8995	WQ8996	WQ8997		
Sampling Date		2019/10/03 10:45		2019/10/03 10:50	2019/10/03 10:55	2019/10/03 11:00	2019/10/03 11:05		
COC Number		3 OF 4		3 OF 4	3 OF 4	3 OF 4	3 OF 4		
	UNITS	**SS19-21**	**QC Batch**	**SS19-22**	**SS19-23**	**SS19-24**	**SS19-25**	**RDL**	**QC Batch**
TERPHENYL-D14 (sur.)	%	69	9622668	69	72	70	73		9622668
RDL = Reportable Detection Limit									

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ8998	WQ8999	WQ9000	WQ9002		WQ9004		
Sampling Date		2019/10/03 11:10	2019/10/03 11:20	2019/10/03 11:30	2019/10/03 15:00		2019/10/03 15:15		
COC Number		3 OF 4	3 OF 4	3 OF 4	3 OF 4		4 OF 4		
	UNITS	**SS19-26**	**SS19-27**	**SS19-28**	**SS19-30**	**RDL**	**SS19-31**	**RDL**	**QC Batch**
Polycyclic Aromatics									
Index of Additive Cancer Risk(IACR)	N/A	0.31	0.25	0.16	<0.10	0.10	0.11	0.10	9621489
Acenaphthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	<0.0095 (1)	0.0095	9622668
B[a]P TPE Total Potency Equivalents	mg/kg	0.023	0.019	0.012	<0.0071	0.0071	<0.014	0.014	9621493
Acenaphthylene	mg/kg	0.026 (2)	0.018 (2)	0.0079 (2)	<0.0050	0.0050	<0.0095 (1)	0.0095	9622668
Acridine	mg/kg	0.025	0.019	<0.010	<0.010	0.010	<0.019 (1)	0.019	9622668
Anthracene	mg/kg	0.011	0.0061	<0.0040	<0.0040	0.0040	<0.0076 (1)	0.0076	9622668
Benzo(a)anthracene	mg/kg	0.026	0.022	0.010	<0.0050	0.0050	<0.0095 (1)	0.0095	9622668
Benzo(b&j)fluoranthene	mg/kg	0.023	0.017	0.011	<0.0050	0.0050	<0.0095 (1)	0.0095	9622668
Benzo(k)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	<0.0095 (1)	0.0095	9622668
Benzo(g,h,i)perylene	mg/kg	0.010	<0.0050	<0.0050	<0.0050	0.0050	<0.0095 (1)	0.0095	9622668
Benzo(c)phenanthrene	mg/kg	0.014	0.011	<0.0050	<0.0050	0.0050	<0.0095 (1)	0.0095	9622668
Benzo(a)pyrene	mg/kg	0.015	0.012	0.0071	<0.0050	0.0050	<0.0095 (1)	0.0095	9622668
Benzo(e)pyrene	mg/kg	0.018	0.017	<0.0050	<0.0050	0.0050	<0.0095 (1)	0.0095	9622668
Chrysene	mg/kg	0.038	0.030	0.015	<0.0050	0.0050	<0.0095 (1)	0.0095	9622668
Dibenz(a,h)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	<0.0095 (1)	0.0095	9622668
Fluoranthene	mg/kg	0.10	0.078	0.040	<0.0050	0.0050	<0.0095 (1)	0.0095	9622668
Fluorene	mg/kg	0.012 (2)	0.0093 (2)	<0.0050	<0.0050	0.0050	<0.0095 (1)	0.0095	9622668
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	<0.0095 (1)	0.0095	9622668
2-Methylnaphthalene	mg/kg	0.28	0.17	0.047	<0.0050	0.0050	<0.0095 (1)	0.0095	9622668
Naphthalene	mg/kg	0.14	0.079	0.017	<0.0050	0.0050	<0.0095 (1)	0.0095	9622668
Phenanthrene	mg/kg	0.14	0.094	0.040	<0.0050	0.0050	<0.0095 (1)	0.0095	9622668
Perylene	mg/kg	0.021	0.017	0.0075	<0.0050	0.0050	<0.0095 (1)	0.0095	9622668
Pyrene	mg/kg	0.14	0.12	0.047	<0.0050	0.0050	<0.0095 (1)	0.0095	9622668
Quinoline	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	<0.019 (1)	0.019	9622668
Low Molecular Weight PAH`s	mg/kg	0.64	0.39	0.11	<0.010	0.010	<0.019	0.019	9621500
High Molecular Weight PAH`s	mg/kg	0.37	0.29	0.13	<0.0050	0.0050	<0.0095	0.0095	9621500
Total PAH	mg/kg	1.0	0.68	0.24	<0.010	0.010	<0.019	0.019	9621500
Surrogate Recovery (%)									
D10-ANTHRACENE (sur.)	%	65	75	82	87		90		9622668
D8-ACENAPHTHYLENE (sur.)	%	68	79	82	86		89		9622668
D8-NAPHTHALENE (sur.)	%	68	74	77	80		82		9622668

RDL = Reportable Detection Limit
(1) Detection limits raised due to high moisture content, sample contains => 50% moisture.
(2) Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ8998	WQ8999	WQ9000	WQ9002		WQ9004		
Sampling Date		2019/10/03 11:10	2019/10/03 11:20	2019/10/03 11:30	2019/10/03 15:00		2019/10/03 15:15		
COC Number		3 OF 4	3 OF 4	3 OF 4	3 OF 4		4 OF 4		
	UNITS	**SS19-26**	**SS19-27**	**SS19-28**	**SS19-30**	**RDL**	**SS19-31**	**RDL**	**QC Batch**
TERPHENYL-D14 (sur.)	%	65	71	73	73		75		9622668
RDL = Reportable Detection Limit									

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BV Labs Job #: B986155
Report Date: 2019/10/29

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Client Project #: 19-1615
Sampler Initials: STC

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ9005	WQ9006			WQ9006		
Sampling Date		2019/10/03 15:30	2019/10/03 15:40			2019/10/03 15:40		
COC Number		4 OF 4	4 OF 4			4 OF 4		
	UNITS	**SS19-32**	**SS19-33**	**RDL**	**QC Batch**	**SS19-33 Lab-Dup**	**RDL**	**QC Batch**
Polycyclic Aromatics								
Index of Additive Cancer Risk(IACR)	N/A	<0.10	<0.10	0.10	9621489			
Acenaphthene	mg/kg	<0.0050	<0.0050	0.0050	9622668	<0.0050	0.0050	9622668
B[a]P TPE Total Potency Equivalents	mg/kg	<0.0071	<0.0071	0.0071	9621493			
Acenaphthylene	mg/kg	<0.0050	<0.0050	0.0050	9622668	<0.0050	0.0050	9622668
Acridine	mg/kg	<0.010	<0.010	0.010	9622668	<0.010	0.010	9622668
Anthracene	mg/kg	<0.0040	<0.0040	0.0040	9622668	<0.0040	0.0040	9622668
Benzo(a)anthracene	mg/kg	<0.0050	<0.0050	0.0050	9622668	<0.0050	0.0050	9622668
Benzo(b&j)fluoranthene	mg/kg	<0.0050	<0.0050	0.0050	9622668	<0.0050	0.0050	9622668
Benzo(k)fluoranthene	mg/kg	<0.0050	<0.0050	0.0050	9622668	<0.0050	0.0050	9622668
Benzo(g,h,i)perylene	mg/kg	<0.0050	<0.0050	0.0050	9622668	<0.0050	0.0050	9622668
Benzo(c)phenanthrene	mg/kg	<0.0050	<0.0050	0.0050	9622668	<0.0050	0.0050	9622668
Benzo(a)pyrene	mg/kg	<0.0050	<0.0050	0.0050	9622668	<0.0050	0.0050	9622668
Benzo(e)pyrene	mg/kg	<0.0050	<0.0050	0.0050	9622668	<0.0050	0.0050	9622668
Chrysene	mg/kg	<0.0050	<0.0050	0.0050	9622668	<0.0050	0.0050	9622668
Dibenz(a,h)anthracene	mg/kg	<0.0050	<0.0050	0.0050	9622668	<0.0050	0.0050	9622668
Fluoranthene	mg/kg	<0.0050	<0.0050	0.0050	9622668	<0.0050	0.0050	9622668
Fluorene	mg/kg	<0.0050	<0.0050	0.0050	9622668	<0.0050	0.0050	9622668
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	<0.0050	0.0050	9622668	<0.0050	0.0050	9622668
2-Methylnaphthalene	mg/kg	<0.0050	<0.0050	0.0050	9622668	<0.0050	0.0050	9622668
Naphthalene	mg/kg	<0.0050	<0.0050	0.0050	9622668	<0.0050	0.0050	9622668
Phenanthrene	mg/kg	<0.0050	<0.0050	0.0050	9622668	<0.0050	0.0050	9622668
Perylene	mg/kg	<0.0050	<0.0050	0.0050	9622668	<0.0050	0.0050	9622668
Pyrene	mg/kg	<0.0050	<0.0050	0.0050	9622668	<0.0050	0.0050	9622668
Quinoline	mg/kg	<0.010	<0.010	0.010	9622668	<0.010	0.010	9622668
Low Molecular Weight PAH`s	mg/kg	<0.010	<0.010	0.010	9621500			
High Molecular Weight PAH`s	mg/kg	<0.0050	<0.0050	0.0050	9621500			
Total PAH	mg/kg	<0.010	<0.010	0.010	9621500			
Surrogate Recovery (%)								
D10-ANTHRACENE (sur.)	%	86	84		9622668	86		9622668
D8-ACENAPHTHYLENE (sur.)	%	84	81		9622668	84		9622668
D8-NAPHTHALENE (sur.)	%	79	78		9622668	79		9622668

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ9005	WQ9006			WQ9006		
Sampling Date		2019/10/03 15:30	2019/10/03 15:40			2019/10/03 15:40		
COC Number		4 OF 4	4 OF 4			4 OF 4		
	UNITS	**SS19-32**	**SS19-33**	**RDL**	**QC Batch**	**SS19-33 Lab-Dup**	**RDL**	**QC Batch**
TERPHENYL-D14 (sur.)	%	73	71		9622668	72		9622668

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

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BV Labs Job #: B986155
Report Date: 2019/10/29

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		WQ8967	WQ8968	WQ8969	WQ8970	WQ8971	WQ8972		
Sampling Date		2019/10/02 12:30	2019/10/02 12:35	2019/10/02 12:45	2019/10/02 13:00	2019/10/02 13:10	2019/10/02 13:20		
COC Number		1 OF 4	1 OF 4	1 OF 4	1 OF 4	1 OF 4	1 OF 4		
	UNITS	**SS19-01**	**SS19-02**	**SS19-03**	**SS19-04**	**SS19-05**	**SS19-06**	**RDL**	**QC Batch**
Elements									
Total Aluminum (Al)	mg/kg	2600	2600	2800	2000	2800	2600	250	9624564
Total Antimony (Sb)	mg/kg	<1.3	<1.3	<1.3	1.4	<1.3	<1.3	1.3	9624564
Total Arsenic (As)	mg/kg	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	2.5	9624564
Total Barium (Ba)	mg/kg	450	420	440	210	430	370	2.5	9624564
Total Beryllium (Be)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	9624564
Total Boron (B)	mg/kg	44	43	49	24	58	38	2.0	9624564
Total Cadmium (Cd)	mg/kg	<0.13	<0.13	0.20	0.22	0.66	0.35	0.13	9624564
Total Chromium (Cr)	mg/kg	<2.5	<2.5	<2.5	3.8	3.7	3.0	2.5	9624564
Total Cobalt (Co)	mg/kg	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	1.3	9624564
Total Copper (Cu)	mg/kg	25	59	7.9	13	45	21	2.5	9624564
Total Iron (Fe)	mg/kg	2600	2700	2700	4100	3100	3300	250	9624564
Total Lead (Pb)	mg/kg	18	20	24	19	62	53	1.3	9624564
Total Magnesium (Mg)	mg/kg	4500	5000	3600	21000	3000	8100	130	9624564
Total Manganese (Mn)	mg/kg	41	42	41	90	53	57	2.5	9624564
Total Mercury (Hg)	mg/kg	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	0.13	9624564
Total Molybdenum (Mo)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	9624564
Total Nickel (Ni)	mg/kg	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	2.5	9624564
Total Selenium (Se)	mg/kg	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	1.3	9624564
Total Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	9624564
Total Thallium (Tl)	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0.25	9624564
Total Tin (Sn)	mg/kg	<2.5	5.0	<2.5	<2.5	<2.5	<2.5	2.5	9624564
Total Uranium (U)	mg/kg	0.81	0.83	0.82	0.63	0.85	0.87	0.50	9624564
Total Vanadium (V)	mg/kg	3.5	4.1	3.4	4.9	3.5	4.1	2.5	9624564
Total Zinc (Zn)	mg/kg	<25	<25	34	67	46	99	25	9624564
RDL = Reportable Detection Limit									

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		WQ8973	WQ8974		WQ8975	WQ8976	WQ8979	WQ8980		
Sampling Date		2019/10/02 13:35	2019/10/02 13:45		2019/10/02 14:00	2019/10/02 14:15	2019/10/02 14:30	2019/10/02 14:45		
COC Number		1 OF 4	1 OF 4		1 OF 4	1 OF 4	2 OF 4	2 OF 4		
	UNITS	**SS19-07**	**SS19-08**	**QC Batch**	**SS19-09**	**SS19-10**	**SS19-11**	**SS19-12**	**RDL**	**QC Batch**
Elements										
Total Aluminum (Al)	mg/kg	2600	2300	9624891	2100	2900	2600	2800	250	9624564
Total Antimony (Sb)	mg/kg	<1.3	<1.3	9624891	<1.3	<1.3	<1.3	<1.3	1.3	9624564
Total Arsenic (As)	mg/kg	<2.5	<2.5	9624891	<2.5	<2.5	<2.5	4.0	2.5	9624564
Total Barium (Ba)	mg/kg	470	320	9624891	200	470	260	430	2.5	9624564
Total Beryllium (Be)	mg/kg	<1.0	<1.0	9624891	<1.0	<1.0	<1.0	<1.0	1.0	9624564
Total Boron (B)	mg/kg	48	32	9624891	35	46	33	37	2.0	9624564
Total Cadmium (Cd)	mg/kg	0.19	<0.13	9624891	<0.13	0.16	0.43	0.31	0.13	9624564
Total Chromium (Cr)	mg/kg	3.9	2.7	9624891	3.2	3.2	4.7	3.1	2.5	9624564
Total Cobalt (Co)	mg/kg	<1.3	<1.3	9624891	<1.3	<1.3	<1.3	1.5	1.3	9624564
Total Copper (Cu)	mg/kg	23	3.3	9624891	<2.5	12	8.8	8.8	2.5	9624564
Total Iron (Fe)	mg/kg	3100	3400	9624891	3900	4700	6800	9300	250	9624564
Total Lead (Pb)	mg/kg	16	19	9624891	13	28	32	23	1.3	9624564
Total Magnesium (Mg)	mg/kg	3000	9500	9624891	20000	3000	19000	2300	130	9624564
Total Manganese (Mn)	mg/kg	39	69	9624891	90	62	130	55	2.5	9624564
Total Mercury (Hg)	mg/kg	<0.13	<0.13	9624891	<0.13	<0.13	<0.13	<0.13	0.13	9624564
Total Molybdenum (Mo)	mg/kg	<1.0	<1.0	9624891	<1.0	<1.0	<1.0	<1.0	1.0	9624564
Total Nickel (Ni)	mg/kg	<2.5	<2.5	9624891	<2.5	<2.5	2.8	<2.5	2.5	9624564
Total Selenium (Se)	mg/kg	<1.3	<1.3	9624891	<1.3	<1.3	<1.3	<1.3	1.3	9624564
Total Silver (Ag)	mg/kg	<0.50	<0.50	9624891	<0.50	0.65	<0.50	<0.50	0.50	9624564
Total Thallium (Tl)	mg/kg	<0.25	<0.25	9624891	<0.25	<0.25	<0.25	<0.25	0.25	9624564
Total Tin (Sn)	mg/kg	<2.5	<2.5	9624891	<2.5	<2.5	2.9	2.7	2.5	9624564
Total Uranium (U)	mg/kg	0.81	0.88	9624891	0.59	0.87	0.69	0.79	0.50	9624564
Total Vanadium (V)	mg/kg	3.2	4.2	9624891	5.2	3.9	5.0	3.4	2.5	9624564
Total Zinc (Zn)	mg/kg	46	25	9624891	<25	33	45	130	25	9624564
RDL = Reportable Detection Limit										

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		WQ8981	WQ8982	WQ8983	WQ8984		WQ8985		
Sampling Date		2019/10/03 09:30	2019/10/03 09:35	2019/10/03 09:50	2019/10/03 10:00		2019/10/03 10:05		
COC Number		2 OF 4	2 OF 4	2 OF 4	2 OF 4		2 OF 4		
	UNITS	**SS19-13**	**SS19-14**	**SS19-15**	**SS19-16**	**QC Batch**	**SS19-17**	**RDL**	**QC Batch**
Elements									
Total Aluminum (Al)	mg/kg	2200	2200	2800	2300	9624891	2700	250	9624564
Total Antimony (Sb)	mg/kg	<1.3	<1.3	<1.3	<1.3	9624891	<1.3	1.3	9624564
Total Arsenic (As)	mg/kg	<2.5	<2.5	<2.5	<2.5	9624891	<2.5	2.5	9624564
Total Barium (Ba)	mg/kg	440	430	450	420	9624891	400	2.5	9624564
Total Beryllium (Be)	mg/kg	<1.0	<1.0	<1.0	<1.0	9624891	<1.0	1.0	9624564
Total Boron (B)	mg/kg	36	35	49	27	9624891	36	2.0	9624564
Total Cadmium (Cd)	mg/kg	0.14	0.13	0.19	0.13	9624891	<0.13	0.13	9624564
Total Chromium (Cr)	mg/kg	<2.5	<2.5	2.6	<2.5	9624891	<2.5	2.5	9624564
Total Cobalt (Co)	mg/kg	<1.3	<1.3	2.2	<1.3	9624891	<1.3	1.3	9624564
Total Copper (Cu)	mg/kg	4.2	4.0	19	2.8	9624891	2.6	2.5	9624564
Total Iron (Fe)	mg/kg	3100	2800	3400	3400	9624891	4900	250	9624564
Total Lead (Pb)	mg/kg	14	14	28	15	9624891	22	1.3	9624564
Total Magnesium (Mg)	mg/kg	3400	3500	6300	5500	9624891	2800	130	9624564
Total Manganese (Mn)	mg/kg	56	44	59	83	9624891	86	2.5	9624564
Total Mercury (Hg)	mg/kg	<0.13	<0.13	<0.13	<0.13	9624891	<0.13	0.13	9624564
Total Molybdenum (Mo)	mg/kg	<1.0	<1.0	<1.0	<1.0	9624891	<1.0	1.0	9624564
Total Nickel (Ni)	mg/kg	<2.5	<2.5	<2.5	<2.5	9624891	<2.5	2.5	9624564
Total Selenium (Se)	mg/kg	<1.3	<1.3	<1.3	<1.3	9624891	<1.3	1.3	9624564
Total Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	9624891	<0.50	0.50	9624564
Total Thallium (Tl)	mg/kg	<0.25	<0.25	<0.25	<0.25	9624891	<0.25	0.25	9624564
Total Tin (Sn)	mg/kg	<2.5	<2.5	<2.5	<2.5	9624891	<2.5	2.5	9624564
Total Uranium (U)	mg/kg	0.82	0.76	0.87	1.0	9624891	1.0	0.50	9624564
Total Vanadium (V)	mg/kg	3.3	3.4	4.2	4.4	9624891	3.7	2.5	9624564
Total Zinc (Zn)	mg/kg	<25	<25	27	<25	9624891	<25	25	9624564
RDL = Reportable Detection Limit									

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		WQ8986		WQ8987		WQ8988	WQ8993		WQ8994		
Sampling Date		2019/10/03 10:15		2019/10/03 10:25		2019/10/03 10:35	2019/10/03 10:45		2019/10/03 10:50		
COC Number		2 OF 4		2 OF 4		2 OF 4	3 OF 4		3 OF 4		
	UNITS	**SS19-18**	**RDL**	**SS19-19**	**QC Batch**	**SS19-20**	**SS19-21**	**QC Batch**	**SS19-22**	**RDL**	**QC Batch**
Elements											
Total Aluminum (Al)	mg/kg	1400	100	2500	9624891	2500	3200	9624564	2600	250	9624891
Total Antimony (Sb)	mg/kg	<0.50	0.50	<1.3	9624891	<1.3	<1.3	9624564	<1.3	1.3	9624891
Total Arsenic (As)	mg/kg	5.5	1.0	<2.5	9624891	<2.5	<2.5	9624564	<2.5	2.5	9624891
Total Barium (Ba)	mg/kg	280	1.0	420	9624891	450	460	9624564	490	2.5	9624891
Total Beryllium (Be)	mg/kg	<0.40	0.40	<1.0	9624891	<1.0	<1.0	9624564	<1.0	1.0	9624891
Total Boron (B)	mg/kg	6.6	0.80	35	9624891	31	60	9624564	32	2.0	9624891
Total Cadmium (Cd)	mg/kg	0.093	0.050	0.27	9624891	0.18	<0.13	9624564	0.15	0.13	9624891
Total Chromium (Cr)	mg/kg	1.6	1.0	<2.5	9624891	<2.5	<2.5	9624564	3.9	2.5	9624891
Total Cobalt (Co)	mg/kg	0.55	0.50	<1.3	9624891	<1.3	<1.3	9624564	<1.3	1.3	9624891
Total Copper (Cu)	mg/kg	13	1.0	8.1	9624891	3.0	2.7	9624564	3.5	2.5	9624891
Total Iron (Fe)	mg/kg	6000	100	2200	9624891	2500	3000	9624564	2500	250	9624891
Total Lead (Pb)	mg/kg	8.5	0.50	23	9624891	18	29	9624564	13	1.3	9624891
Total Magnesium (Mg)	mg/kg	120	50	4300	9624891	3000	2000	9624564	1800	130	9624891
Total Manganese (Mn)	mg/kg	12	1.0	43	9624891	40	52	9624564	37	2.5	9624891
Total Mercury (Hg)	mg/kg	0.88	0.050	<0.13	9624891	<0.13	<0.13	9624564	<0.13	0.13	9624891
Total Molybdenum (Mo)	mg/kg	1.6	0.40	<1.0	9624891	<1.0	<1.0	9624564	<1.0	1.0	9624891
Total Nickel (Ni)	mg/kg	1.6	1.0	<2.5	9624891	<2.5	<2.5	9624564	<2.5	2.5	9624891
Total Selenium (Se)	mg/kg	0.86	0.50	<1.3	9624891	<1.3	<1.3	9624564	<1.3	1.3	9624891
Total Silver (Ag)	mg/kg	<0.20	0.20	<0.50	9624891	<0.50	<0.50	9624564	<0.50	0.50	9624891
Total Thallium (Tl)	mg/kg	0.47	0.10	<0.25	9624891	<0.25	<0.25	9624564	<0.25	0.25	9624891
Total Tin (Sn)	mg/kg	<1.0	1.0	<2.5	9624891	<2.5	<2.5	9624564	<2.5	2.5	9624891
Total Uranium (U)	mg/kg	0.35	0.20	0.83	9624891	0.99	1.1	9624564	0.78	0.50	9624891
Total Vanadium (V)	mg/kg	6.1	1.0	3.2	9624891	3.5	4.0	9624564	3.3	2.5	9624891
Total Zinc (Zn)	mg/kg	<10	10	31	9624891	<25	<25	9624564	<25	25	9624891
RDL = Reportable Detection Limit											

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		WQ8995	WQ8996	WQ8997	WQ8998		WQ8999		
Sampling Date		2019/10/03 10:55	2019/10/03 11:00	2019/10/03 11:05	2019/10/03 11:10		2019/10/03 11:20		
COC Number		3 OF 4	3 OF 4	3 OF 4	3 OF 4		3 OF 4		
	UNITS	**SS19-23**	**SS19-24**	**SS19-25**	**SS19-26**	**QC Batch**	**SS19-27**	**RDL**	**QC Batch**
Elements									
Total Aluminum (Al)	mg/kg	2400	2600	2000	2200	9624564	2400	250	9624891
Total Antimony (Sb)	mg/kg	<1.3	<1.3	<1.3	<1.3	9624564	2.6	1.3	9624891
Total Arsenic (As)	mg/kg	<2.5	<2.5	<2.5	<2.5	9624564	<2.5	2.5	9624891
Total Barium (Ba)	mg/kg	420	550	310	400	9624564	430	2.5	9624891
Total Beryllium (Be)	mg/kg	<1.0	<1.0	<1.0	<1.0	9624564	<1.0	1.0	9624891
Total Boron (B)	mg/kg	30	26	27	31	9624564	34	2.0	9624891
Total Cadmium (Cd)	mg/kg	<0.13	0.16	<0.13	<0.13	9624564	0.15	0.13	9624891
Total Chromium (Cr)	mg/kg	<2.5	<2.5	2.6	<2.5	9624564	<2.5	2.5	9624891
Total Cobalt (Co)	mg/kg	<1.3	<1.3	<1.3	<1.3	9624564	<1.3	1.3	9624891
Total Copper (Cu)	mg/kg	2.5	3.9	2.7	3.2	9624564	930	2.5	9624891
Total Iron (Fe)	mg/kg	3400	2600	3200	2400	9624564	2500	250	9624891
Total Lead (Pb)	mg/kg	14	25	10	15	9624564	31	1.3	9624891
Total Magnesium (Mg)	mg/kg	5700	3200	18000	2300	9624564	2900	130	9624891
Total Manganese (Mn)	mg/kg	60	61	90	50	9624564	48	2.5	9624891
Total Mercury (Hg)	mg/kg	<0.13	<0.13	<0.13	<0.13	9624564	<0.13	0.13	9624891
Total Molybdenum (Mo)	mg/kg	<1.0	<1.0	<1.0	<1.0	9624564	<1.0	1.0	9624891
Total Nickel (Ni)	mg/kg	<2.5	<2.5	<2.5	<2.5	9624564	<2.5	2.5	9624891
Total Selenium (Se)	mg/kg	<1.3	<1.3	<1.3	<1.3	9624564	<1.3	1.3	9624891
Total Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	9624564	<0.50	0.50	9624891
Total Thallium (Tl)	mg/kg	<0.25	<0.25	<0.25	<0.25	9624564	<0.25	0.25	9624891
Total Tin (Sn)	mg/kg	<2.5	<2.5	<2.5	<2.5	9624564	<2.5	2.5	9624891
Total Uranium (U)	mg/kg	0.77	0.85	0.61	0.74	9624564	0.81	0.50	9624891
Total Vanadium (V)	mg/kg	3.7	3.3	3.9	3.1	9624564	3.2	2.5	9624891
Total Zinc (Zn)	mg/kg	<25	<25	<25	<25	9624564	<25	25	9624891
RDL = Reportable Detection Limit									

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		WQ9000			WQ9001			WQ9002		WQ9004		
Sampling Date		2019/10/03 11:30			2019/10/03 11:45			2019/10/03 15:00		2019/10/03 15:15		
COC Number		3 OF 4			3 OF 4			3 OF 4		4 OF 4		
	UNITS	**SS19-28**	**RDL**	**QC Batch**	**SS19-29**	**RDL**	**QC Batch**	**SS19-30**	**QC Batch**	**SS19-31**	**RDL**	**QC Batch**
Elements												
Total Aluminum (Al)	mg/kg	2500	250	9624564	970	200	9624891	1200	9624564	1300	100	9624891
Total Antimony (Sb)	mg/kg	<1.3	1.3	9624564	<1.0	1.0	9624891	<0.50	9624564	<0.50	0.50	9624891
Total Arsenic (As)	mg/kg	<2.5	2.5	9624564	<2.0	2.0	9624891	1.2	9624564	1.4	1.0	9624891
Total Barium (Ba)	mg/kg	370	2.5	9624564	41	2.0	9624891	8.1	9624564	9.6	1.0	9624891
Total Beryllium (Be)	mg/kg	<1.0	1.0	9624564	<0.80	0.80	9624891	<0.40	9624564	<0.40	0.40	9624891
Total Boron (B)	mg/kg	32	2.0	9624564	34	1.6	9624891	14	9624564	14	0.80	9624891
Total Cadmium (Cd)	mg/kg	0.15	0.13	9624564	0.24	0.10	9624891	<0.050	9624564	<0.050	0.050	9624891
Total Chromium (Cr)	mg/kg	<2.5	2.5	9624564	5.6	2.0	9624891	3.7	9624564	3.6	1.0	9624891
Total Cobalt (Co)	mg/kg	<1.3	1.3	9624564	1.5	1.0	9624891	1.1	9624564	1.1	0.50	9624891
Total Copper (Cu)	mg/kg	4.6	2.5	9624564	19	2.0	9624891	1.6	9624564	1.7	1.0	9624891
Total Iron (Fe)	mg/kg	3000	250	9624564	17000	200	9624891	3400	9624564	3800	100	9624891
Total Lead (Pb)	mg/kg	24	1.3	9624564	17	1.0	9624891	3.6	9624564	5.2	0.50	9624891
Total Magnesium (Mg)	mg/kg	11000	130	9624564	2800	100	9624891	30000	9624564	31000	50	9624891
Total Manganese (Mn)	mg/kg	68	2.5	9624564	270	2.0	9624891	110	9624564	130	1.0	9624891
Total Mercury (Hg)	mg/kg	<0.13	0.13	9624564	0.22	0.10	9624891	<0.050	9624564	<0.050	0.050	9624891
Total Molybdenum (Mo)	mg/kg	<1.0	1.0	9624564	1.1	0.80	9624891	<0.40	9624564	<0.40	0.40	9624891
Total Nickel (Ni)	mg/kg	<2.5	2.5	9624564	7.0	2.0	9624891	2.4	9624564	2.6	1.0	9624891
Total Selenium (Se)	mg/kg	<1.3	1.3	9624564	<1.0	1.0	9624891	<0.50	9624564	<0.50	0.50	9624891
Total Silver (Ag)	mg/kg	<0.50	0.50	9624564	<0.40	0.40	9624891	<0.20	9624564	<0.20	0.20	9624891
Total Thallium (Tl)	mg/kg	<0.25	0.25	9624564	<0.20	0.20	9624891	<0.10	9624564	<0.10	0.10	9624891
Total Tin (Sn)	mg/kg	<2.5	2.5	9624564	23	2.0	9624891	<1.0	9624564	<1.0	1.0	9624891
Total Uranium (U)	mg/kg	0.85	0.50	9624564	2.5	0.40	9624891	0.38	9624564	0.38	0.20	9624891
Total Vanadium (V)	mg/kg	4.1	2.5	9624564	2.8	2.0	9624891	4.8	9624564	4.9	1.0	9624891
Total Zinc (Zn)	mg/kg	<25	25	9624564	27	20	9624891	<10	9624564	<10	10	9624891
RDL = Reportable Detection Limit												

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		WQ9005		WQ9006	WQ9006		
Sampling Date		2019/10/03 15:30		2019/10/03 15:40	2019/10/03 15:40		
COC Number		4 OF 4		4 OF 4	4 OF 4		
	UNITS	**SS19-32**	**QC Batch**	**SS19-33**	**SS19-33 Lab-Dup**	**RDL**	**QC Batch**
Elements							
Total Aluminum (Al)	mg/kg	2000	9624891	5300	5600	100	9624564
Total Antimony (Sb)	mg/kg	<0.50	9624891	<0.50	<0.50	0.50	9624564
Total Arsenic (As)	mg/kg	1.4	9624891	2.2	2.0	1.0	9624564
Total Barium (Ba)	mg/kg	14	9624891	39	41	1.0	9624564
Total Beryllium (Be)	mg/kg	<0.40	9624891	<0.40	<0.40	0.40	9624564
Total Boron (B)	mg/kg	15	9624891	15	15	0.80	9624564
Total Cadmium (Cd)	mg/kg	<0.050	9624891	<0.050	<0.050	0.050	9624564
Total Chromium (Cr)	mg/kg	5.8	9624891	17	18	1.0	9624564
Total Cobalt (Co)	mg/kg	1.5	9624891	3.7	3.9	0.50	9624564
Total Copper (Cu)	mg/kg	3.3	9624891	7.1	7.2	1.0	9624564
Total Iron (Fe)	mg/kg	4900	9624891	10000	10000	100	9624564
Total Lead (Pb)	mg/kg	2.6	9624891	5.0	4.3	0.50	9624564
Total Magnesium (Mg)	mg/kg	26000	9624891	27000	27000	50	9624564
Total Manganese (Mn)	mg/kg	95	9624891	180	180	1.0	9624564
Total Mercury (Hg)	mg/kg	<0.050	9624891	<0.050	<0.050	0.050	9624564
Total Molybdenum (Mo)	mg/kg	<0.40	9624891	0.41	0.41	0.40	9624564
Total Nickel (Ni)	mg/kg	3.5	9624891	9.9	10	1.0	9624564
Total Selenium (Se)	mg/kg	<0.50	9624891	<0.50	<0.50	0.50	9624564
Total Silver (Ag)	mg/kg	<0.20	9624891	<0.20	<0.20	0.20	9624564
Total Thallium (Tl)	mg/kg	<0.10	9624891	0.10	0.11	0.10	9624564
Total Tin (Sn)	mg/kg	<1.0	9624891	<1.0	<1.0	1.0	9624564
Total Uranium (U)	mg/kg	0.48	9624891	1.0	0.78	0.20	9624564
Total Vanadium (V)	mg/kg	7.8	9624891	19	19	1.0	9624564
Total Zinc (Zn)	mg/kg	<10	9624891	18	19	10	9624564

RDL = Reportable Detection Limit
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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

VOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ8967			WQ8967			WQ8968		WQ8969		
Sampling Date		2019/10/02 12:30			2019/10/02 12:30			2019/10/02 12:35		2019/10/02 12:45		
COC Number		1 OF 4			1 OF 4			1 OF 4		1 OF 4		
	UNITS	**SS19-01**	**RDL**	**QC Batch**	**SS19-01 Lab-Dup**	**RDL**	**QC Batch**	**SS19-02**	**RDL**	**SS19-03**	**RDL**	**QC Batch**
Volatiles												
Xylenes (Total)	mg/kg	0.48	0.11	9621142				0.49	0.10	0.42	0.095	9621142
F1 (C6-C10) - BTEX	mg/kg	<24	24	9621142				<23	23	<21	21	9621142
Field Preserved Volatiles												
Benzene	mg/kg	<0.012 (1)	0.012	9622589	<0.012	0.012	9622589	<0.012 (1)	0.012	0.078 (1)	0.011	9622589
Toluene	mg/kg	<0.080 (1)	0.080	9622589	<0.080	0.080	9622589	<0.080 (1)	0.080	0.14 (1)	0.11	9622589
Ethylbenzene	mg/kg	0.16 (1)	0.024	9622589	0.17	0.024	9622589	0.18 (1)	0.023	0.15 (1)	0.021	9622589
m & p-Xylene	mg/kg	0.31 (1)	0.096	9622589	0.31	0.096	9622589	0.30 (1)	0.093	0.29 (1)	0.085	9622589
o-Xylene	mg/kg	0.17 (1)	0.048	9622589	0.18	0.048	9622589	0.19 (1)	0.047	0.13 (1)	0.042	9622589
F1 (C6-C10)	mg/kg	<24 (1)	24	9622589	<24	24	9622589	<23 (1)	23	<21 (1)	21	9622589
Surrogate Recovery (%)												
1,4-Difluorobenzene (sur.)	%	94		9622589	94		9622589	95		94		9622589
4-Bromofluorobenzene (sur.)	%	102		9622589	103		9622589	104		100		9622589
D10-o-Xylene (sur.)	%	89		9622589	92		9622589	85		84		9622589
D4-1,2-Dichloroethane (sur.)	%	84		9622589	83		9622589	85		86		9622589

RDL = Reportable Detection Limit
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(1) Detection limits raised based on sample weight used for analysis.

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

VOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ8970		WQ8971		WQ8972		WQ8973		
Sampling Date		2019/10/02 13:00		2019/10/02 13:10		2019/10/02 13:20		2019/10/02 13:35		
COC Number		1 OF 4		1 OF 4		1 OF 4		1 OF 4		
	UNITS	**SS19-04**	**RDL**	**SS19-05**	**RDL**	**SS19-06**	**RDL**	**SS19-07**	**RDL**	**QC Batch**
Volatiles										
Xylenes (Total)	mg/kg	0.14	0.045	0.77	0.11	0.39	0.11	0.64	0.093	9621142
F1 (C6-C10) - BTEX	mg/kg	<10	10	<24	24	<24	24	<21	21	9621142
Field Preserved Volatiles										
Benzene	mg/kg	<0.0050	0.0050	<0.012 (1)	0.012	<0.012 (1)	0.012	0.018 (1)	0.010	9622589
Toluene	mg/kg	<0.050	0.050	<0.080 (1)	0.080	<0.080 (1)	0.080	<0.080 (1)	0.080	9622589
Ethylbenzene	mg/kg	0.056	0.010	0.33 (1)	0.025	0.15 (1)	0.025	0.25 (1)	0.021	9622589
m & p-Xylene	mg/kg	0.089	0.040	0.51 (1)	0.10	0.26 (1)	0.099	0.41 (1)	0.083	9622589
o-Xylene	mg/kg	0.050	0.020	0.27 (1)	0.050	0.13 (1)	0.049	0.22 (1)	0.042	9622589
F1 (C6-C10)	mg/kg	<10	10	<24 (1)	24	<24 (1)	24	<21 (1)	21	9622589
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	95		94		93		93		9622589
4-Bromofluorobenzene (sur.)	%	101		104		101		101		9622589
D10-o-Xylene (sur.)	%	92		86		90		83		9622589
D4-1,2-Dichloroethane (sur.)	%	84		84		85		84		9622589

RDL = Reportable Detection Limit
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Sampler Initials: STC

VOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ8974		WQ8975		WQ8976		WQ8979		
Sampling Date		2019/10/02 13:45		2019/10/02 14:00		2019/10/02 14:15		2019/10/02 14:30		
COC Number		1 OF 4		1 OF 4		1 OF 4		2 OF 4		
	UNITS	**SS19-08**	**RDL**	**SS19-09**	**RDL**	**SS19-10**	**RDL**	**SS19-11**	**RDL**	**QC Batch**
Volatiles										
Xylenes (Total)	mg/kg	0.24	0.095	0.95	0.10	0.99	0.12	0.28	0.091	9621142
F1 (C6-C10) - BTEX	mg/kg	<21	21	<23	23	<24	24	<20	20	9621142
Field Preserved Volatiles										
Benzene	mg/kg	<0.011 (1)	0.011	<0.011 (1)	0.011	0.025 (1)	0.013	<0.010 (1)	0.010	9622589
Toluene	mg/kg	<0.080 (1)	0.080	<0.080 (1)	0.080	<0.090 (1)	0.090	0.10 (1)	0.10	9622589
Ethylbenzene	mg/kg	0.091 (1)	0.021	0.35 (1)	0.023	0.44 (1)	0.026	0.099 (1)	0.020	9622589
m & p-Xylene	mg/kg	0.15 (1)	0.085	0.61 (1)	0.091	0.64 (1)	0.11	0.19 (1)	0.081	9622589
o-Xylene	mg/kg	0.086 (1)	0.043	0.34 (1)	0.045	0.35 (1)	0.053	0.092 (1)	0.041	9622589
F1 (C6-C10)	mg/kg	<21 (1)	21	<23 (1)	23	<24 (1)	24	<20 (1)	20	9622589
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	95		94		94		95		9622589
4-Bromofluorobenzene (sur.)	%	109		101		100		102		9622589
D10-o-Xylene (sur.)	%	87		89		83		88		9622589
D4-1,2-Dichloroethane (sur.)	%	84		84		86		84		9622589

RDL = Reportable Detection Limit
(1) Detection limits raised based on sample weight used for analysis.

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Client Project #: 19-1615
Sampler Initials: STC

VOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ8980			WQ8981		WQ8982		WQ8983		
Sampling Date		2019/10/02 14:45			2019/10/03 09:30		2019/10/03 09:35		2019/10/03 09:50		
COC Number		2 OF 4			2 OF 4		2 OF 4		2 OF 4		
	UNITS	**SS19-12**	**RDL**	**QC Batch**	**SS19-13**	**RDL**	**SS19-14**	**RDL**	**SS19-15**	**RDL**	**QC Batch**
Volatiles											
Benzene	mg/kg	0.019	0.0050	9624542							
Toluene	mg/kg	0.093	0.050	9624542							
Ethylbenzene	mg/kg	0.47	0.010	9624542							
m & p-Xylene	mg/kg	0.68	0.040	9624542							
o-Xylene	mg/kg	0.34	0.020	9624542							
Xylenes (Total)	mg/kg	1.0	0.045	9621142	1.1	0.11	1.2	0.13	0.41	0.10	9621142
F1 (C6-C10) - BTEX	mg/kg	17	10	9621142	<24	24	<29	29	<23	23	9621142
F1 (C6-C10)	mg/kg	18	10	9624542							
Field Preserved Volatiles											
Benzene	mg/kg				0.014 (1)	0.012	<0.014 (1)	0.014	<0.012 (1)	0.012	9622589
Toluene	mg/kg				<0.10 (1)	0.10	<0.10 (1)	0.10	<0.080 (1)	0.080	9622589
Ethylbenzene	mg/kg				0.42 (1)	0.025	0.48 (1)	0.029	0.16 (1)	0.023	9622589
m & p-Xylene	mg/kg				0.70 (1)	0.099	0.78 (1)	0.12	0.27 (1)	0.093	9622589
o-Xylene	mg/kg				0.36 (1)	0.050	0.40 (1)	0.058	0.15 (1)	0.046	9622589
F1 (C6-C10)	mg/kg				<24 (1)	24	<29 (1)	29	<23 (1)	23	9622589
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	96		9624542							
4-Bromofluorobenzene (sur.)	%	99		9624542							
D10-o-Xylene (sur.)	%	62		9624542							
D4-1,2-Dichloroethane (sur.)	%	86		9624542							
1,4-Difluorobenzene (sur.)	%				93		94		95		9622589
4-Bromofluorobenzene (sur.)	%				103		103		104		9622589
D10-o-Xylene (sur.)	%				88		82		88		9622589
D4-1,2-Dichloroethane (sur.)	%				82		85		86		9622589

RDL = Reportable Detection Limit
(1) Detection limits raised based on sample weight used for analysis.

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Client Project #: 19-1615
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VOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ8984		WQ8985			WQ8986		
Sampling Date		2019/10/03 10:00		2019/10/03 10:05			2019/10/03 10:15		
COC Number		2 OF 4		2 OF 4			2 OF 4		
	UNITS	**SS19-16**	**RDL**	**SS19-17**	**RDL**	**QC Batch**	**SS19-18**	**RDL**	**QC Batch**
Volatiles									
Benzene	mg/kg						0.18	0.0050	9618439
Toluene	mg/kg						1.2	0.050	9618439
Ethylbenzene	mg/kg						0.25	0.010	9618439
m & p-Xylene	mg/kg						2.8	0.040	9618439
o-Xylene	mg/kg						0.66	0.020	9618439
Xylenes (Total)	mg/kg	0.48	0.097	0.93	0.11	9621142	3.5	0.045	9621142
F1 (C6-C10) - BTEX	mg/kg	<22	22	<24	24	9621142	34	10	9621142
F1 (C6-C10)	mg/kg						39	10	9618439
Field Preserved Volatiles									
Benzene	mg/kg	<0.011 (1)	0.011	<0.012 (1)	0.012	9622589			
Toluene	mg/kg	<0.080 (1)	0.080	<0.10 (1)	0.10	9622589			
Ethylbenzene	mg/kg	0.22 (1)	0.022	0.43 (1)	0.024	9622589			
m & p-Xylene	mg/kg	0.30 (1)	0.087	0.58 (1)	0.095	9622589			
o-Xylene	mg/kg	0.18 (1)	0.043	0.34 (1)	0.048	9622589			
F1 (C6-C10)	mg/kg	<22 (1)	22	<24 (1)	24	9622589			
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%						105		9618439
4-Bromofluorobenzene (sur.)	%						91		9618439
D10-o-Xylene (sur.)	%						90		9618439
D4-1,2-Dichloroethane (sur.)	%						95		9618439
1,4-Difluorobenzene (sur.)	%	94		94		9622589			
4-Bromofluorobenzene (sur.)	%	102		103		9622589			
D10-o-Xylene (sur.)	%	85		84		9622589			
D4-1,2-Dichloroethane (sur.)	%	84		83		9622589			

RDL = Reportable Detection Limit
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DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

VOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ8987		WQ8988		WQ8993			WQ8994		
Sampling Date		2019/10/03 10:25		2019/10/03 10:35		2019/10/03 10:45			2019/10/03 10:50		
COC Number		2 OF 4		2 OF 4		3 OF 4			3 OF 4		
	UNITS	**SS19-19**	**RDL**	**SS19-20**	**RDL**	**SS19-21**	**RDL**	**QC Batch**	**SS19-22**	**RDL**	**QC Batch**
Volatiles											
Xylenes (Total)	mg/kg	0.56	0.12	1.2	0.12	1.1	0.096	9621142	0.83	0.12	9621142
F1 (C6-C10) - BTEX	mg/kg	<24	24	<24	24	<22	22	9621142	<24	24	9621142
Field Preserved Volatiles											
Benzene	mg/kg	<0.014 (1)	0.014	<0.014 (1)	0.014	<0.011 (1)	0.011	9622589	<0.013 (1)	0.013	9622604
Toluene	mg/kg	<0.10 (1)	0.10	<0.10 (1)	0.10	<0.11 (1)	0.11	9622589	<0.080 (1)	0.080	9622604
Ethylbenzene	mg/kg	0.23 (1)	0.027	0.55 (1)	0.028	0.58 (1)	0.022	9622589	0.32 (1)	0.026	9622604
m & p-Xylene	mg/kg	0.36 (1)	0.11	0.74 (1)	0.11	0.69 (1)	0.086	9622589	0.53 (1)	0.11	9622604
o-Xylene	mg/kg	0.20 (1)	0.054	0.42 (1)	0.056	0.40 (1)	0.043	9622589	0.30 (1)	0.053	9622604
F1 (C6-C10)	mg/kg	<24 (1)	24	<24 (1)	24	<22 (1)	22	9622589	<24 (1)	24	9622604
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	94		94		94		9622589	101		9622604
4-Bromofluorobenzene (sur.)	%	100		101		101		9622589	99		9622604
D10-o-Xylene (sur.)	%	88		81		78		9622589	105		9622604
D4-1,2-Dichloroethane (sur.)	%	85		84		84		9622589	102		9622604

RDL = Reportable Detection Limit
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Client Project #: 19-1615
Sampler Initials: STC

VOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ8994			WQ8995		WQ8996		WQ8997		
Sampling Date		2019/10/03 10:50			2019/10/03 10:55		2019/10/03 11:00		2019/10/03 11:05		
COC Number		3 OF 4			3 OF 4		3 OF 4		3 OF 4		
	UNITS	**SS19-22 Lab-Dup**	**RDL**	**QC Batch**	**SS19-23**	**RDL**	**SS19-24**	**RDL**	**SS19-25**	**RDL**	**QC Batch**
Volatiles											
Xylenes (Total)	mg/kg				0.89	0.11	1.2	0.11	<0.13	0.13	9621142
F1 (C6-C10) - BTEX	mg/kg				<24	24	<24	24	<24	24	9621142
Field Preserved Volatiles											
Benzene	mg/kg	0.015	0.013	9622604	0.014 (1)	0.013	0.013 (1)	0.013	<0.014 (1)	0.014	9622604
Toluene	mg/kg	<0.080	0.080	9622604	<0.11 (1)	0.11	<0.080 (1)	0.080	<0.080 (1)	0.080	9622604
Ethylbenzene	mg/kg	0.29	0.026	9622604	0.41 (1)	0.025	0.50 (1)	0.026	0.054 (1)	0.028	9622604
m & p-Xylene	mg/kg	0.52	0.11	9622604	0.57 (1)	0.10	0.77 (1)	0.10	<0.11 (1)	0.11	9622604
o-Xylene	mg/kg	0.29	0.053	9622604	0.31 (1)	0.050	0.42 (1)	0.051	0.060 (1)	0.056	9622604
F1 (C6-C10)	mg/kg	<24	24	9622604	<24 (1)	24	<24 (1)	24	<24 (1)	24	9622604
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	94		9622604	93		93		92		9622604
4-Bromofluorobenzene (sur.)	%	99		9622604	101		100		101		9622604
D10-o-Xylene (sur.)	%	86		9622604	92		85		99		9622604
D4-1,2-Dichloroethane (sur.)	%	87		9622604	84		86		86		9622604

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
(1) Detection limits raised based on sample weight used for analysis.

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DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

VOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ8998		WQ8999		WQ9000			WQ9001		
Sampling Date		2019/10/03 11:10		2019/10/03 11:20		2019/10/03 11:30			2019/10/03 11:45		
COC Number		3 OF 4		3 OF 4		3 OF 4			3 OF 4		
	UNITS	**SS19-26**	**RDL**	**SS19-27**	**RDL**	**SS19-28**	**RDL**	**QC Batch**	**SS19-29**	**RDL**	**QC Batch**
Volatiles											
Xylenes (Total)	mg/kg	0.89	0.097	1.0	0.11	0.15	0.045	9621142	<0.35	0.35	9621142
F1 (C6-C10) - BTEX	mg/kg	<22	22	<24	24	<10	10	9621142	150	79	9621142
Field Preserved Volatiles											
Benzene	mg/kg	<0.011 (1)	0.011	0.021 (1)	0.012	<0.0050	0.0050	9622604	<0.040 (2)	0.040	9622604
Bromodichloromethane	mg/kg								<0.24 (2)	0.24	9622608
Toluene	mg/kg	<0.11 (1)	0.11	<0.080 (1)	0.080	<0.050	0.050	9622604	<0.12 (2)	0.12	9622604
Bromoform	mg/kg								<0.40 (2)	0.40	9622608
Ethylbenzene	mg/kg	0.40 (1)	0.022	0.45 (1)	0.024	0.065	0.010	9622604	0.096 (2)	0.079	9622604
Bromomethane	mg/kg								<0.16 (2)	0.16	9622608
Carbon tetrachloride	mg/kg								<0.0040 (2)	0.0040	9622608
m & p-Xylene	mg/kg	0.57 (1)	0.087	0.67 (1)	0.098	0.099	0.040	9622604	<0.32 (2)	0.32	9622604
Chlorobenzene	mg/kg								<0.0079 (2)	0.0079	9622608
o-Xylene	mg/kg	0.31 (1)	0.043	0.37 (1)	0.049	0.052	0.020	9622604	<0.16 (2)	0.16	9622604
Chlorodibromomethane	mg/kg								<0.16 (2)	0.16	9622608
Chloroethane	mg/kg								<0.16 (2)	0.16	9622608
Chloroform	mg/kg								<0.079 (2)	0.079	9622608
F1 (C6-C10)	mg/kg	<22 (1)	22	<24 (1)	24	<10	10	9622604	150 (2)	79	9622604
Chloromethane	mg/kg								<0.24 (2)	0.24	9622608
1,2-dibromoethane	mg/kg								<0.016 (2)	0.016	9622608
1,2-dichlorobenzene	mg/kg								<0.16 (2)	0.16	9622608
1,3-dichlorobenzene	mg/kg								<0.16 (2)	0.16	9622608
1,4-dichlorobenzene	mg/kg								<0.16 (2)	0.16	9622608
1,1-dichloroethane	mg/kg								<0.16 (2)	0.16	9622608
1,2-dichloroethane	mg/kg								<0.016 (2)	0.016	9622608
1,1-dichloroethene	mg/kg								<0.16 (2)	0.16	9622608
cis-1,2-dichloroethene	mg/kg								<0.16 (2)	0.16	9622608
trans-1,2-dichloroethene	mg/kg								<0.16 (2)	0.16	9622608
Dichloromethane	mg/kg								<0.24 (2)	0.24	9622608
1,2-dichloropropane	mg/kg								<0.16 (2)	0.16	9622608
cis-1,3-dichloropropene	mg/kg								<0.16 (2)	0.16	9622608

RDL = Reportable Detection Limit
(1) Detection limits raised based on sample weight used for analysis.
(2) Detection limits raised due to high moisture content, sample contains >= 50% moisture. Detection limits raised based on sample weight used for analysis.

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

VOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ8998		WQ8999		WQ9000			WQ9001		
Sampling Date		2019/10/03 11:10		2019/10/03 11:20		2019/10/03 11:30			2019/10/03 11:45		
COC Number		3 OF 4		3 OF 4		3 OF 4			3 OF 4		
	UNITS	**SS19-26**	**RDL**	**SS19-27**	**RDL**	**SS19-28**	**RDL**	**QC Batch**	**SS19-29**	**RDL**	**QC Batch**
trans-1,3-dichloropropene	mg/kg								<0.16 (1)	0.16	9622608
Methyl methacrylate	mg/kg								<0.32 (1)	0.32	9622608
Methyl-tert-butylether (MTBE)	mg/kg								<0.24 (1)	0.24	9622608
Styrene	mg/kg								<0.16 (1)	0.16	9622608
1,1,1,2-tetrachloroethane	mg/kg								<0.40 (1)	0.40	9622608
1,1,2,2-tetrachloroethane	mg/kg								<0.40 (1)	0.40	9622608
Tetrachloroethene	mg/kg								<0.079 (1)	0.079	9622608
1,2,3-trichlorobenzene	mg/kg								<0.32 (1)	0.32	9622608
1,2,4-trichlorobenzene	mg/kg								<0.32 (1)	0.32	9622608
1,3,5-trichlorobenzene	mg/kg								<0.32 (1)	0.32	9622608
1,1,1-trichloroethane	mg/kg								<0.16 (1)	0.16	9622608
1,1,2-trichloroethane	mg/kg								<0.16 (1)	0.16	9622608
Trichloroethene	mg/kg								<0.079 (1)	0.079	9622608
Trichlorofluoromethane	mg/kg								<0.16 (1)	0.16	9622608
1,2,4-trimethylbenzene	mg/kg								<4.0 (1)	4.0	9622608
1,3,5-trimethylbenzene	mg/kg								<4.0 (1)	4.0	9622608
Vinyl chloride	mg/kg								<0.0024 (1)	0.0024	9622608
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	96		94		93		9622604	93		9622604
4-Bromofluorobenzene (sur.)	%	99		98		100		9622604	98		9622604
D10-o-Xylene (sur.)	%	89		85		92		9622604	99		9622604
D4-1,2-Dichloroethane (sur.)	%	85		84		85		9622604	86		9622604
1,4-Difluorobenzene (sur.)	%								102		9622608
4-Bromofluorobenzene (sur.)	%								105		9622608
D10-o-Xylene (sur.)	%								96		9622608
D4-1,2-Dichloroethane (sur.)	%								114		9622608

RDL = Reportable Detection Limit

(1) Detection limits raised due to high moisture content, sample contains >= 50% moisture. Detection limits raised based on sample weight used for analysis.

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

VOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		WQ9002		WQ9004		WQ9005	WQ9006		
Sampling Date		2019/10/03 15:00		2019/10/03 15:15		2019/10/03 15:30	2019/10/03 15:40		
COC Number		3 OF 4		4 OF 4		4 OF 4	4 OF 4		
	UNITS	**SS19-30**	**RDL**	**SS19-31**	**RDL**	**SS19-32**	**SS19-33**	**RDL**	**QC Batch**
Volatiles									
Xylenes (Total)	mg/kg	<0.045	0.045	<0.092	0.092	<0.045	<0.045	0.045	9621142
F1 (C6-C10) - BTEX	mg/kg	<10	10	<21	21	<10	<10	10	9621142
Field Preserved Volatiles									
Benzene	mg/kg	<0.0050	0.0050	<0.010 (1)	0.010	<0.0050	<0.0050	0.0050	9622604
Toluene	mg/kg	<0.050	0.050	<0.080 (1)	0.080	<0.050	<0.050	0.050	9622604
Ethylbenzene	mg/kg	<0.010	0.010	<0.021 (1)	0.021	<0.010	<0.010	0.010	9622604
m & p-Xylene	mg/kg	<0.040	0.040	<0.082 (1)	0.082	<0.040	<0.040	0.040	9622604
o-Xylene	mg/kg	<0.020	0.020	<0.041 (1)	0.041	<0.020	<0.020	0.020	9622604
F1 (C6-C10)	mg/kg	<10	10	<21 (1)	21	<10	<10	10	9622604
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	94		99		101	100		9622604
4-Bromofluorobenzene (sur.)	%	99		101		100	100		9622604
D10-o-Xylene (sur.)	%	114		132		107	111		9622604
D4-1,2-Dichloroethane (sur.)	%	85		99		102	99		9622604

RDL = Reportable Detection Limit

(1) Detection limits raised due to high moisture content, sample contains >= 50% moisture. Detection limits raised due to high moisture content, sample contains >= 50% moisture.

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	15.3°C
Package 2	3.3°C
Package 3	15.7°C
Package 4	3.0°C
Package 5	0.0°C

V2: Report revised in order to conduct grain size analysis (75 um sieve) on samples SS19-30, SS-32, and SS33 as per Vanessa Krahn on 2019/10/23.

Sample WQ8980 [SS19-12] : Sample received was not in compliance with CCME sampling requirements for VOC/BTEX/F1 in soil.

Sample WQ8986 [SS19-18] : Sample received was not in compliance with CCME sampling requirements for VOC/BTEX/F1 in soil.

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL) Comments

Sample WQ8967 [SS19-01] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8968 [SS19-02] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8969 [SS19-03] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8970 [SS19-04] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8971 [SS19-05] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8972 [SS19-06] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8973 [SS19-07] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8974 [SS19-08] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8975 [SS19-09] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8976 [SS19-10] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8979 [SS19-11] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8980 [SS19-12] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8981 [SS19-13] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8982 [SS19-14] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8983 [SS19-15] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8984 [SS19-16] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8985 [SS19-17] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8987 [SS19-19] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8988 [SS19-20] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8993 [SS19-21] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8994 [SS19-22] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8995 [SS19-23] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8996 [SS19-24] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8997 [SS19-25] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8998 [SS19-26] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ8999 [SS19-27] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ9000 [SS19-28] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample WQ9001 [SS19-29] Elements by ICPMS - Soils: Detection limits raised based on sample weight used for analysis.

Results relate only to the items tested.

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9618439	DO1	Matrix Spike	1,4-Difluorobenzene (sur.)	2019/10/09		105	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/10/09		99	%	50 - 140
			D10-o-Xylene (sur.)	2019/10/09		98	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/10/09		102	%	50 - 140
			Benzene	2019/10/09		100	%	50 - 140
			Toluene	2019/10/09		92	%	50 - 140
			Ethylbenzene	2019/10/09		93	%	50 - 140
			m & p-Xylene	2019/10/09		93	%	50 - 140
			o-Xylene	2019/10/09		95	%	50 - 140
			F1 (C6-C10)	2019/10/09		91	%	60 - 140
9618439	DO1	Spiked Blank	1,4-Difluorobenzene (sur.)	2019/10/09		105	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/10/09		98	%	50 - 140
			D10-o-Xylene (sur.)	2019/10/09		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/10/09		101	%	50 - 140
			Benzene	2019/10/09		95	%	60 - 130
			Toluene	2019/10/09		91	%	60 - 130
			Ethylbenzene	2019/10/09		96	%	60 - 130
			m & p-Xylene	2019/10/09		96	%	60 - 130
			o-Xylene	2019/10/09		95	%	60 - 130
			F1 (C6-C10)	2019/10/09		102	%	60 - 140
9618439	DO1	Method Blank	1,4-Difluorobenzene (sur.)	2019/10/09		108	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/10/09		98	%	50 - 140
			D10-o-Xylene (sur.)	2019/10/09		96	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/10/09		101	%	50 - 140
			Benzene	2019/10/09	<0.0050		mg/kg	
			Toluene	2019/10/09	<0.050		mg/kg	
			Ethylbenzene	2019/10/09	<0.010		mg/kg	
			m & p-Xylene	2019/10/09	<0.040		mg/kg	
			o-Xylene	2019/10/09	<0.020		mg/kg	
			F1 (C6-C10)	2019/10/09	<10		mg/kg	
9618439	DO1	RPD	Benzene	2019/10/09	45		%	50
			Toluene	2019/10/09	40		%	50
			Ethylbenzene	2019/10/09	42		%	50
			m & p-Xylene	2019/10/09	42		%	50
			o-Xylene	2019/10/09	42		%	50
			F1 (C6-C10)	2019/10/09	31		%	40
9622589	JNG	Matrix Spike [WQ8967-02]	1,4-Difluorobenzene (sur.)	2019/10/13		94	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/10/13		101	%	50 - 140
			D10-o-Xylene (sur.)	2019/10/13		89	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/10/13		86	%	50 - 140
			Benzene	2019/10/13		83	%	50 - 140
			Toluene	2019/10/13		87	%	50 - 140
			Ethylbenzene	2019/10/13		87	%	50 - 140
			m & p-Xylene	2019/10/13		91	%	50 - 140
			o-Xylene	2019/10/13		89	%	50 - 140
			F1 (C6-C10)	2019/10/13		92	%	60 - 140
9622589	JNG	Spiked Blank	1,4-Difluorobenzene (sur.)	2019/10/13		96	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/10/13		104	%	50 - 140
			D10-o-Xylene (sur.)	2019/10/13		90	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/10/13		86	%	50 - 140
			Benzene	2019/10/13		76	%	60 - 130
			Toluene	2019/10/13		84	%	60 - 130
			Ethylbenzene	2019/10/13		85	%	60 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			m & p-Xylene	2019/10/13		89	%	60 - 130
			o-Xylene	2019/10/13		89	%	60 - 130
			F1 (C6-C10)	2019/10/13		95	%	60 - 140
9622589	JNG	Method Blank	1,4-Difluorobenzene (sur.)	2019/10/13		95	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/10/13		101	%	50 - 140
			D10-o-Xylene (sur.)	2019/10/13		85	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/10/13		85	%	50 - 140
			Benzene	2019/10/13	<0.0050		mg/kg	
			Toluene	2019/10/13	<0.050		mg/kg	
			Ethylbenzene	2019/10/13	<0.010		mg/kg	
			m & p-Xylene	2019/10/13	<0.040		mg/kg	
			o-Xylene	2019/10/13	<0.020		mg/kg	
			F1 (C6-C10)	2019/10/13	<10		mg/kg	
9622589	JNG	RPD [WQ8967-02]	Benzene	2019/10/13	NC		%	50
			Toluene	2019/10/13	NC		%	50
			Ethylbenzene	2019/10/13	2.7		%	50
			m & p-Xylene	2019/10/13	0.49		%	50
			o-Xylene	2019/10/13	4.3		%	50
			F1 (C6-C10)	2019/10/13	NC		%	30
9622604	MZ	Matrix Spike [WQ8994-02]	1,4-Difluorobenzene (sur.)	2019/10/10		97	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/10/10		101	%	50 - 140
			D10-o-Xylene (sur.)	2019/10/10		111	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/10/10		107	%	50 - 140
			Benzene	2019/10/10		98	%	50 - 140
			Toluene	2019/10/10		90	%	50 - 140
			Ethylbenzene	2019/10/10		91	%	50 - 140
			m & p-Xylene	2019/10/10		91	%	50 - 140
			o-Xylene	2019/10/10		94	%	50 - 140
			F1 (C6-C10)	2019/10/10		87	%	60 - 140
9622604	MZ	Spiked Blank	1,4-Difluorobenzene (sur.)	2019/10/11		102	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/10/11		99	%	50 - 140
			D10-o-Xylene (sur.)	2019/10/11		105	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/10/11		105	%	50 - 140
			Benzene	2019/10/11		98	%	60 - 130
			Toluene	2019/10/11		102	%	60 - 130
			Ethylbenzene	2019/10/11		96	%	60 - 130
			m & p-Xylene	2019/10/11		100	%	60 - 130
			o-Xylene	2019/10/11		100	%	60 - 130
			F1 (C6-C10)	2019/10/11		76	%	60 - 140
9622604	MZ	Method Blank	1,4-Difluorobenzene (sur.)	2019/10/10		102	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/10/10		98	%	50 - 140
			D10-o-Xylene (sur.)	2019/10/10		100	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/10/10		102	%	50 - 140
			Benzene	2019/10/10	<0.0050		mg/kg	
			Toluene	2019/10/10	<0.050		mg/kg	
			Ethylbenzene	2019/10/10	<0.010		mg/kg	
			m & p-Xylene	2019/10/10	<0.040		mg/kg	
			o-Xylene	2019/10/10	<0.020		mg/kg	
			F1 (C6-C10)	2019/10/10	<10		mg/kg	
9622604	MZ	RPD [WQ8994-02]	Benzene	2019/10/11	16		%	50
			Toluene	2019/10/11	NC		%	50
			Ethylbenzene	2019/10/11	10		%	50
			m & p-Xylene	2019/10/11	1.7		%	50

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			o-Xylene	2019/10/11	5.4		%	50
			F1 (C6-C10)	2019/10/11	NC		%	30
9622608	QW1	Matrix Spike	1,4-Difluorobenzene (sur.)	2019/10/10		101	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/10/10		102	%	50 - 140
			D10-o-Xylene (sur.)	2019/10/10		102	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/10/10		100	%	50 - 140
			Bromodichloromethane	2019/10/10		105	%	50 - 140
			Bromoform	2019/10/10		106	%	50 - 140
			Bromomethane	2019/10/10		92	%	50 - 140
			Carbon tetrachloride	2019/10/10		92	%	50 - 140
			Chlorobenzene	2019/10/10		91	%	50 - 140
			Chlorodibromomethane	2019/10/10		107	%	50 - 140
			Chloroethane	2019/10/10		110	%	50 - 140
			Chloroform	2019/10/10		95	%	50 - 140
			Chloromethane	2019/10/10		99	%	50 - 140
			1,2-dibromoethane	2019/10/10		110	%	50 - 140
			1,2-dichlorobenzene	2019/10/10		100	%	50 - 140
			1,3-dichlorobenzene	2019/10/10		94	%	50 - 140
			1,4-dichlorobenzene	2019/10/10		93	%	50 - 140
			1,1-dichloroethane	2019/10/10		98	%	50 - 140
			1,2-dichloroethane	2019/10/10		111	%	50 - 140
			1,1-dichloroethene	2019/10/10		94	%	50 - 140
			cis-1,2-dichloroethene	2019/10/10		97	%	50 - 140
			trans-1,2-dichloroethene	2019/10/10		93	%	50 - 140
			Dichloromethane	2019/10/10		97	%	50 - 140
			1,2-dichloropropane	2019/10/10		103	%	50 - 140
			cis-1,3-dichloropropene	2019/10/10		96	%	50 - 140
			trans-1,3-dichloropropene	2019/10/10		91	%	50 - 140
			Methyl methacrylate	2019/10/10		115	%	50 - 140
			Methyl-tert-butylether (MTBE)	2019/10/10		99	%	50 - 140
			Styrene	2019/10/10		98	%	50 - 140
			1,1,1,2-tetrachloroethane	2019/10/10		96	%	50 - 140
			1,1,2,2-tetrachloroethane	2019/10/10		105	%	50 - 140
			Tetrachloroethene	2019/10/10		90	%	50 - 140
			1,2,3-trichlorobenzene	2019/10/10		99	%	50 - 140
			1,2,4-trichlorobenzene	2019/10/10		95	%	50 - 140
			1,3,5-trichlorobenzene	2019/10/10		90	%	50 - 140
			1,1,1-trichloroethane	2019/10/10		95	%	50 - 140
			1,1,2-trichloroethane	2019/10/10		110	%	50 - 140
			Trichloroethene	2019/10/10		96	%	50 - 140
			Trichlorofluoromethane	2019/10/10		93	%	50 - 140
			1,2,4-trimethylbenzene	2019/10/10		92	%	50 - 140
			1,3,5-trimethylbenzene	2019/10/10		91	%	50 - 140
			Vinyl chloride	2019/10/10		96	%	50 - 140
9622608	QW1	Spiked Blank	1,4-Difluorobenzene (sur.)	2019/10/10		101	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/10/10		100	%	50 - 140
			D10-o-Xylene (sur.)	2019/10/10		101	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/10/10		99	%	50 - 140
			Bromodichloromethane	2019/10/10		104	%	60 - 130
			Bromoform	2019/10/10		107	%	60 - 130
			Bromomethane	2019/10/10		99	%	60 - 130
			Carbon tetrachloride	2019/10/10		93	%	60 - 130
			Chlorobenzene	2019/10/10		92	%	60 - 130
			Chlorodibromomethane	2019/10/10		106	%	60 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Chloroethane	2019/10/10		72	%	60 - 130
			Chloroform	2019/10/10		93	%	60 - 130
			Chloromethane	2019/10/10		94	%	60 - 130
			1,2-dibromoethane	2019/10/10		108	%	60 - 130
			1,2-dichlorobenzene	2019/10/10		99	%	60 - 130
			1,3-dichlorobenzene	2019/10/10		95	%	60 - 130
			1,4-dichlorobenzene	2019/10/10		93	%	60 - 130
			1,1-dichloroethane	2019/10/10		96	%	60 - 130
			1,2-dichloroethane	2019/10/10		107	%	60 - 130
			1,1-dichloroethene	2019/10/10		93	%	60 - 130
			cis-1,2-dichloroethene	2019/10/10		96	%	60 - 130
			trans-1,2-dichloroethene	2019/10/10		92	%	60 - 130
			Dichloromethane	2019/10/10		95	%	60 - 130
			1,2-dichloropropane	2019/10/10		100	%	60 - 130
			cis-1,3-dichloropropene	2019/10/10		114	%	60 - 130
			trans-1,3-dichloropropene	2019/10/10		119	%	60 - 130
			Methyl methacrylate	2019/10/10		112	%	60 - 130
			Methyl-tert-butylether (MTBE)	2019/10/10		96	%	60 - 130
			Styrene	2019/10/10		100	%	60 - 130
			1,1,1,2-tetrachloroethane	2019/10/10		98	%	60 - 130
			1,1,2,2-tetrachloroethane	2019/10/10		104	%	60 - 130
			Tetrachloroethene	2019/10/10		91	%	60 - 130
			1,2,3-trichlorobenzene	2019/10/10		94	%	60 - 130
			1,2,4-trichlorobenzene	2019/10/10		93	%	60 - 130
			1,3,5-trichlorobenzene	2019/10/10		92	%	60 - 130
			1,1,1-trichloroethane	2019/10/10		95	%	60 - 130
			1,1,2-trichloroethane	2019/10/10		109	%	60 - 130
			Trichloroethene	2019/10/10		97	%	60 - 130
			Trichlorofluoromethane	2019/10/10		91	%	60 - 130
			1,2,4-trimethylbenzene	2019/10/10		94	%	60 - 130
			1,3,5-trimethylbenzene	2019/10/10		92	%	60 - 130
			Vinyl chloride	2019/10/10		90	%	60 - 130
9622608	QW1	Method Blank	1,4-Difluorobenzene (sur.)	2019/10/10		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/10/10		99	%	50 - 140
			D10-o-Xylene (sur.)	2019/10/10		89	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/10/10		98	%	50 - 140
			Bromodichloromethane	2019/10/10	<0.030		mg/kg	
			Bromoform	2019/10/10	<0.050		mg/kg	
			Bromomethane	2019/10/10	<0.020		mg/kg	
			Carbon tetrachloride	2019/10/10	<0.00050		mg/kg	
			Chlorobenzene	2019/10/10	<0.0010		mg/kg	
			Chlorodibromomethane	2019/10/10	<0.020		mg/kg	
			Chloroethane	2019/10/10	<0.020		mg/kg	
			Chloroform	2019/10/10	<0.010		mg/kg	
			Chloromethane	2019/10/10	<0.030		mg/kg	
			1,2-dibromoethane	2019/10/10	<0.0020		mg/kg	
			1,2-dichlorobenzene	2019/10/10	<0.020		mg/kg	
			1,3-dichlorobenzene	2019/10/10	<0.020		mg/kg	
			1,4-dichlorobenzene	2019/10/10	<0.020		mg/kg	
			1,1-dichloroethane	2019/10/10	<0.020		mg/kg	
			1,2-dichloroethane	2019/10/10	<0.0020		mg/kg	
			1,1-dichloroethene	2019/10/10	<0.020		mg/kg	
			cis-1,2-dichloroethene	2019/10/10	<0.020		mg/kg	
			trans-1,2-dichloroethene	2019/10/10	<0.020		mg/kg	

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QUALITY ASSURANCE REPORT(CONT'D)

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			Dichloromethane	2019/10/10	<0.030		mg/kg	
			1,2-dichloropropane	2019/10/10	<0.020		mg/kg	
			cis-1,3-dichloropropene	2019/10/10	<0.020		mg/kg	
			trans-1,3-dichloropropene	2019/10/10	<0.020		mg/kg	
			Methyl methacrylate	2019/10/10	<0.040		mg/kg	
			Methyl-tert-butylether (MTBE)	2019/10/10	<0.030		mg/kg	
			Styrene	2019/10/10	<0.020		mg/kg	
			1,1,1,2-tetrachloroethane	2019/10/10	<0.050		mg/kg	
			1,1,2,2-tetrachloroethane	2019/10/10	<0.050		mg/kg	
			Tetrachloroethene	2019/10/10	<0.010		mg/kg	
			1,2,3-trichlorobenzene	2019/10/10	<0.040		mg/kg	
			1,2,4-trichlorobenzene	2019/10/10	<0.040		mg/kg	
			1,3,5-trichlorobenzene	2019/10/10	<0.040		mg/kg	
			1,1,1-trichloroethane	2019/10/10	<0.020		mg/kg	
			1,1,2-trichloroethane	2019/10/10	<0.020		mg/kg	
			Trichloroethene	2019/10/10	<0.010		mg/kg	
			Trichlorofluoromethane	2019/10/10	<0.020		mg/kg	
			1,2,4-trimethylbenzene	2019/10/10	<0.50		mg/kg	
			1,3,5-trimethylbenzene	2019/10/10	<0.50		mg/kg	
			Vinyl chloride	2019/10/10	<0.00030		mg/kg	
9622608	QW1	RPD	Bromodichloromethane	2019/10/10	NC		%	50
			Bromoform	2019/10/10	NC		%	50
			Bromomethane	2019/10/10	NC		%	50
			Carbon tetrachloride	2019/10/10	NC		%	50
			Chlorobenzene	2019/10/10	NC		%	50
			Chlorodibromomethane	2019/10/10	NC		%	50
			Chloroethane	2019/10/10	NC		%	50
			Chloroform	2019/10/10	NC		%	50
			Chloromethane	2019/10/10	NC		%	50
			1,2-dibromoethane	2019/10/10	NC		%	50
			1,2-dichlorobenzene	2019/10/10	NC		%	50
			1,3-dichlorobenzene	2019/10/10	NC		%	50
			1,4-dichlorobenzene	2019/10/10	NC		%	50
			1,1-dichloroethane	2019/10/10	NC		%	50
			1,2-dichloroethane	2019/10/10	NC		%	50
			1,1-dichloroethene	2019/10/10	NC		%	50
			cis-1,2-dichloroethene	2019/10/10	NC		%	50
			trans-1,2-dichloroethene	2019/10/10	NC		%	50
			Dichloromethane	2019/10/10	NC		%	50
			1,2-dichloropropane	2019/10/10	NC		%	50
			cis-1,3-dichloropropene	2019/10/10	NC		%	50
			trans-1,3-dichloropropene	2019/10/10	NC		%	50
			Methyl methacrylate	2019/10/10	NC		%	50
			Methyl-tert-butylether (MTBE)	2019/10/10	NC		%	50
			Styrene	2019/10/10	NC		%	50
			1,1,1,2-tetrachloroethane	2019/10/10	NC		%	50
			1,1,2,2-tetrachloroethane	2019/10/10	NC		%	50
			Tetrachloroethene	2019/10/10	NC		%	50
			1,2,3-trichlorobenzene	2019/10/10	NC		%	50
			1,2,4-trichlorobenzene	2019/10/10	NC		%	50
			1,3,5-trichlorobenzene	2019/10/10	NC		%	50
			1,1,1-trichloroethane	2019/10/10	NC		%	50
			1,1,2-trichloroethane	2019/10/10	NC		%	50
			Trichloroethene	2019/10/10	NC		%	50

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Trichlorofluoromethane	2019/10/10	NC		%	50
			1,2,4-trimethylbenzene	2019/10/10	NC		%	50
			1,3,5-trimethylbenzene	2019/10/10	NC		%	50
			Vinyl chloride	2019/10/10	NC		%	50
9622653	VP4	Matrix Spike [WQ8988-01]	O-TERPHENYL (sur.)	2019/10/10		80	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2019/10/10		77	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2019/10/10		85	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2019/10/10		87	%	60 - 140
9622653	VP4	Spiked Blank	O-TERPHENYL (sur.)	2019/10/10		100	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2019/10/10		97	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2019/10/10		103	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2019/10/10		97	%	60 - 140
9622653	VP4	Method Blank	O-TERPHENYL (sur.)	2019/10/10		104	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2019/10/10	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2019/10/10	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2019/10/10	<50		mg/kg	
9622653	VP4	RPD [WQ8988-01]	F2 (C10-C16 Hydrocarbons)	2019/10/10	26		%	40
			F3 (C16-C34 Hydrocarbons)	2019/10/10	12		%	40
			F4 (C34-C50 Hydrocarbons)	2019/10/10	10		%	40
9622657	NK3	Matrix Spike [WQ8988-01]	D10-ANTHRACENE (sur.)	2019/10/10		72	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2019/10/10		73	%	50 - 130
			D8-NAPHTHALENE (sur.)	2019/10/10		74	%	50 - 130
			TERPHENYL-D14 (sur.)	2019/10/10		73	%	50 - 130
			Acenaphthene	2019/10/10		72	%	50 - 130
			Acenaphthylene	2019/10/10		71	%	50 - 130
			Acridine	2019/10/10		5.4 (1)	%	50 - 130
			Anthracene	2019/10/10		67	%	50 - 130
			Benzo(a)anthracene	2019/10/10		63	%	50 - 130
			Benzo(b&j)fluoranthene	2019/10/10		43 (1)	%	50 - 130
			Benzo(k)fluoranthene	2019/10/10		47 (1)	%	50 - 130
			Benzo(g,h,i)perylene	2019/10/10		30 (1)	%	50 - 130
			Benzo(c)phenanthrene	2019/10/10		72	%	50 - 130
			Benzo(a)pyrene	2019/10/10		42 (1)	%	50 - 130
			Benzo(e)pyrene	2019/10/10		40 (1)	%	50 - 130
			Chrysene	2019/10/10		47 (1)	%	50 - 130
			Dibenz(a,h)anthracene	2019/10/10		49 (1)	%	50 - 130
			Fluoranthene	2019/10/10		55	%	50 - 130
			Fluorene	2019/10/10		78	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2019/10/10		37 (1)	%	50 - 130
			2-Methylnaphthalene	2019/10/10		79	%	50 - 130
			Naphthalene	2019/10/10		71	%	50 - 130
			Phenanthrene	2019/10/10		63	%	50 - 130
			Perylene	2019/10/10		35 (1)	%	50 - 130
			Pyrene	2019/10/10		52	%	50 - 130
			Quinoline	2019/10/10		97	%	50 - 130
9622657	NK3	Spiked Blank	D10-ANTHRACENE (sur.)	2019/10/10		94	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2019/10/10		94	%	50 - 130
			D8-NAPHTHALENE (sur.)	2019/10/10		91	%	50 - 130
			TERPHENYL-D14 (sur.)	2019/10/10		89	%	50 - 130
			Acenaphthene	2019/10/10		92	%	50 - 130
			Acenaphthylene	2019/10/10		93	%	50 - 130
			Acridine	2019/10/10		74	%	50 - 130

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Anthracene	2019/10/10		92	%	50 - 130
			Benzo(a)anthracene	2019/10/10		107	%	50 - 130
			Benzo(b&j)fluoranthene	2019/10/10		92	%	50 - 130
			Benzo(k)fluoranthene	2019/10/10		94	%	50 - 130
			Benzo(g,h,i)perylene	2019/10/10		92	%	50 - 130
			Benzo(c)phenanthrene	2019/10/10		104	%	50 - 130
			Benzo(a)pyrene	2019/10/10		98	%	50 - 130
			Benzo(e)pyrene	2019/10/10		93	%	50 - 130
			Chrysene	2019/10/10		97	%	50 - 130
			Dibenz(a,h)anthracene	2019/10/10		99	%	50 - 130
			Fluoranthene	2019/10/10		104	%	50 - 130
			Fluorene	2019/10/10		95	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2019/10/10		93	%	50 - 130
			2-Methylnaphthalene	2019/10/10		89	%	50 - 130
			Naphthalene	2019/10/10		85	%	50 - 130
			Phenanthrene	2019/10/10		92	%	50 - 130
			Perylene	2019/10/10		88	%	50 - 130
			Pyrene	2019/10/10		103	%	50 - 130
			Quinoline	2019/10/10		114	%	50 - 130
9622657	NK3	Method Blank	D10-ANTHRACENE (sur.)	2019/10/10		96	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2019/10/10		92	%	50 - 130
			D8-NAPHTHALENE (sur.)	2019/10/10		85	%	50 - 130
			TERPHENYL-D14 (sur.)	2019/10/10		89	%	50 - 130
			Acenaphthene	2019/10/10	<0.0050		mg/kg	
			Acenaphthylene	2019/10/10	<0.0050		mg/kg	
			Acridine	2019/10/10	<0.010		mg/kg	
			Anthracene	2019/10/10	<0.0040		mg/kg	
			Benzo(a)anthracene	2019/10/10	<0.0050		mg/kg	
			Benzo(b&j)fluoranthene	2019/10/10	<0.0050		mg/kg	
			Benzo(k)fluoranthene	2019/10/10	<0.0050		mg/kg	
			Benzo(g,h,i)perylene	2019/10/10	<0.0050		mg/kg	
			Benzo(c)phenanthrene	2019/10/10	<0.0050		mg/kg	
			Benzo(a)pyrene	2019/10/10	<0.0050		mg/kg	
			Benzo(e)pyrene	2019/10/10	<0.0050		mg/kg	
			Chrysene	2019/10/10	<0.0050		mg/kg	
			Dibenz(a,h)anthracene	2019/10/10	<0.0050		mg/kg	
			Fluoranthene	2019/10/10	<0.0050		mg/kg	
			Fluorene	2019/10/10	<0.0050		mg/kg	
			Indeno(1,2,3-cd)pyrene	2019/10/10	<0.0050		mg/kg	
			2-Methylnaphthalene	2019/10/10	<0.0050		mg/kg	
			Naphthalene	2019/10/10	<0.0050		mg/kg	
			Phenanthrene	2019/10/10	<0.0050		mg/kg	
			Perylene	2019/10/10	<0.0050		mg/kg	
			Pyrene	2019/10/10	<0.0050		mg/kg	
			Quinoline	2019/10/10	<0.010		mg/kg	
9622657	NK3	RPD [WQ8988-01]	Acenaphthene	2019/10/11	NC		%	50
			Acenaphthylene	2019/10/11	8.1		%	50
			Acridine	2019/10/11	NC		%	50
			Anthracene	2019/10/11	9.1		%	50
			Benzo(a)anthracene	2019/10/11	35		%	50
			Benzo(b&j)fluoranthene	2019/10/11	2.8		%	50
			Benzo(k)fluoranthene	2019/10/11	22		%	50
			Benzo(g,h,i)perylene	2019/10/11	11		%	50
			Benzo(c)phenanthrene	2019/10/11	NC		%	50

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			Benzo(a)pyrene	2019/10/11	28		%	50
			Benzo(e)pyrene	2019/10/11	9.7		%	50
			Chrysene	2019/10/11	40		%	50
			Dibenz(a,h)anthracene	2019/10/11	NC		%	50
			Fluoranthene	2019/10/11	45		%	50
			Fluorene	2019/10/11	22		%	50
			Indeno(1,2,3-cd)pyrene	2019/10/11	13		%	50
			2-Methylnaphthalene	2019/10/11	12		%	50
			Naphthalene	2019/10/11	8.6		%	50
			Phenanthrene	2019/10/11	29		%	50
			Perylene	2019/10/11	NC		%	50
			Pyrene	2019/10/11	39		%	50
			Quinoline	2019/10/11	NC		%	50
9622663	VP4	Matrix Spike [WQ9006-01]	O-TERPHENYL (sur.)	2019/10/10		90	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2019/10/10		87	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2019/10/10		91	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2019/10/10		90	%	60 - 140
9622663	VP4	Spiked Blank	O-TERPHENYL (sur.)	2019/10/10		92	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2019/10/10		93	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2019/10/10		97	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2019/10/10		94	%	60 - 140
9622663	VP4	Method Blank	O-TERPHENYL (sur.)	2019/10/10		102	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2019/10/10	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2019/10/10	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2019/10/10	<50		mg/kg	
9622663	VP4	RPD [WQ9006-01]	F2 (C10-C16 Hydrocarbons)	2019/10/10	NC		%	40
			F3 (C16-C34 Hydrocarbons)	2019/10/10	NC		%	40
			F4 (C34-C50 Hydrocarbons)	2019/10/10	NC		%	40
9622668	NK3	Matrix Spike [WQ9006-01]	D10-ANTHRACENE (sur.)	2019/10/10		81	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2019/10/10		81	%	50 - 130
			D8-NAPHTHALENE (sur.)	2019/10/10		78	%	50 - 130
			TERPHENYL-D14 (sur.)	2019/10/10		71	%	50 - 130
			Acenaphthene	2019/10/10		82	%	50 - 130
			Acenaphthylene	2019/10/10		80	%	50 - 130
			Acridine	2019/10/10		67	%	50 - 130
			Anthracene	2019/10/10		80	%	50 - 130
			Benzo(a)anthracene	2019/10/10		87	%	50 - 130
			Benzo(b&j)fluoranthene	2019/10/10		77	%	50 - 130
			Benzo(k)fluoranthene	2019/10/10		78	%	50 - 130
			Benzo(g,h,i)perylene	2019/10/10		82	%	50 - 130
			Benzo(c)phenanthrene	2019/10/10		87	%	50 - 130
			Benzo(a)pyrene	2019/10/10		84	%	50 - 130
			Benzo(e)pyrene	2019/10/10		83	%	50 - 130
			Chrysene	2019/10/10		84	%	50 - 130
			Dibenz(a,h)anthracene	2019/10/10		83	%	50 - 130
			Fluoranthene	2019/10/10		77	%	50 - 130
			Fluorene	2019/10/10		82	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2019/10/10		84	%	50 - 130
			2-Methylnaphthalene	2019/10/10		75	%	50 - 130
			Naphthalene	2019/10/10		74	%	50 - 130
			Phenanthrene	2019/10/10		79	%	50 - 130
			Perylene	2019/10/10		76	%	50 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Pyrene	2019/10/10		79	%	50 - 130
			Quinoline	2019/10/10		104	%	50 - 130
9622668	NK3	Spiked Blank	D10-ANTHRACENE (sur.)	2019/10/10		87	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2019/10/10		87	%	50 - 130
			D8-NAPHTHALENE (sur.)	2019/10/10		86	%	50 - 130
			TERPHENYL-D14 (sur.)	2019/10/10		78	%	50 - 130
			Acenaphthene	2019/10/10		88	%	50 - 130
			Acenaphthylene	2019/10/10		86	%	50 - 130
			Acridine	2019/10/10		68	%	50 - 130
			Anthracene	2019/10/10		86	%	50 - 130
			Benzo(a)anthracene	2019/10/10		92	%	50 - 130
			Benzo(b&j)fluoranthene	2019/10/10		86	%	50 - 130
			Benzo(k)fluoranthene	2019/10/10		74	%	50 - 130
			Benzo(g,h,i)perylene	2019/10/10		88	%	50 - 130
			Benzo(c)phenanthrene	2019/10/10		94	%	50 - 130
			Benzo(a)pyrene	2019/10/10		91	%	50 - 130
			Benzo(e)pyrene	2019/10/10		89	%	50 - 130
			Chrysene	2019/10/10		93	%	50 - 130
			Dibenz(a,h)anthracene	2019/10/10		86	%	50 - 130
			Fluoranthene	2019/10/10		83	%	50 - 130
			Fluorene	2019/10/10		88	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2019/10/10		89	%	50 - 130
			2-Methylnaphthalene	2019/10/10		82	%	50 - 130
			Naphthalene	2019/10/10		80	%	50 - 130
			Phenanthrene	2019/10/10		86	%	50 - 130
			Perylene	2019/10/10		84	%	50 - 130
			Pyrene	2019/10/10		85	%	50 - 130
			Quinoline	2019/10/10		106	%	50 - 130
9622668	NK3	Method Blank	D10-ANTHRACENE (sur.)	2019/10/10		89	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2019/10/10		87	%	50 - 130
			D8-NAPHTHALENE (sur.)	2019/10/10		82	%	50 - 130
			TERPHENYL-D14 (sur.)	2019/10/10		78	%	50 - 130
			Acenaphthene	2019/10/10	<0.0050		mg/kg	
			Acenaphthylene	2019/10/10	<0.0050		mg/kg	
			Acridine	2019/10/10	<0.010		mg/kg	
			Anthracene	2019/10/10	<0.0040		mg/kg	
			Benzo(a)anthracene	2019/10/10	<0.0050		mg/kg	
			Benzo(b&j)fluoranthene	2019/10/10	<0.0050		mg/kg	
			Benzo(k)fluoranthene	2019/10/10	<0.0050		mg/kg	
			Benzo(g,h,i)perylene	2019/10/10	<0.0050		mg/kg	
			Benzo(c)phenanthrene	2019/10/10	<0.0050		mg/kg	
			Benzo(a)pyrene	2019/10/10	<0.0050		mg/kg	
			Benzo(e)pyrene	2019/10/10	<0.0050		mg/kg	
			Chrysene	2019/10/10	<0.0050		mg/kg	
			Dibenz(a,h)anthracene	2019/10/10	<0.0050		mg/kg	
			Fluoranthene	2019/10/10	<0.0050		mg/kg	
			Fluorene	2019/10/10	<0.0050		mg/kg	
			Indeno(1,2,3-cd)pyrene	2019/10/10	<0.0050		mg/kg	
			2-Methylnaphthalene	2019/10/10	<0.0050		mg/kg	
			Naphthalene	2019/10/10	<0.0050		mg/kg	
			Phenanthrene	2019/10/10	<0.0050		mg/kg	
			Perylene	2019/10/10	<0.0050		mg/kg	
			Pyrene	2019/10/10	<0.0050		mg/kg	
			Quinoline	2019/10/10	<0.010		mg/kg	

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9622668	NK3	RPD [WQ9006-01]	Acenaphthene	2019/10/10	NC		%	50
			Acenaphthylene	2019/10/10	NC		%	50
			Acridine	2019/10/10	NC		%	50
			Anthracene	2019/10/10	NC		%	50
			Benzo(a)anthracene	2019/10/10	NC		%	50
			Benzo(b&j)fluoranthene	2019/10/10	NC		%	50
			Benzo(k)fluoranthene	2019/10/10	NC		%	50
			Benzo(g,h,i)perylene	2019/10/10	NC		%	50
			Benzo(c)phenanthrene	2019/10/10	NC		%	50
			Benzo(a)pyrene	2019/10/10	NC		%	50
			Benzo(e)pyrene	2019/10/10	NC		%	50
			Chrysene	2019/10/10	NC		%	50
			Dibenz(a,h)anthracene	2019/10/10	NC		%	50
			Fluoranthene	2019/10/10	NC		%	50
			Fluorene	2019/10/10	NC		%	50
			Indeno(1,2,3-cd)pyrene	2019/10/10	NC		%	50
			2-Methylnaphthalene	2019/10/10	NC		%	50
			Naphthalene	2019/10/10	NC		%	50
			Phenanthrene	2019/10/10	NC		%	50
			Perylene	2019/10/10	NC		%	50
			Pyrene	2019/10/10	NC		%	50
			Quinoline	2019/10/10	NC		%	50
9622866	SAY	Method Blank	Moisture	2019/10/11	<0.30		%	
9622866	SAY	RPD	Moisture	2019/10/11	8.2		%	20
9623376	SAY	Method Blank	Moisture	2019/10/11	<0.30		%	
9623376	SAY	RPD [WQ8988-01]	Moisture	2019/10/11	0.89		%	20
9624542	JNG	Matrix Spike	1,4-Difluorobenzene (sur.)	2019/10/13		96	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/10/13		99	%	50 - 140
			D10-o-Xylene (sur.)	2019/10/13		87	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/10/13		85	%	50 - 140
			Benzene	2019/10/13		88	%	50 - 140
			Toluene	2019/10/13		92	%	50 - 140
			Ethylbenzene	2019/10/13		94	%	50 - 140
			m & p-Xylene	2019/10/13		97	%	50 - 140
			o-Xylene	2019/10/13		95	%	50 - 140
			F1 (C6-C10)	2019/10/13		92	%	60 - 140
9624542	JNG	Spiked Blank	1,4-Difluorobenzene (sur.)	2019/10/13		101	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/10/13		107	%	50 - 140
			D10-o-Xylene (sur.)	2019/10/13		89	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/10/13		87	%	50 - 140
			Benzene	2019/10/13		78	%	60 - 130
			Toluene	2019/10/13		88	%	60 - 130
			Ethylbenzene	2019/10/13		87	%	60 - 130
			m & p-Xylene	2019/10/13		92	%	60 - 130
			o-Xylene	2019/10/13		92	%	60 - 130
			F1 (C6-C10)	2019/10/13		88	%	60 - 140
9624542	JNG	Method Blank	1,4-Difluorobenzene (sur.)	2019/10/13		96	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/10/13		100	%	50 - 140
			D10-o-Xylene (sur.)	2019/10/13		86	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/10/13		85	%	50 - 140
			Benzene	2019/10/13	<0.0050		mg/kg	
			Toluene	2019/10/13	<0.050		mg/kg	
			Ethylbenzene	2019/10/13	<0.010		mg/kg	
			m & p-Xylene	2019/10/13	<0.040		mg/kg	

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Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			o-Xylene	2019/10/13	<0.020		mg/kg	
			F1 (C6-C10)	2019/10/13	<10		mg/kg	
9624542	JNG	RPD	Benzene	2019/10/13	NC		%	50
			Toluene	2019/10/13	NC		%	50
			Ethylbenzene	2019/10/13	NC		%	50
			m & p-Xylene	2019/10/13	NC		%	50
			o-Xylene	2019/10/13	NC		%	50
			F1 (C6-C10)	2019/10/13	NC		%	40
9624564	ANE	Matrix Spike [WQ9006-03]	Total Aluminum (Al)	2019/10/15		NC	%	75 - 125
			Total Antimony (Sb)	2019/10/15		97	%	75 - 125
			Total Arsenic (As)	2019/10/15		102	%	75 - 125
			Total Barium (Ba)	2019/10/15		105	%	75 - 125
			Total Beryllium (Be)	2019/10/15		101	%	75 - 125
			Total Boron (B)	2019/10/15		103	%	75 - 125
			Total Cadmium (Cd)	2019/10/15		105	%	75 - 125
			Total Chromium (Cr)	2019/10/15		105	%	75 - 125
			Total Cobalt (Co)	2019/10/15		99	%	75 - 125
			Total Copper (Cu)	2019/10/15		96	%	75 - 125
			Total Iron (Fe)	2019/10/15		NC	%	75 - 125
			Total Lead (Pb)	2019/10/15		92	%	75 - 125
			Total Magnesium (Mg)	2019/10/15		NC	%	75 - 125
			Total Manganese (Mn)	2019/10/15		NC	%	75 - 125
			Total Mercury (Hg)	2019/10/15		81	%	75 - 125
			Total Molybdenum (Mo)	2019/10/15		109	%	75 - 125
			Total Nickel (Ni)	2019/10/15		99	%	75 - 125
			Total Selenium (Se)	2019/10/15		109	%	75 - 125
			Total Silver (Ag)	2019/10/15		101	%	75 - 125
			Total Thallium (Tl)	2019/10/15		103	%	75 - 125
			Total Tin (Sn)	2019/10/15		106	%	75 - 125
			Total Uranium (U)	2019/10/15		98	%	75 - 125
			Total Vanadium (V)	2019/10/15		111	%	75 - 125
			Total Zinc (Zn)	2019/10/15		96	%	75 - 125
9624564	ANE	QC Standard	Total Aluminum (Al)	2019/10/15		104	%	74 - 126
			Total Antimony (Sb)	2019/10/15		129	%	15 - 182
			Total Arsenic (As)	2019/10/15		121	%	53 - 147
			Total Barium (Ba)	2019/10/15		106	%	80 - 119
			Total Boron (B)	2019/10/15		115	%	70 - 130
			Total Cadmium (Cd)	2019/10/15		105	%	72 - 128
			Total Chromium (Cr)	2019/10/15		114	%	59 - 141
			Total Cobalt (Co)	2019/10/15		106	%	58 - 142
			Total Copper (Cu)	2019/10/15		108	%	83 - 117
			Total Iron (Fe)	2019/10/15		111	%	78 - 122
			Total Lead (Pb)	2019/10/15		113	%	79 - 121
			Total Magnesium (Mg)	2019/10/15		102	%	74 - 126
			Total Manganese (Mn)	2019/10/15		115	%	76 - 124
			Total Molybdenum (Mo)	2019/10/15		112	%	67 - 133
			Total Nickel (Ni)	2019/10/15		114	%	79 - 121
			Total Silver (Ag)	2019/10/15		97	%	47 - 153
			Total Tin (Sn)	2019/10/15		108	%	67 - 133
			Total Uranium (U)	2019/10/15		101	%	77 - 123
			Total Vanadium (V)	2019/10/15		118	%	79 - 121
			Total Zinc (Zn)	2019/10/15		108	%	79 - 121
9624564	ANE	Spiked Blank	Total Aluminum (Al)	2019/10/15		101	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Antimony (Sb)	2019/10/15		98	%	80 - 120
			Total Arsenic (As)	2019/10/15		99	%	80 - 120
			Total Barium (Ba)	2019/10/15		99	%	80 - 120
			Total Beryllium (Be)	2019/10/15		97	%	80 - 120
			Total Boron (B)	2019/10/15		95	%	80 - 120
			Total Cadmium (Cd)	2019/10/15		103	%	80 - 120
			Total Chromium (Cr)	2019/10/15		101	%	80 - 120
			Total Cobalt (Co)	2019/10/15		99	%	80 - 120
			Total Copper (Cu)	2019/10/15		100	%	80 - 120
			Total Iron (Fe)	2019/10/15		116	%	80 - 120
			Total Lead (Pb)	2019/10/15		98	%	80 - 120
			Total Magnesium (Mg)	2019/10/15		103	%	80 - 120
			Total Manganese (Mn)	2019/10/15		99	%	80 - 120
			Total Mercury (Hg)	2019/10/15		81	%	80 - 120
			Total Molybdenum (Mo)	2019/10/15		102	%	80 - 120
			Total Nickel (Ni)	2019/10/15		100	%	80 - 120
			Total Selenium (Se)	2019/10/15		112	%	80 - 120
			Total Silver (Ag)	2019/10/15		101	%	80 - 120
			Total Thallium (Tl)	2019/10/15		105	%	80 - 120
			Total Tin (Sn)	2019/10/15		100	%	80 - 120
			Total Uranium (U)	2019/10/15		99	%	80 - 120
			Total Vanadium (V)	2019/10/15		103	%	80 - 120
			Total Zinc (Zn)	2019/10/15		99	%	80 - 120
9624564	ANE	Method Blank	Total Aluminum (Al)	2019/10/15	<100		mg/kg	
			Total Antimony (Sb)	2019/10/15	<0.50		mg/kg	
			Total Arsenic (As)	2019/10/15	<1.0		mg/kg	
			Total Barium (Ba)	2019/10/15	<1.0		mg/kg	
			Total Beryllium (Be)	2019/10/15	<0.40		mg/kg	
			Total Boron (B)	2019/10/15	<0.80		mg/kg	
			Total Cadmium (Cd)	2019/10/15	<0.050		mg/kg	
			Total Chromium (Cr)	2019/10/15	<1.0		mg/kg	
			Total Cobalt (Co)	2019/10/15	<0.50		mg/kg	
			Total Copper (Cu)	2019/10/15	<1.0		mg/kg	
			Total Iron (Fe)	2019/10/15	<100		mg/kg	
			Total Lead (Pb)	2019/10/15	<0.50		mg/kg	
			Total Magnesium (Mg)	2019/10/15	<50		mg/kg	
			Total Manganese (Mn)	2019/10/15	<1.0		mg/kg	
			Total Mercury (Hg)	2019/10/15	<0.050		mg/kg	
			Total Molybdenum (Mo)	2019/10/15	<0.40		mg/kg	
			Total Nickel (Ni)	2019/10/15	<1.0		mg/kg	
			Total Selenium (Se)	2019/10/15	<0.50		mg/kg	
			Total Silver (Ag)	2019/10/15	<0.20		mg/kg	
			Total Thallium (Tl)	2019/10/15	<0.10		mg/kg	
			Total Tin (Sn)	2019/10/15	<1.0		mg/kg	
			Total Uranium (U)	2019/10/15	<0.20		mg/kg	
			Total Vanadium (V)	2019/10/15	<1.0		mg/kg	
			Total Zinc (Zn)	2019/10/15	<10		mg/kg	
9624564	ANE	RPD [WQ9006-03]	Total Aluminum (Al)	2019/10/15	4.6		%	35
			Total Antimony (Sb)	2019/10/15	NC		%	30
			Total Arsenic (As)	2019/10/15	9.9		%	30
			Total Barium (Ba)	2019/10/15	4.9		%	35
			Total Beryllium (Be)	2019/10/15	NC		%	30
			Total Boron (B)	2019/10/15	3.4		%	30
			Total Cadmium (Cd)	2019/10/15	NC		%	30

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Chromium (Cr)	2019/10/15	6.5		%	30
			Total Cobalt (Co)	2019/10/15	3.7		%	30
			Total Copper (Cu)	2019/10/15	2.3		%	30
			Total Iron (Fe)	2019/10/15	1.3		%	30
			Total Lead (Pb)	2019/10/15	15		%	35
			Total Magnesium (Mg)	2019/10/15	0.096		%	30
			Total Manganese (Mn)	2019/10/15	3.9		%	30
			Total Mercury (Hg)	2019/10/15	NC		%	35
			Total Molybdenum (Mo)	2019/10/15	1.9		%	35
			Total Nickel (Ni)	2019/10/15	3.6		%	30
			Total Selenium (Se)	2019/10/15	NC		%	30
			Total Silver (Ag)	2019/10/15	NC		%	35
			Total Thallium (Tl)	2019/10/15	1.1		%	30
			Total Tin (Sn)	2019/10/15	NC		%	35
			Total Uranium (U)	2019/10/15	26		%	30
			Total Vanadium (V)	2019/10/15	4.4		%	30
			Total Zinc (Zn)	2019/10/15	6.2		%	30
9624891	ANE	Matrix Spike	Total Aluminum (Al)	2019/10/15		NC	%	75 - 125
			Total Antimony (Sb)	2019/10/15		95	%	75 - 125
			Total Arsenic (As)	2019/10/15		95	%	75 - 125
			Total Barium (Ba)	2019/10/15		106	%	75 - 125
			Total Beryllium (Be)	2019/10/15		100	%	75 - 125
			Total Boron (B)	2019/10/15		103	%	75 - 125
			Total Cadmium (Cd)	2019/10/15		100	%	75 - 125
			Total Chromium (Cr)	2019/10/15		102	%	75 - 125
			Total Cobalt (Co)	2019/10/15		95	%	75 - 125
			Total Copper (Cu)	2019/10/15		93	%	75 - 125
			Total Iron (Fe)	2019/10/15		NC	%	75 - 125
			Total Lead (Pb)	2019/10/15		92	%	75 - 125
			Total Magnesium (Mg)	2019/10/15		NC	%	75 - 125
			Total Manganese (Mn)	2019/10/15		NC	%	75 - 125
			Total Mercury (Hg)	2019/10/15		80	%	75 - 125
			Total Molybdenum (Mo)	2019/10/15		103	%	75 - 125
			Total Nickel (Ni)	2019/10/15		94	%	75 - 125
			Total Selenium (Se)	2019/10/15		106	%	75 - 125
			Total Silver (Ag)	2019/10/15		98	%	75 - 125
			Total Thallium (Tl)	2019/10/15		100	%	75 - 125
			Total Tin (Sn)	2019/10/15		101	%	75 - 125
			Total Uranium (U)	2019/10/15		97	%	75 - 125
			Total Vanadium (V)	2019/10/15		104	%	75 - 125
			Total Zinc (Zn)	2019/10/15		93	%	75 - 125
9624891	ANE	QC Standard	Total Aluminum (Al)	2019/10/15		96	%	74 - 126
			Total Antimony (Sb)	2019/10/15		115	%	15 - 182
			Total Arsenic (As)	2019/10/15		112	%	53 - 147
			Total Barium (Ba)	2019/10/15		105	%	80 - 119
			Total Boron (B)	2019/10/15		96	%	70 - 130
			Total Cadmium (Cd)	2019/10/15		103	%	72 - 128
			Total Chromium (Cr)	2019/10/15		103	%	59 - 141
			Total Cobalt (Co)	2019/10/15		99	%	58 - 142
			Total Copper (Cu)	2019/10/15		107	%	83 - 117
			Total Iron (Fe)	2019/10/15		106	%	78 - 122
			Total Lead (Pb)	2019/10/15		113	%	79 - 121
			Total Magnesium (Mg)	2019/10/15		97	%	74 - 126
			Total Manganese (Mn)	2019/10/15		106	%	76 - 124

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Molybdenum (Mo)	2019/10/15		111	%	67 - 133
			Total Nickel (Ni)	2019/10/15		107	%	79 - 121
			Total Silver (Ag)	2019/10/15		108	%	47 - 153
			Total Tin (Sn)	2019/10/15		106	%	67 - 133
			Total Uranium (U)	2019/10/15		94	%	77 - 123
			Total Vanadium (V)	2019/10/15		108	%	79 - 121
			Total Zinc (Zn)	2019/10/15		105	%	79 - 121
9624891	ANE	Spiked Blank	Total Aluminum (Al)	2019/10/15		100	%	80 - 120
			Total Antimony (Sb)	2019/10/15		101	%	80 - 120
			Total Arsenic (As)	2019/10/15		101	%	80 - 120
			Total Barium (Ba)	2019/10/15		101	%	80 - 120
			Total Beryllium (Be)	2019/10/15		98	%	80 - 120
			Total Boron (B)	2019/10/15		96	%	80 - 120
			Total Cadmium (Cd)	2019/10/15		102	%	80 - 120
			Total Chromium (Cr)	2019/10/15		103	%	80 - 120
			Total Cobalt (Co)	2019/10/15		102	%	80 - 120
			Total Copper (Cu)	2019/10/15		102	%	80 - 120
			Total Iron (Fe)	2019/10/15		120	%	80 - 120
			Total Lead (Pb)	2019/10/15		98	%	80 - 120
			Total Magnesium (Mg)	2019/10/15		102	%	80 - 120
			Total Manganese (Mn)	2019/10/15		101	%	80 - 120
			Total Mercury (Hg)	2019/10/15		82	%	80 - 120
			Total Molybdenum (Mo)	2019/10/15		102	%	80 - 120
			Total Nickel (Ni)	2019/10/15		101	%	80 - 120
			Total Selenium (Se)	2019/10/15		112	%	80 - 120
			Total Silver (Ag)	2019/10/15		100	%	80 - 120
			Total Thallium (Tl)	2019/10/15		104	%	80 - 120
			Total Tin (Sn)	2019/10/15		100	%	80 - 120
			Total Uranium (U)	2019/10/15		102	%	80 - 120
			Total Vanadium (V)	2019/10/15		105	%	80 - 120
			Total Zinc (Zn)	2019/10/15		100	%	80 - 120
9624891	ANE	Method Blank	Total Aluminum (Al)	2019/10/15	<100		mg/kg	
			Total Antimony (Sb)	2019/10/15	<0.50		mg/kg	
			Total Arsenic (As)	2019/10/15	<1.0		mg/kg	
			Total Barium (Ba)	2019/10/15	<1.0		mg/kg	
			Total Beryllium (Be)	2019/10/15	<0.40		mg/kg	
			Total Boron (B)	2019/10/15	<0.80		mg/kg	
			Total Cadmium (Cd)	2019/10/15	<0.050		mg/kg	
			Total Chromium (Cr)	2019/10/15	<1.0		mg/kg	
			Total Cobalt (Co)	2019/10/15	<0.50		mg/kg	
			Total Copper (Cu)	2019/10/15	<1.0		mg/kg	
			Total Iron (Fe)	2019/10/15	<100		mg/kg	
			Total Lead (Pb)	2019/10/15	<0.50		mg/kg	
			Total Magnesium (Mg)	2019/10/15	<50		mg/kg	
			Total Manganese (Mn)	2019/10/15	<1.0		mg/kg	
			Total Mercury (Hg)	2019/10/15	<0.050		mg/kg	
			Total Molybdenum (Mo)	2019/10/15	<0.40		mg/kg	
			Total Nickel (Ni)	2019/10/15	<1.0		mg/kg	
			Total Selenium (Se)	2019/10/15	<0.50		mg/kg	
			Total Silver (Ag)	2019/10/15	<0.20		mg/kg	
			Total Thallium (Tl)	2019/10/15	<0.10		mg/kg	
			Total Tin (Sn)	2019/10/15	<1.0		mg/kg	
			Total Uranium (U)	2019/10/15	<0.20		mg/kg	
			Total Vanadium (V)	2019/10/15	<1.0		mg/kg	

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Zinc (Zn)	2019/10/15	<10		mg/kg	
9624891	ANE	RPD	Total Aluminum (Al)	2019/10/15	0.34		%	35
			Total Antimony (Sb)	2019/10/15	NC		%	30
			Total Arsenic (As)	2019/10/15	6.2		%	30
			Total Barium (Ba)	2019/10/15	5.1		%	35
			Total Beryllium (Be)	2019/10/15	NC		%	30
			Total Boron (B)	2019/10/15	6.7		%	30
			Total Cadmium (Cd)	2019/10/15	NC		%	30
			Total Chromium (Cr)	2019/10/15	8.0		%	30
			Total Cobalt (Co)	2019/10/15	12		%	30
			Total Copper (Cu)	2019/10/15	10		%	30
			Total Iron (Fe)	2019/10/15	6.5		%	30
			Total Lead (Pb)	2019/10/15	6.8		%	35
			Total Magnesium (Mg)	2019/10/15	1.4		%	30
			Total Manganese (Mn)	2019/10/15	22		%	30
			Total Mercury (Hg)	2019/10/15	NC		%	35
			Total Molybdenum (Mo)	2019/10/15	NC		%	35
			Total Nickel (Ni)	2019/10/15	6.7		%	30
			Total Selenium (Se)	2019/10/15	NC		%	30
			Total Silver (Ag)	2019/10/15	NC		%	35
			Total Thallium (Tl)	2019/10/15	1.7		%	30
			Total Tin (Sn)	2019/10/15	NC		%	35
			Total Uranium (U)	2019/10/15	3.0		%	30
			Total Vanadium (V)	2019/10/15	2.8		%	30
			Total Zinc (Zn)	2019/10/15	6.4		%	30
9646575	EH2	QC Standard	Sieve - #200 (>0.075mm)	2019/10/29		106	%	N/A
			Sieve - Pan	2019/10/29		98	%	N/A
9646575	EH2	RPD	Sieve - #10 (>2.00mm)	2019/10/29	187 (1)		%	30
			Sieve - #200 (>0.075mm)	2019/10/29	4.4		%	30
			Sieve - Pan	2019/10/29	18		%	30
9646867	EH2	QC Standard	Sieve - #200 (>0.075mm)	2019/10/29		104	%	N/A
			Sieve - Pan	2019/10/29		99	%	N/A
9646867	EH2	RPD	Sieve - #200 (>0.075mm)	2019/10/29	42 (1)		%	30

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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BV Labs Job #: B986155
Report Date: 2019/10/29

DILLON CONSULTING LTD.
Client Project #: 19-1615
Sampler Initials: STC

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Janet Gao, B.Sc., QP, Supervisor, Organics

Luba Shymushovska, B.Sc., QP, Senior Analyst, Organics

Harry (Peng) Liang, Senior Analyst

Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.

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Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#8815 DILLON CONSULTING LTD.	Company Name		Quotation #	B70221	BV Labs Job #	Bottle Order #:
Contact Name	Shane Chapman	Contact Name		P.O. #		B986155	596128
Address	1558 Willson Place Winnipeg MB R3T 0Y4	Address		Project #	19-1615	Chain Of Custody Record	Project Manager
Phone	(204) 453-2353 Ext: 4029 Fax: (204) 452-4412	Phone	Fax:	Project Name	Churchill Dene Ph 1	C#596128-01-01	Janelle Kochan
Email	schapman@dillon.ca	Email		Site #			
				Sampled By	STC		

Regulatory Criteria

Special Instructions: 4x sample sets not used.

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to BV Labs

Analysis Requested

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT (will be applied if Rush TAT is not specified) [X]

Standard TAT = 5-7 Working days for most tests.

Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)

Date Required: _____ Time Required: _____

Rush Confirmation Number _____ (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	CCME Regulated Metals - Soils	PAH in Soil by GC/MS	AT1 BTEX and F1-F4 in Soil (Vials)	Grain Size (Sieve)							# of Bottles	Comments
1		SS19-01	19/10/02	12:30	SOIL	N	N	X	X	X	X							5	
2		SS19-02	19/10/02	12:35	SOIL	N	N	X	X	X								5	
3		SS19-03	19/10/02	12:45	SOIL	N	N	X	X	X								5	
4		SS19-04	19/10/02	13:00	SOIL	N	N	X	X	X								5	
5		SS19-05	19/10/02	13:10	SOIL	N	N	X	X	X								5	
6		SS19-06	19/10/02	13:20	SOIL	N	N	X	X	X								5	
7		SS19-07	19/10/02	13:35	SOIL	N	N	X	X	X								5	
8		SS19-08	19/10/02	13:45	SOIL	N	N	X	X	X								5	
9		SS19-09	19/10/02	14:00	SOIL	N	N	X	X	X								5	
10		SS19-10	19/10/02	14:15	SOIL	N	N	X	X	X								5	

08-Oct-19 08:15
Janelle Kochan
B986155
CUW INS-0139

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
SHANE CHAPMAN	19/10/02	19:00	BROOKLYN H	19/10/07	0800			7.0, 7.6, 6.2	Yes / No
			TINA LEWTINE	19/10/08	08:15				

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* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

MCAL: REFER TO ACTR

White: BV Labs Yellow: Client

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Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#8815 DILLON CONSULTING LTD.	Company Name		Quotation #	B70221	BV Labs Job #	Bottle Order #:
Contact Name	Shane Chapman	Contact Name		P.O. #		B986155	596128
Address	1558 Willson Place Winnipeg MB R3T 0Y4	Address		Project #	19-1615	Chain Of Custody Record	Project Manager
Phone	(204) 453-2353 Ext: 4029 Fax: (204) 452-4412	Phone	Fax:	Project Name	Churchill Dene Ph I	C#596128-02-01	Janelle Kochan
Email	schapman@dillon.ca	Email		Site #			
				Sampled By	STC		

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to BV Labs

Analysis Requested

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	CCME Regulated Metals - Soils	PAH in Soil by GC/MS	AT1 BTEX and F1-F4 in Soil (Vials)	Grain Size (Sieve)							# of Bottles	Comments
1		SS19-11	19/10/02	14:30	SOIL	N	N	X	X	X								5	
2		SS19-12	19/10/02	14:45	SOIL	N	N	X	X	X								5	
3		SS19-13	19/10/03	9:30	SOIL	N	N	X	X	X	X							5	
4		SS19-14	19/10/03	9:35	SOIL	N	N	X	X	X								5	
5		SS19-15	19/10/03	9:50	SOIL	N	N	X	X	X								5	
6		SS19-16	19/10/03	10:00	SOIL	N	N	X	X	X								5	
7		SS19-17	19/10/03	10:05	SOIL	N	N	X	X	X								5	
8		SS19-18	19/10/03	10:15	SOIL	N	N	X	X	X								5	
9		SS19-19	19/10/03	10:25	SOIL	N	N	X	X	X								5	
10		SS19-20	19/10/03	10:35	SOIL	N	N	X	X	X								5	

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT [X]
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission) [ ]
Date Required: _____ Time Required: _____
Rush Confirmation Number _____
(call lab for #)

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
SHANE CHAPMAN	19/10/03	19:00	BH Brooklyn H	19/10/07	0800	
			TINA WHITTLE	19/10/08	08:15	

Lab Use Only		
Time Sensitive [ ]	Temperature (°C) on Receipt: 7.0 7.6 6.2	Custody Seal Intact on Cooler? [ ] Yes [ ] No

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MCAL: REFER TO ACTR

White: BV Labs Yellow: Client

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Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#8815 DILLON CONSULTING LTD.	Company Name		Quotation #	B70221	BV Labs Job #	Bottle Order #:
Contact Name	Shane Chapman	Contact Name		P.O. #		B986155	596128
Address	1558 Willson Place Winnipeg MB R3T 0Y4	Address		Project #	19-1615	Chain Of Custody Record	Project Manager
Phone	(204) 453-2353 Ext: 4029 Fax: (204) 452-4412	Phone	Fax:	Project Name	Churchill Dene Ph 1	C#596128-03-01	Janelle Kochan
Email	schapman@dillon.ca	Email		Site #			
				Sampled By	STC		

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10ºC) from time of sampling until delivery to BV Labs

Analysis Requested

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	CCME Regulated Metals - Soils	PAH in Soil by GC/MS	AT1 BTEX and F1-F4 in Soil (Vials)	VOCs	Grain Size (Sieve)						# of Bottles	Comments
1		SS19-21	19/10/03	10:45	SOIL	N	N	X	X	X								5	
2		SS19-22	19/10/03	10:50	SOIL	N	N	X	X	X								5	
3		SS19-23	19/10/03	10:55	SOIL	N	N	X	X	X								5	
4		SS19-24	19/10/03	11:00	SOIL	N	N	X	X	X		X						5	
5		SS19-25	19/10/03	11:05	SOIL	N	N	X	X	X								5	
6		SS19-26	19/10/03	11:10	SOIL	N	N	X	X	X								5	
7		SS19-27	19/10/03	11:20	SOIL	N	N	X	X	X								5	
8		SS19-28	19/10/03	11:30	SOIL	N	N	X	X	X								5	
9		SS19-29	19/10/03	11:45	SOIL	N	N	X		X	X							5	
10		SS19-30	19/10/03	15:00	SOIL	N	N	X	X	X								5	

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT X
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____
Rush Confirmation Number _____
(call lab for #)

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
SHANE CHAPMAN	19/10/03	19:00	BA Brookwin.H	19/10/07	0800	
			TINA WHITE	19/10/08	08:15	

Lab Use Only: Time Sensitive ☐ Temperature (ºC) on Receipt 7.0 7.6 6.2 Custody Seal Intact on Cooler? ☐ Yes ☐ No

MCAL: REFER TO ACTR

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2602

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#8815 DILLON CONSULTING LTD.	Company Name		Quotation #	B70221	BV Labs Job #	Bottle Order #: 596128
Contact Name	Shane Chapman	Contact Name		P.O. #			
Address	1558 Willson Place, Winnipeg MB R3T 0Y4	Address		Project #	19-1615	Chain Of Custody Record	Project Manager
Phone	(204) 453-2353 Ext: 4029 Fax: (204) 452-4412	Phone	Fax:	Project Name	Churchill Rene Ph 1	C#596128-04-01	Janelle Kochan
Email	schapman@dillon.ca	Email		Site #			
				Sampled By	STC		

Regulatory Criteria

Special Instructions

Analysis Requested

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to BV Labs

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	CCME Regulated Metals - Soils	PAH in Soil by GC/MS	AT1 BTEX and F1-F4 in Soil (Vials)	# of Bottles	Comments
1		SS19-31	19/10/03	15:15	SOIL	N	N	X	X	X	5	
2		SS19-32	19/10/03	15:30	SOIL	N	N	X	X	X	5	
3		SS19-33	19/10/03	15:40	SOIL	N	N	X	X	X	5	
4		~~SS19-34~~									~~5~~	
5		~~SS19-35~~									~~5~~	
6		~~SS19-36~~									~~5~~	
7		~~SS19-37~~									~~5~~	
8											~~5~~	
9											~~5~~	
10											~~5~~	

08-Oct-19 08:15
Janelle Kochan
B986155
CUW INS-0139

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT [X]
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission) [ ]
Date Required: _____ Time Required: _____
Rush Confirmation Number _____ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
SHANE CHAPMAN	19/10/03	19:00	BH Brooklyn.A	19/10/07	0800	
			TINA LUWTIDE	19/10/08	08:15	

Lab Use Only

Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
[ ]	7.0 7.6 6.2	[ ] Yes [ ] No

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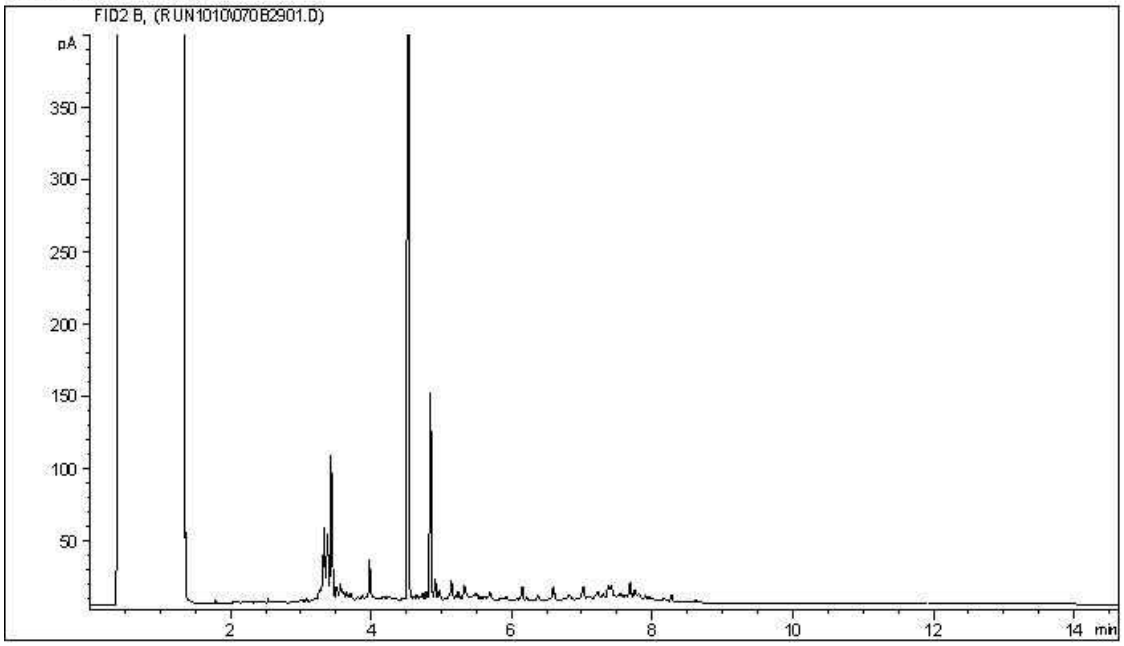
MCAL: REFER TO ACR

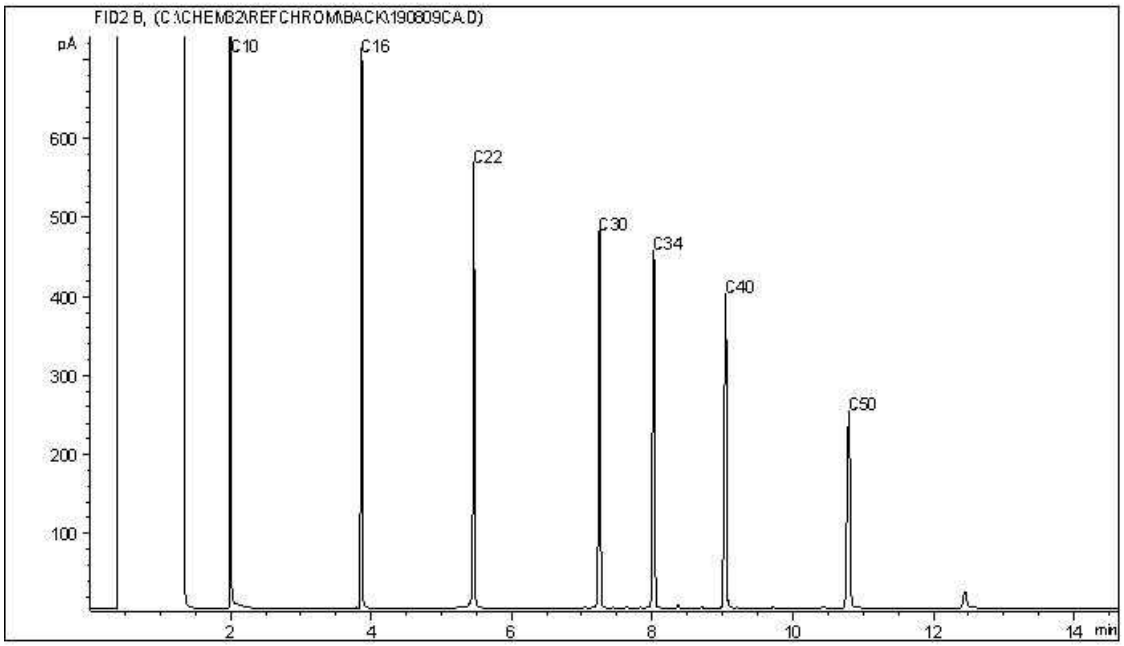
White: BV Labs Yellow: Client

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



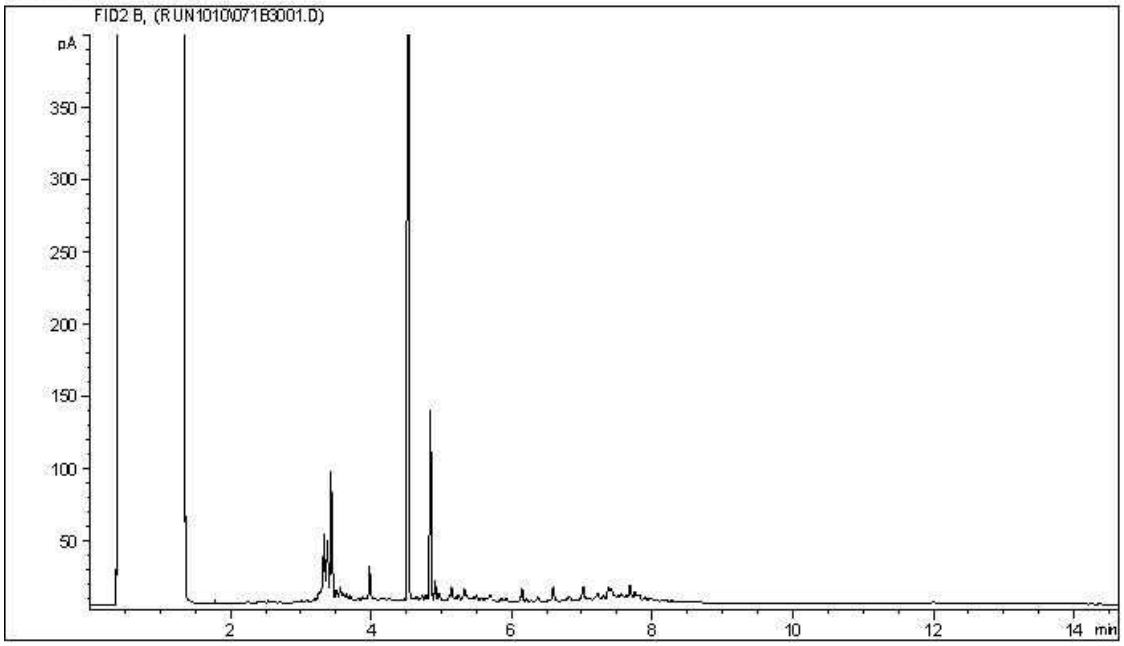
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

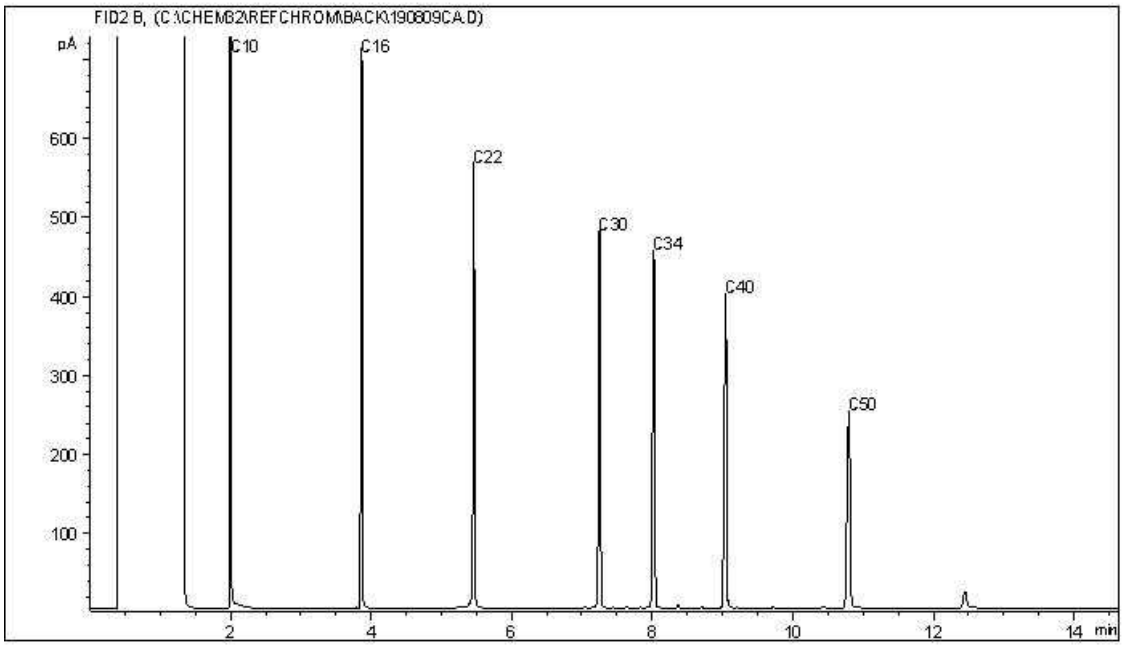
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

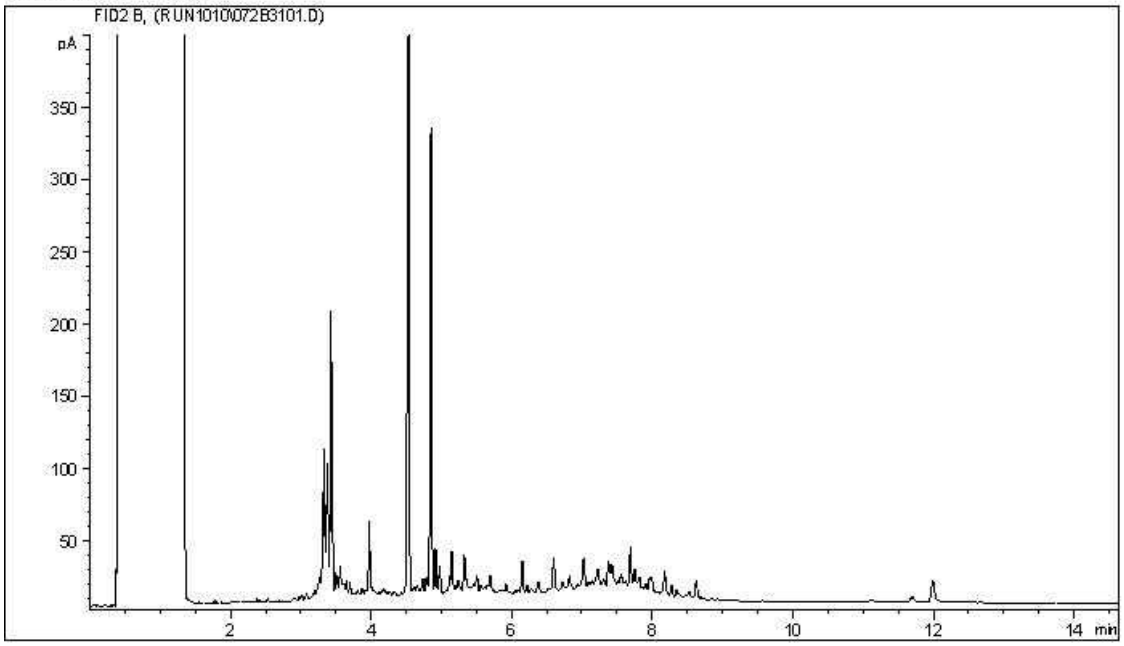
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ8969

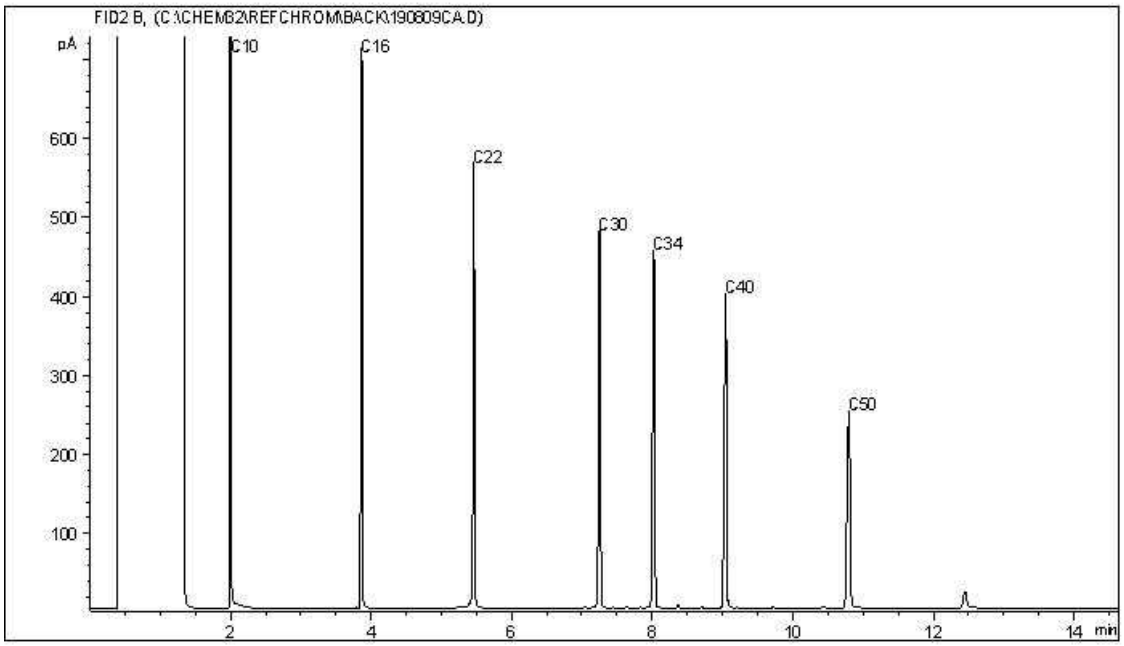
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-03

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

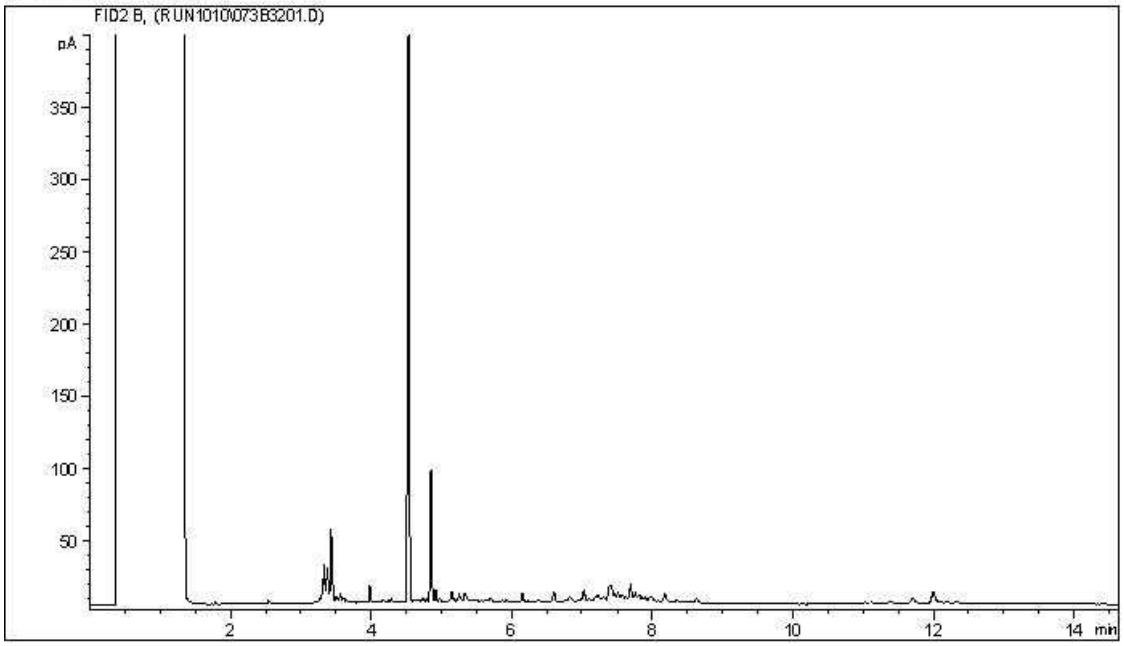
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ8970

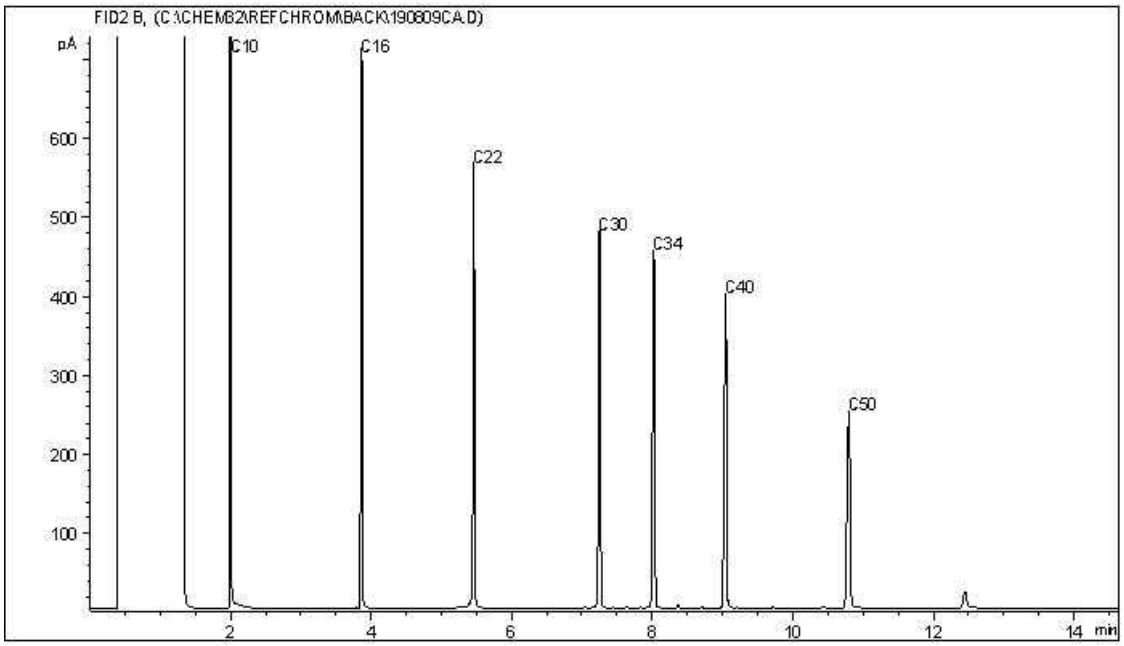
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-04

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

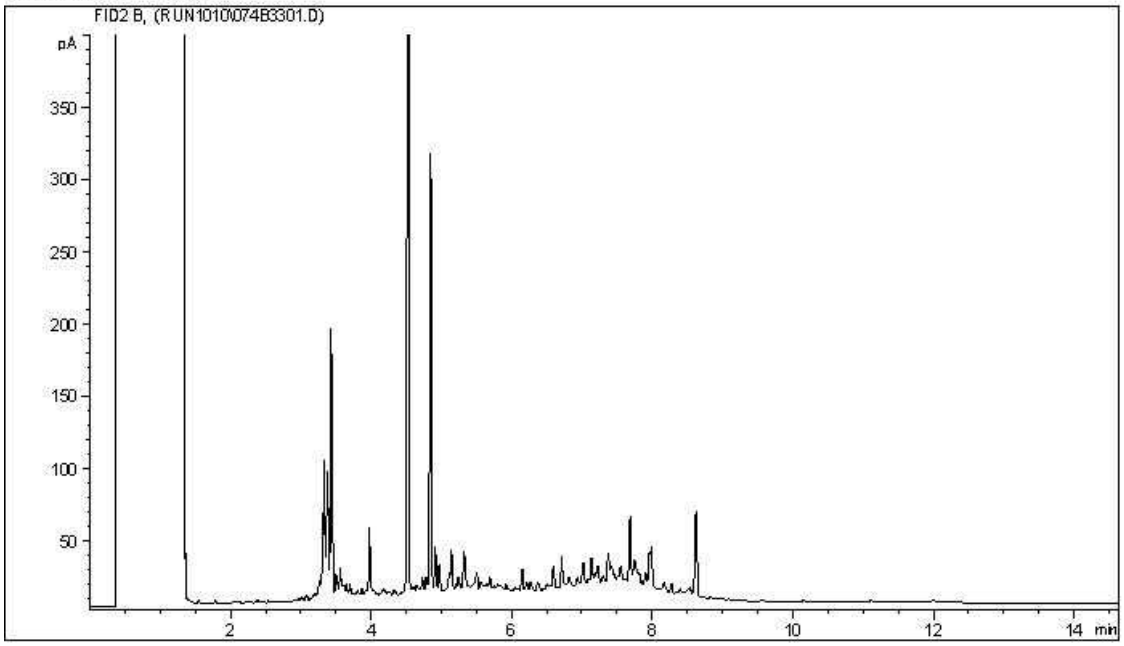
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ8971

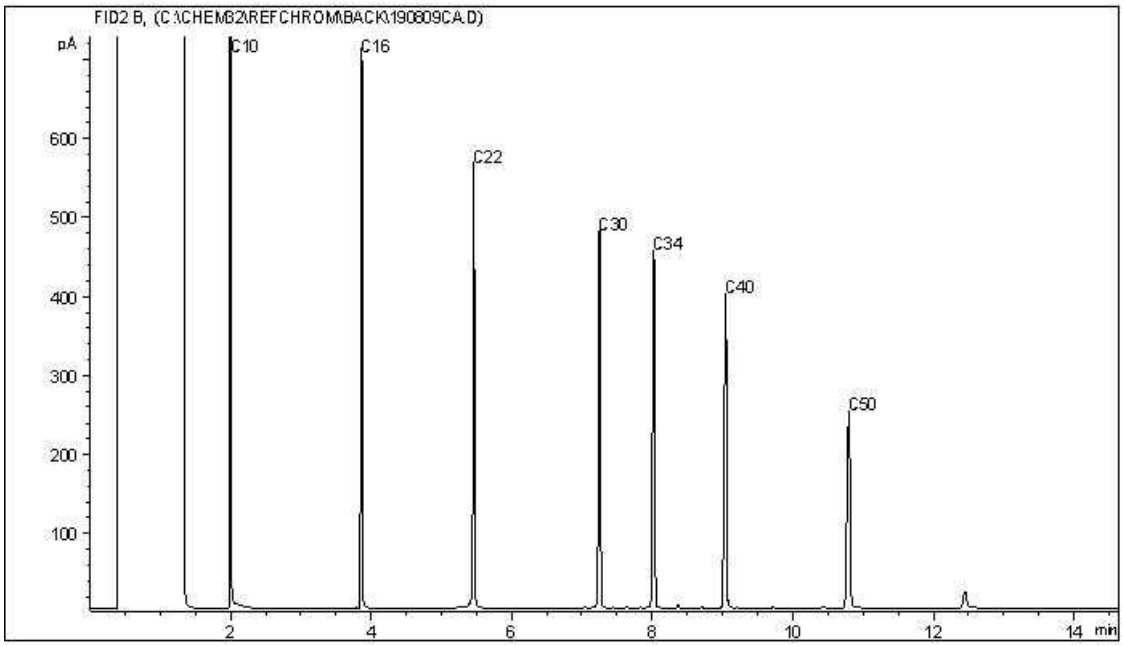
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-05

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



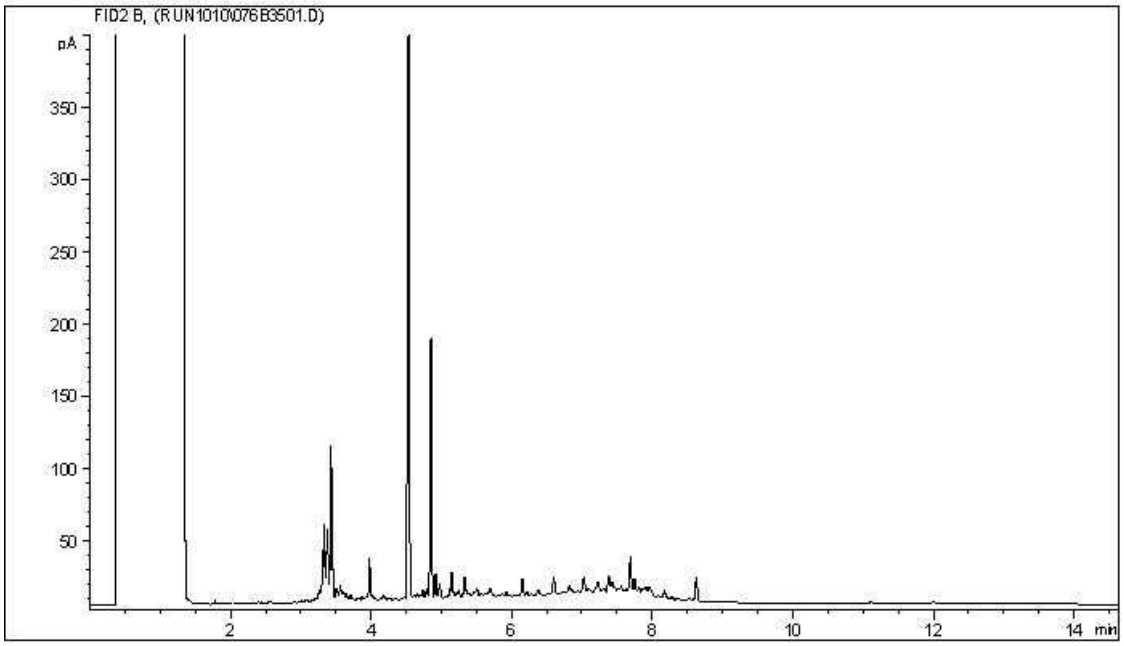
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

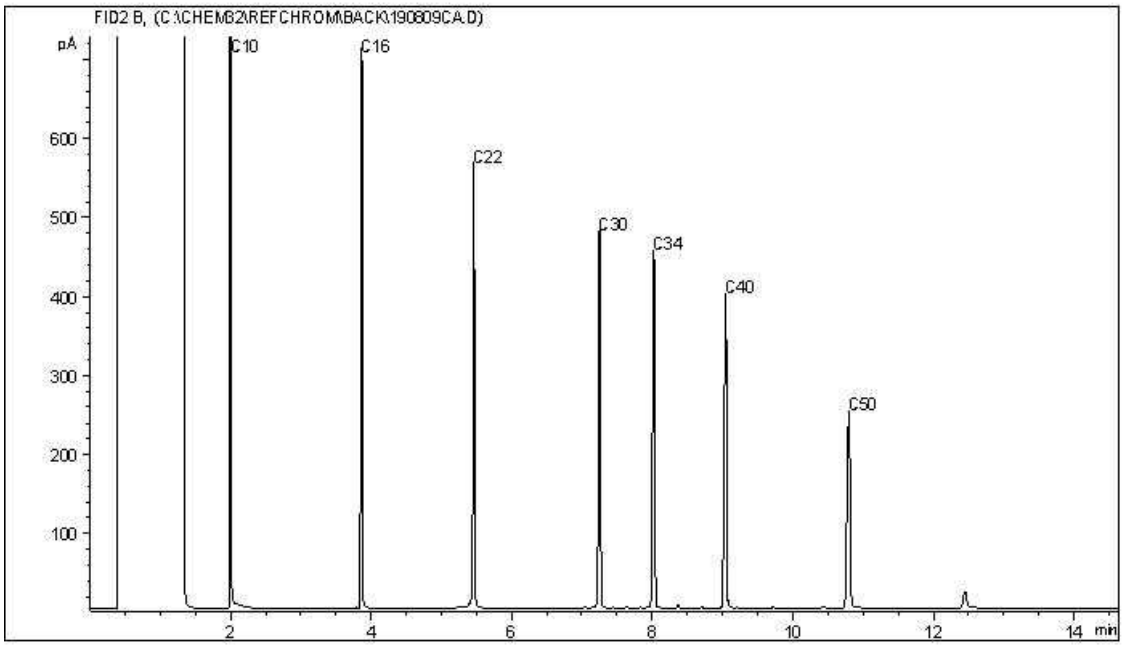
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



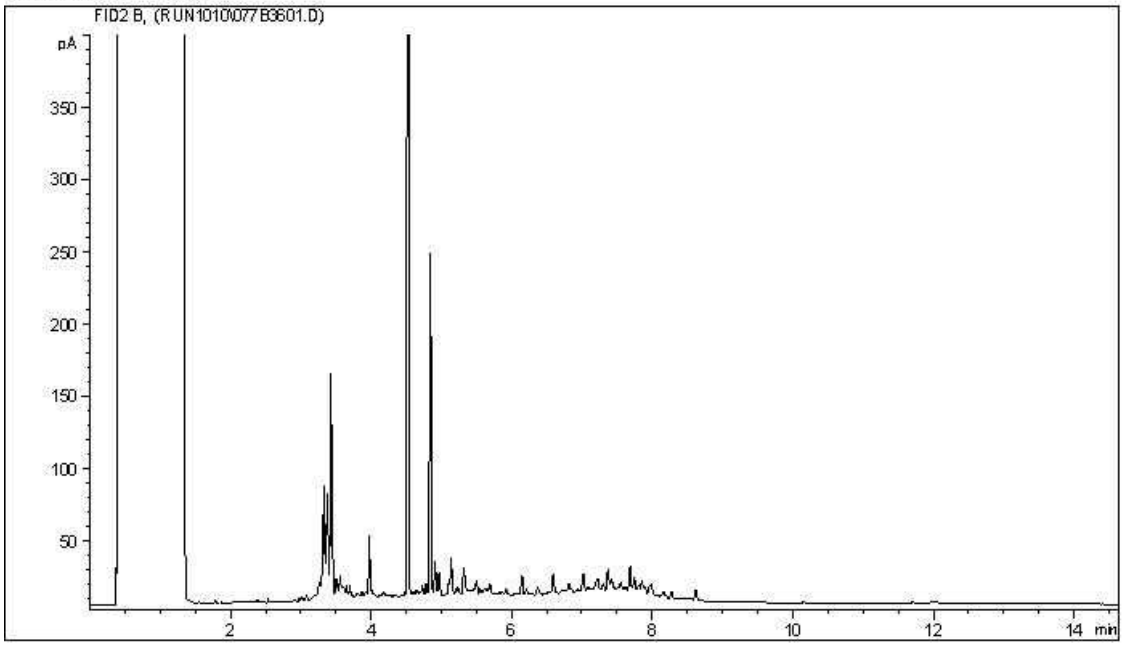
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

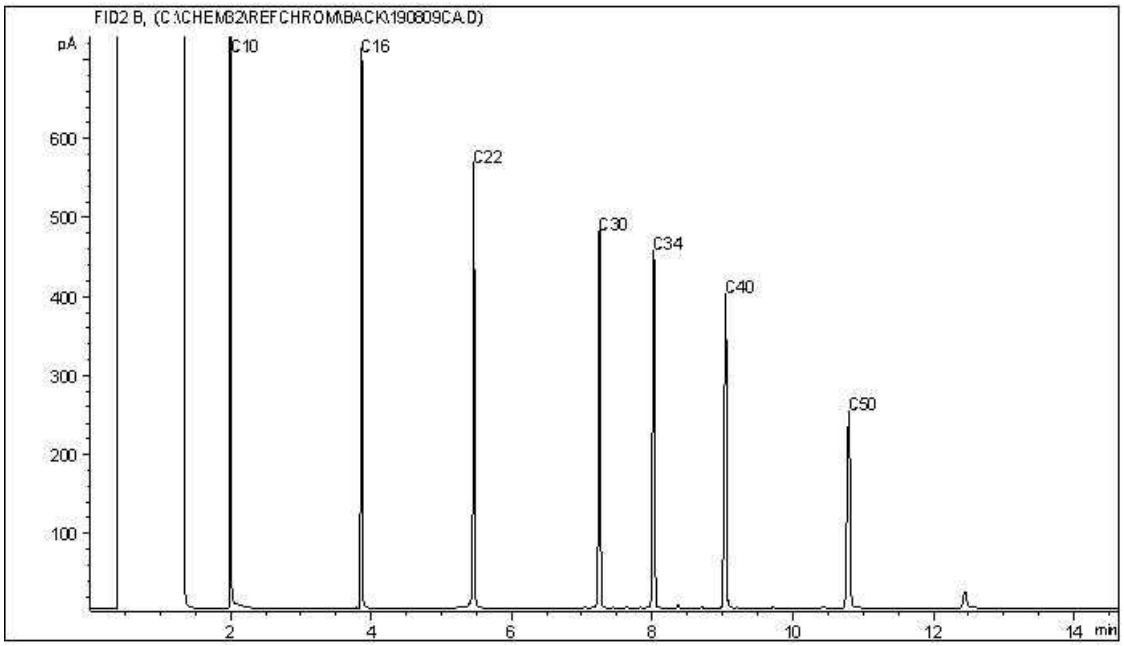
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

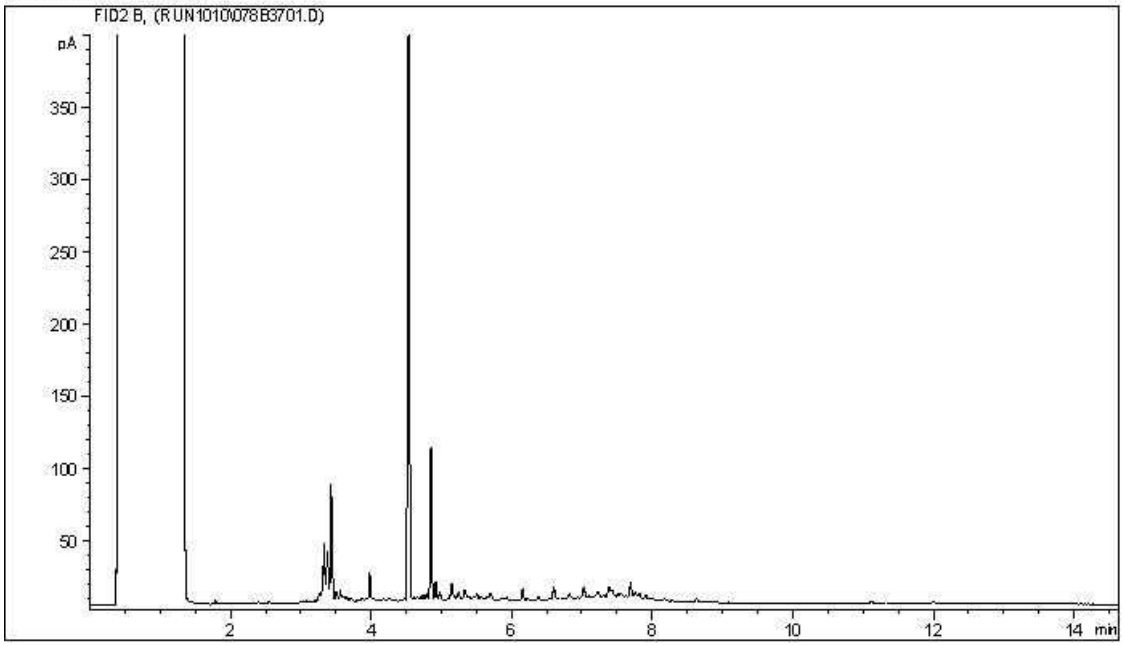
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ8974

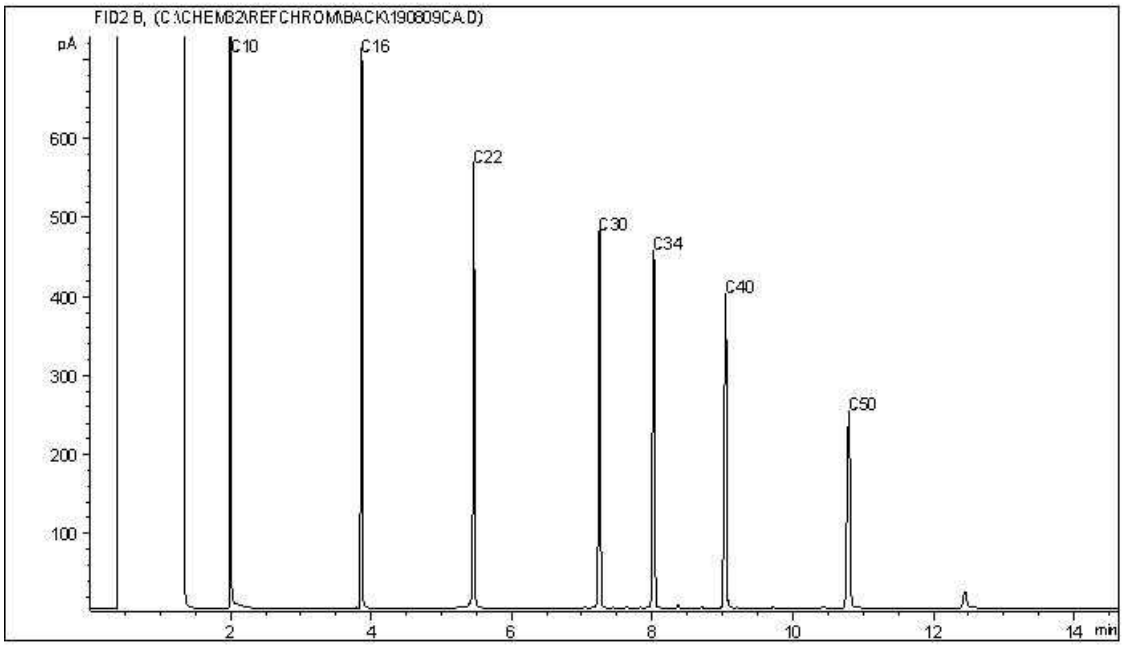
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-08

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

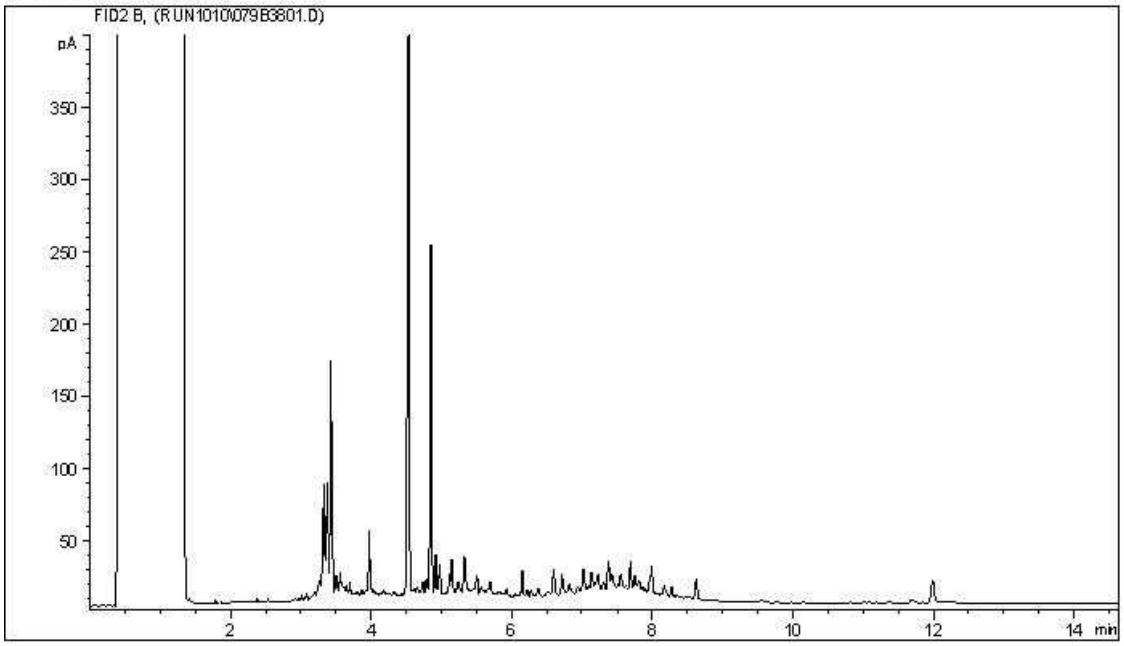
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ8975

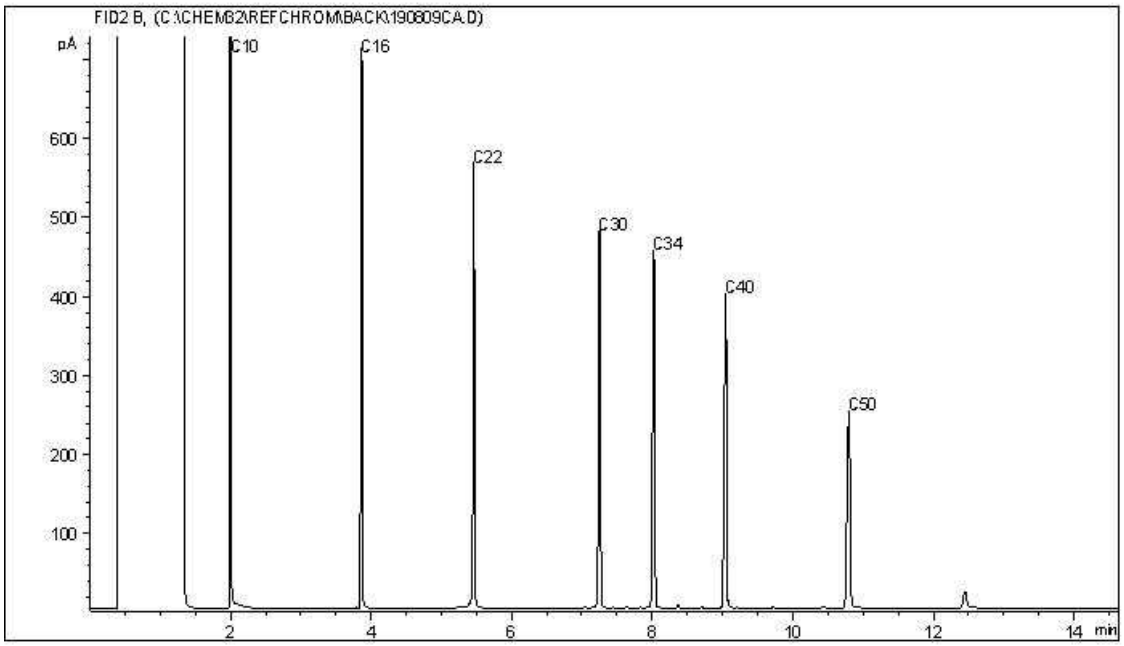
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-09

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

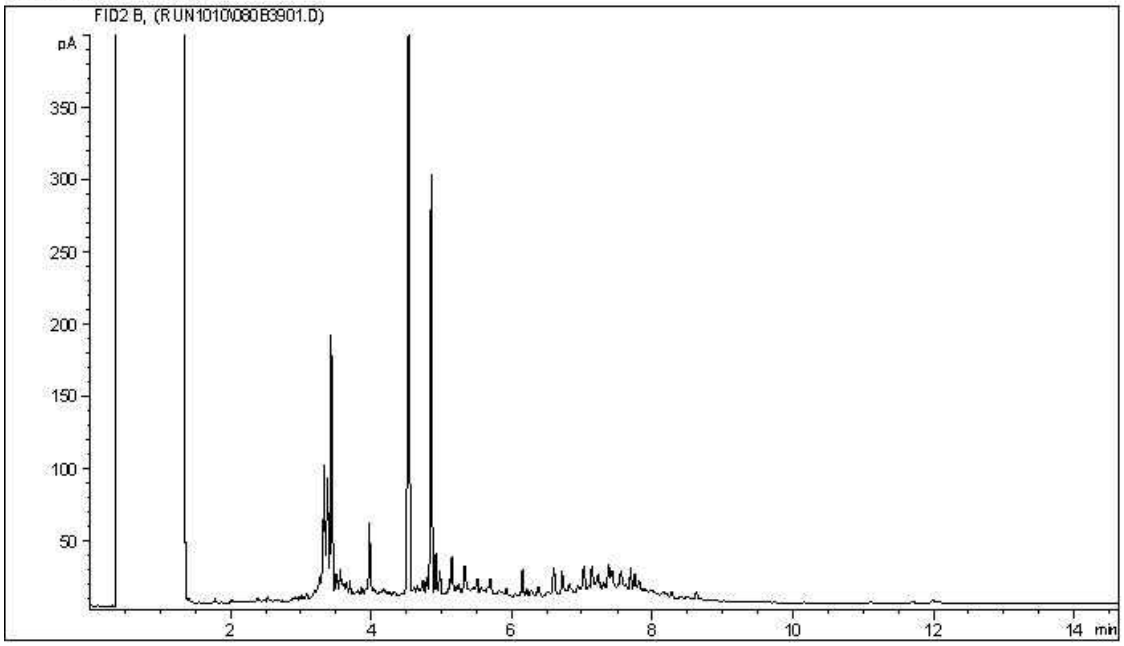
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ8976

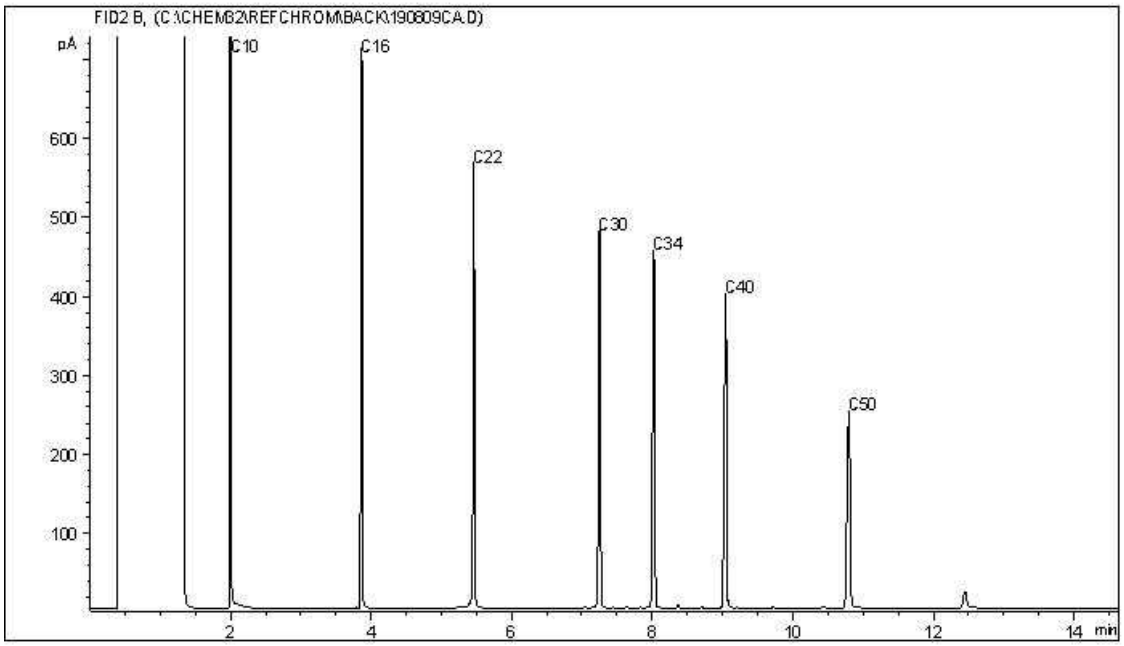
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-10

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

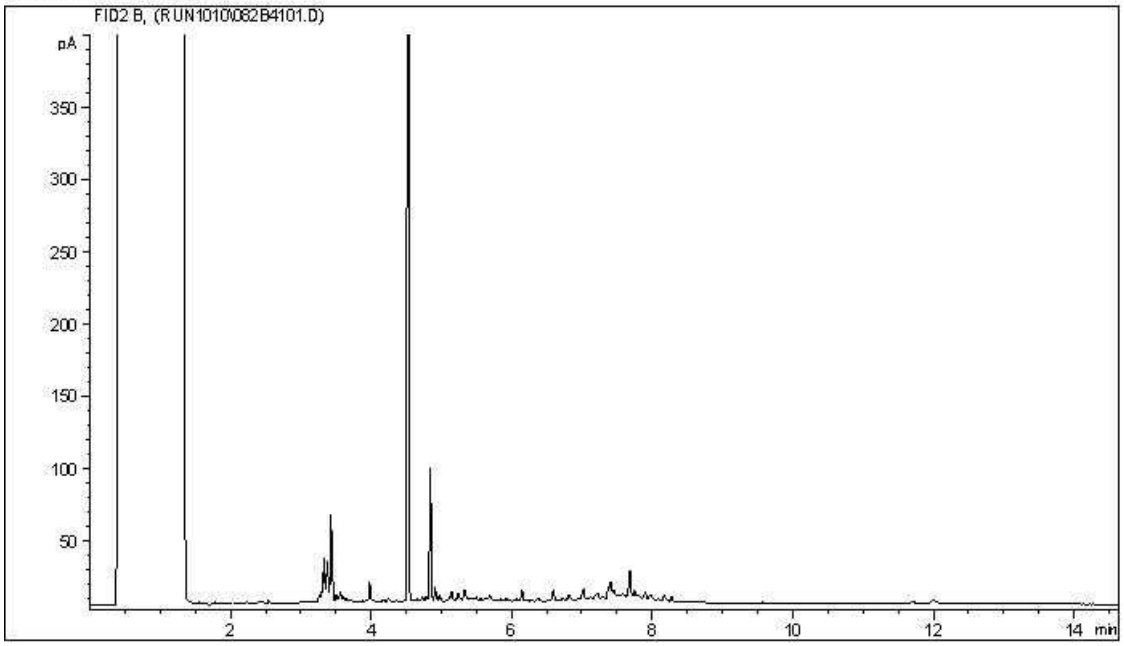
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ8979

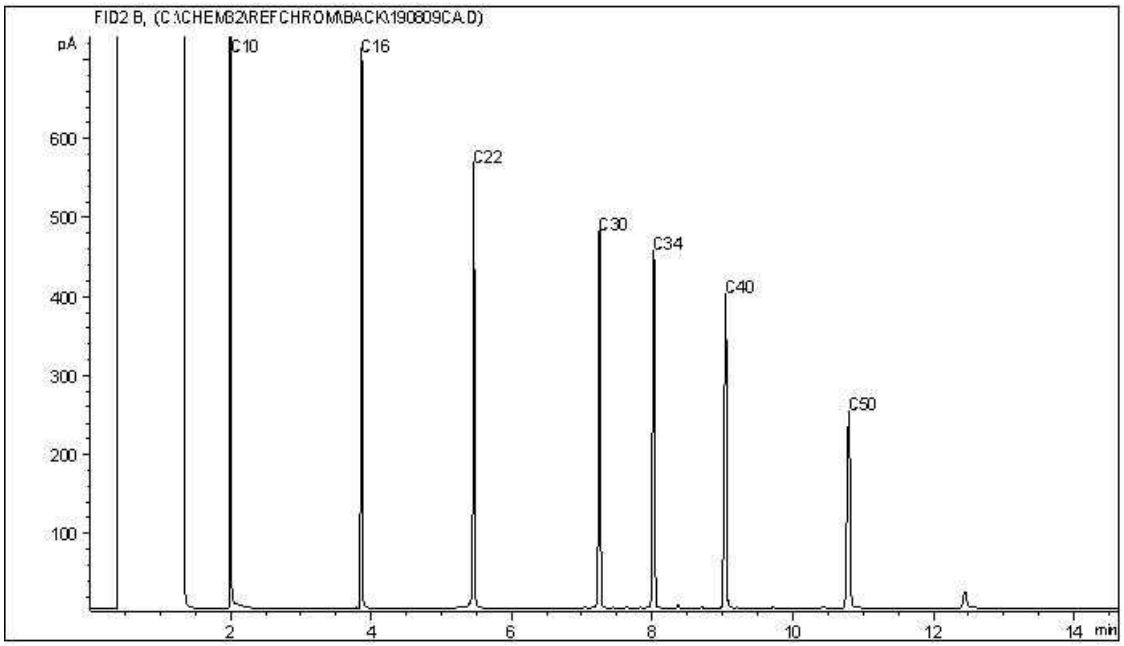
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-11

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

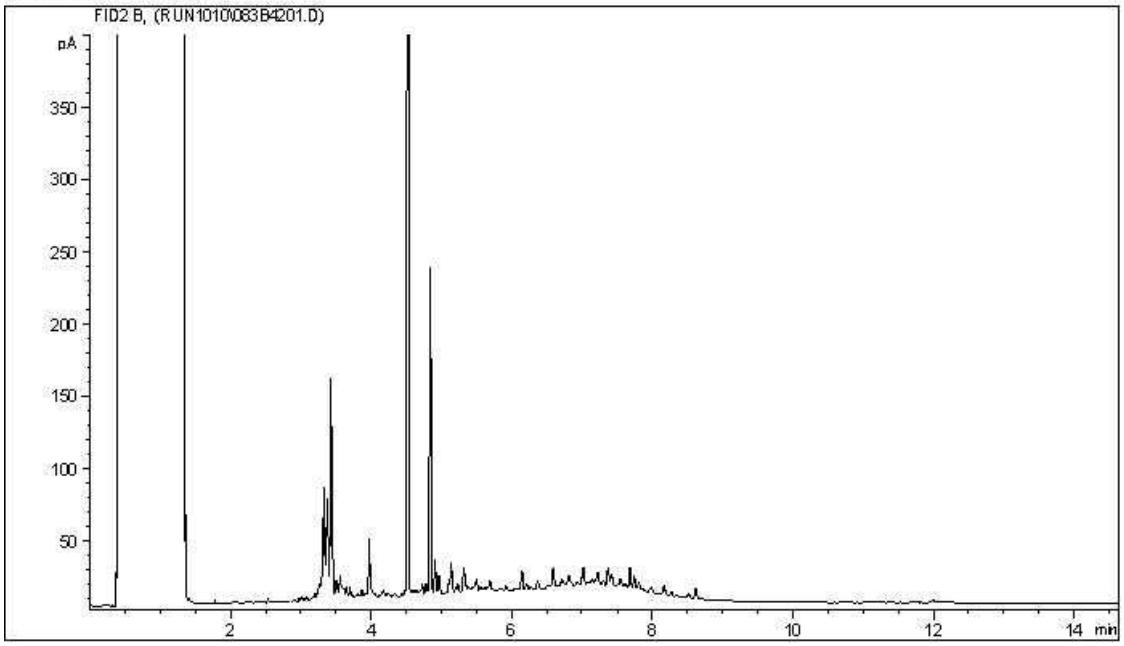
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ8980

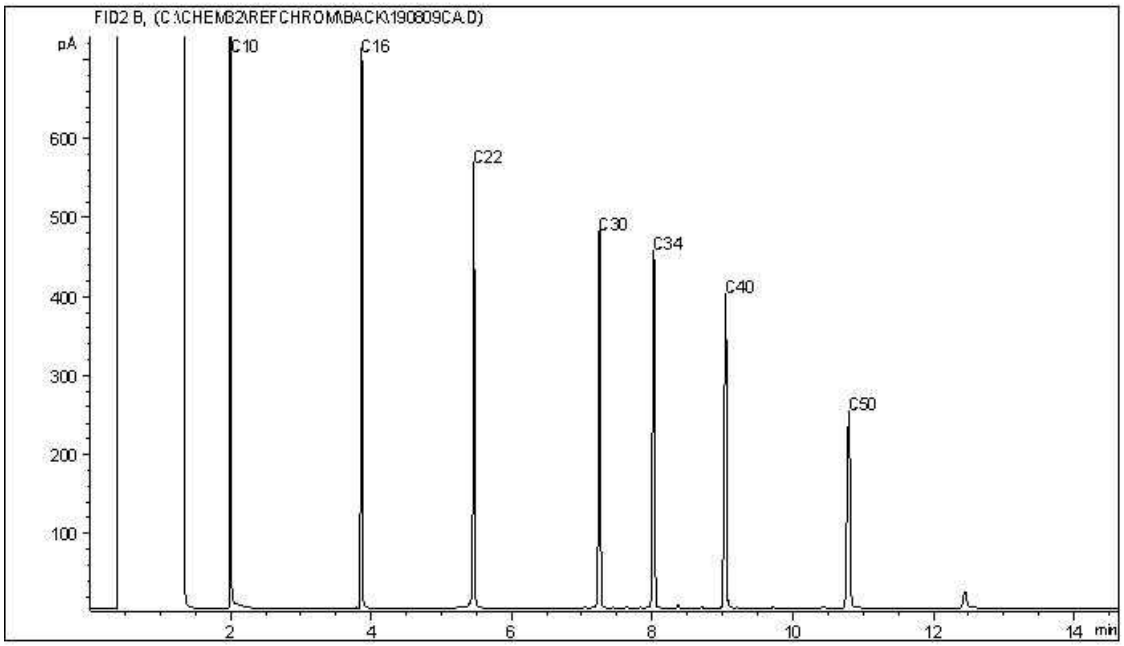
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-12

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

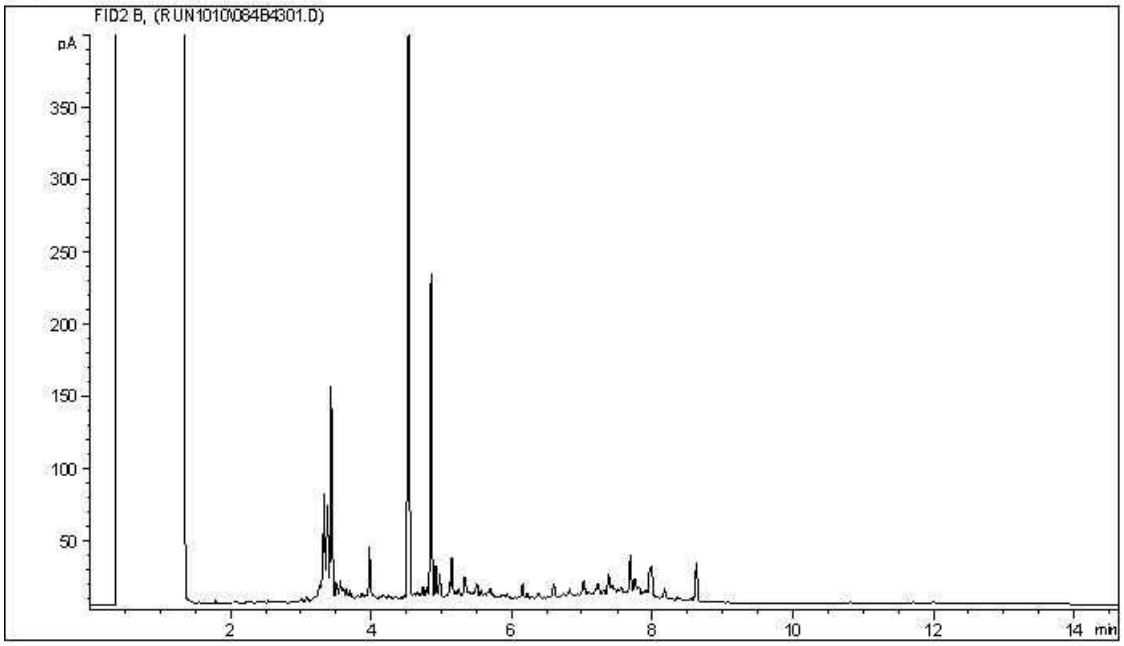
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ8981

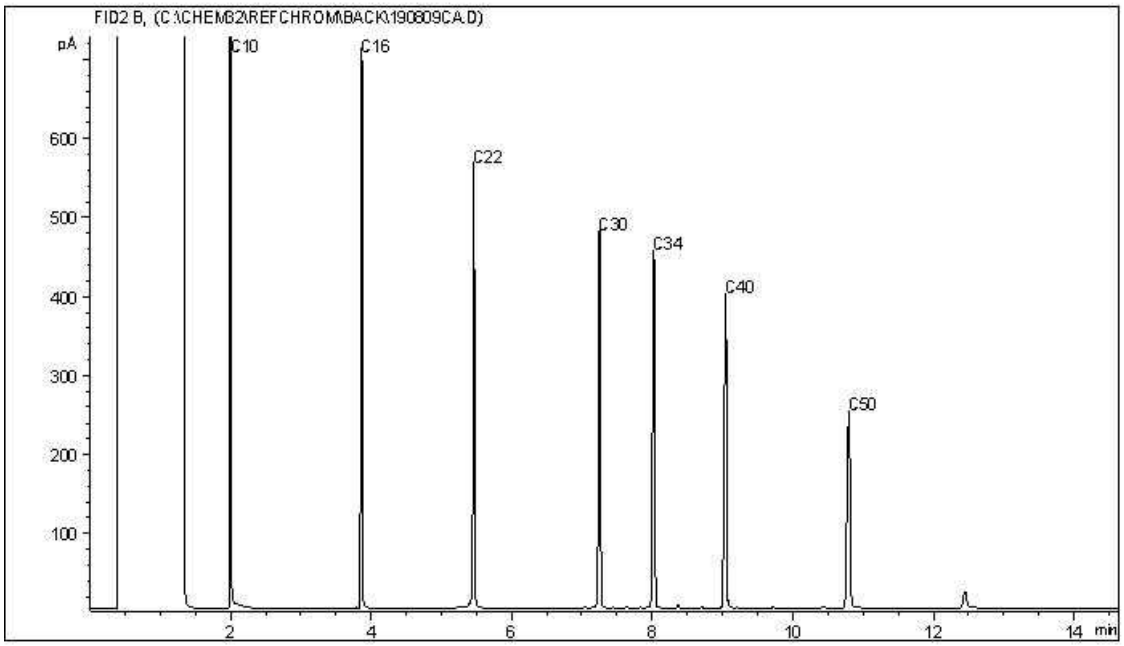
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-13

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



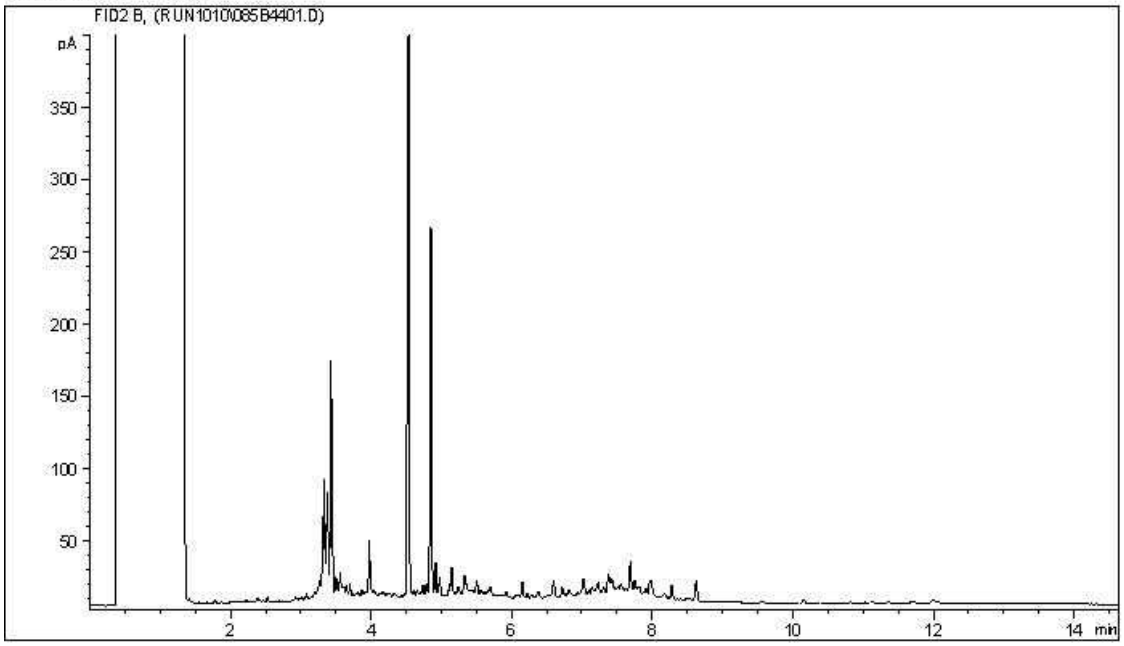
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

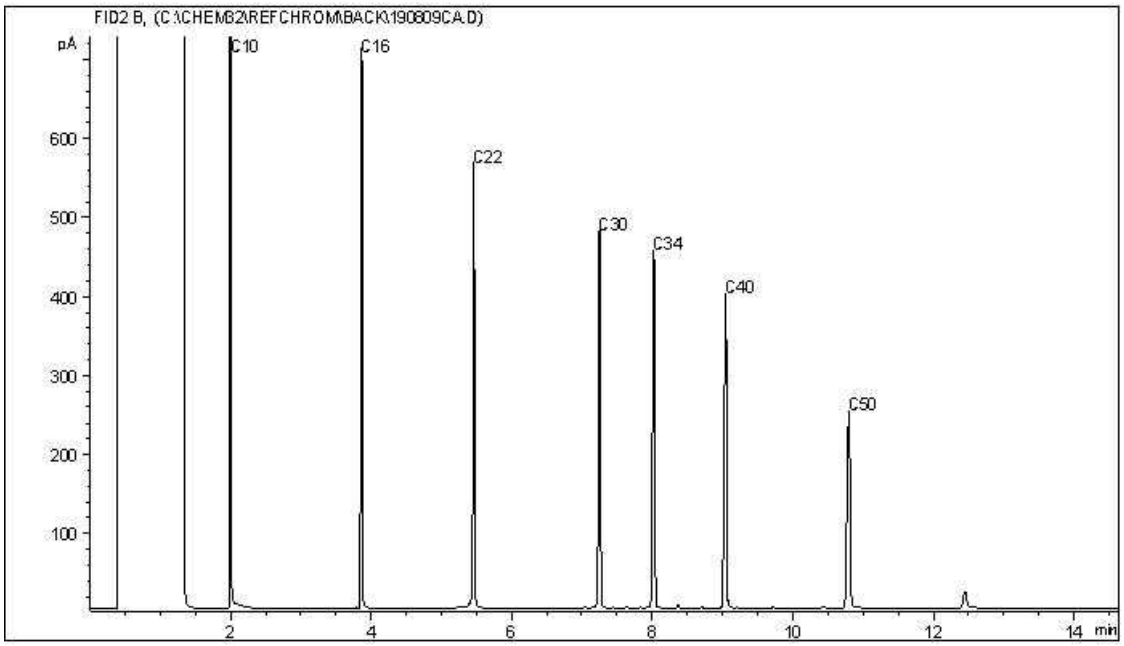
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



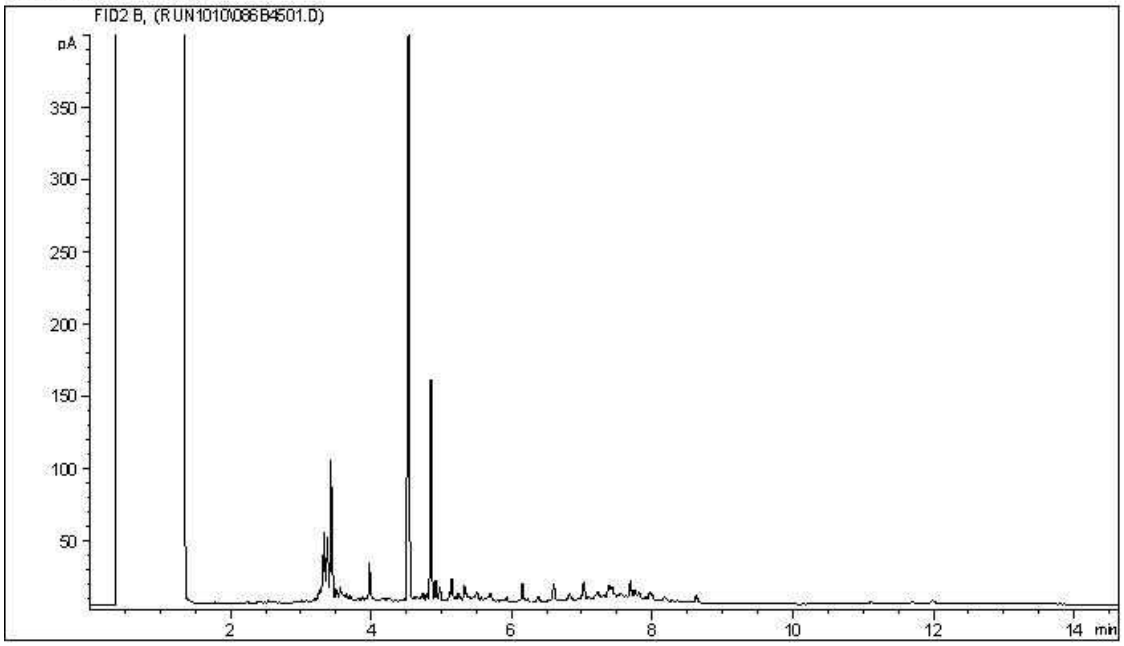
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

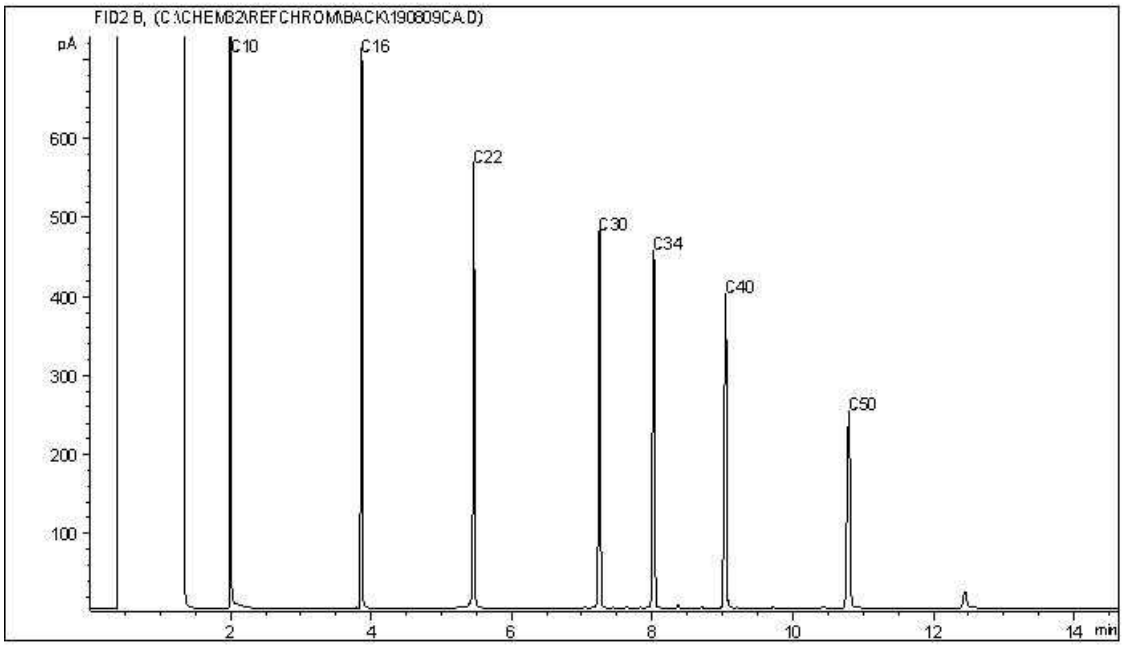
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

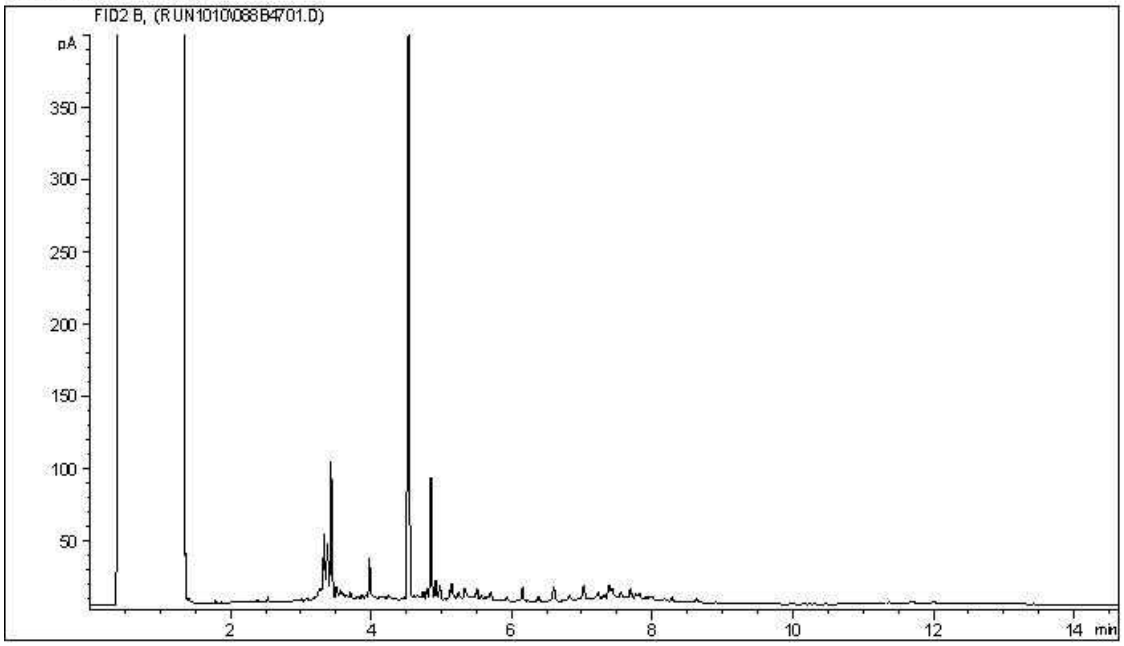
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ8984

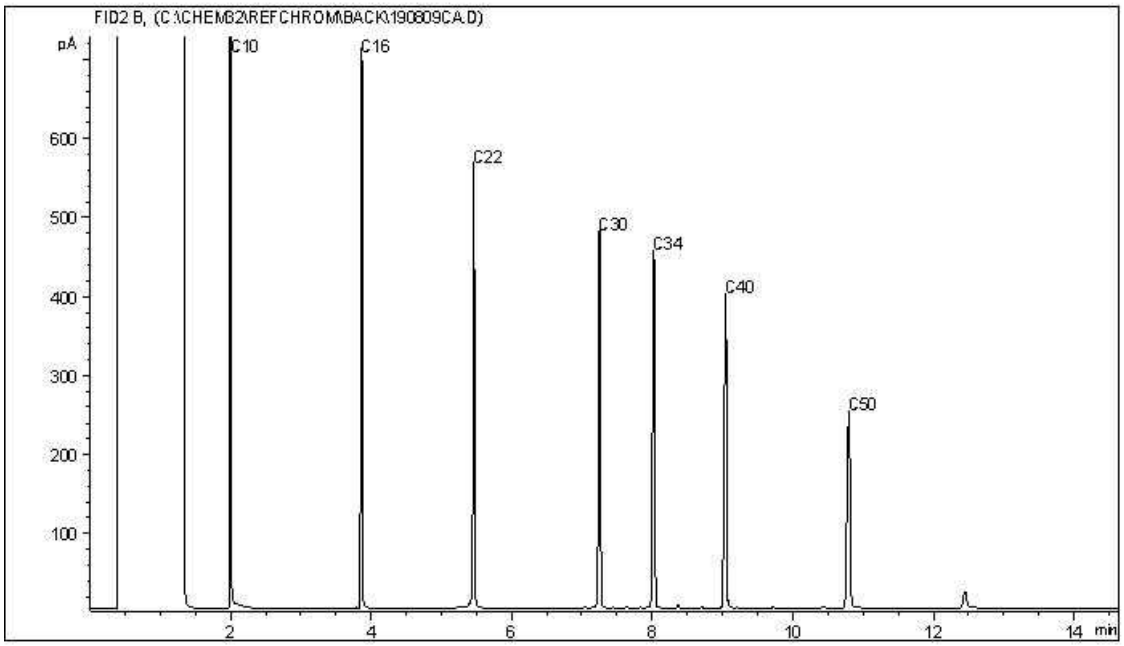
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-16

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



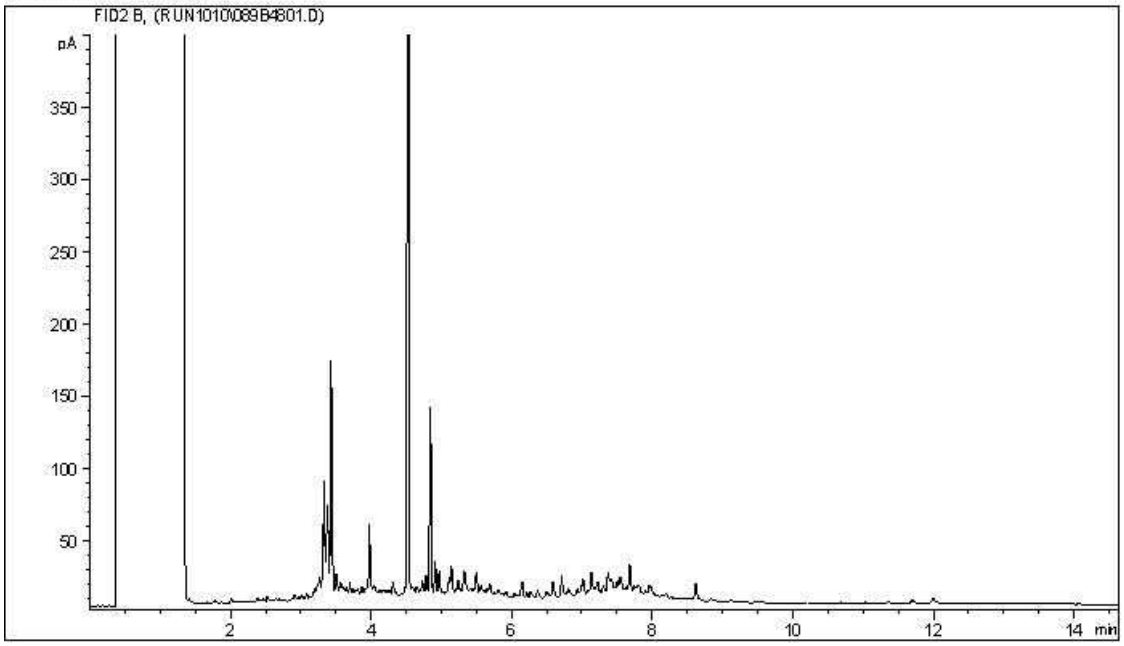
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

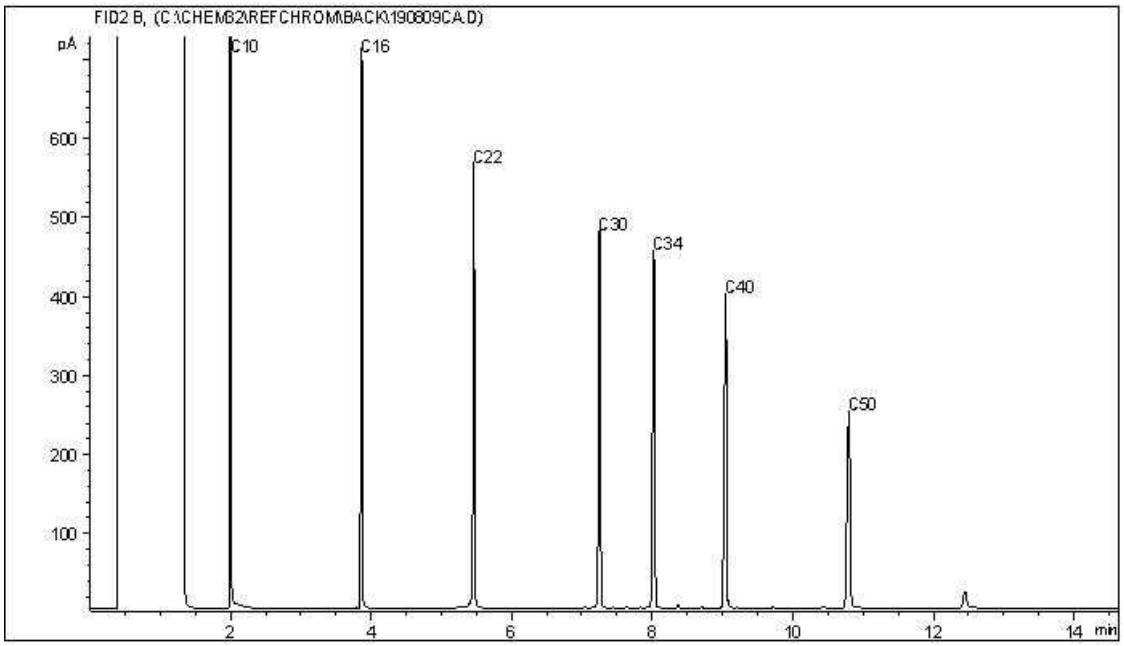
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

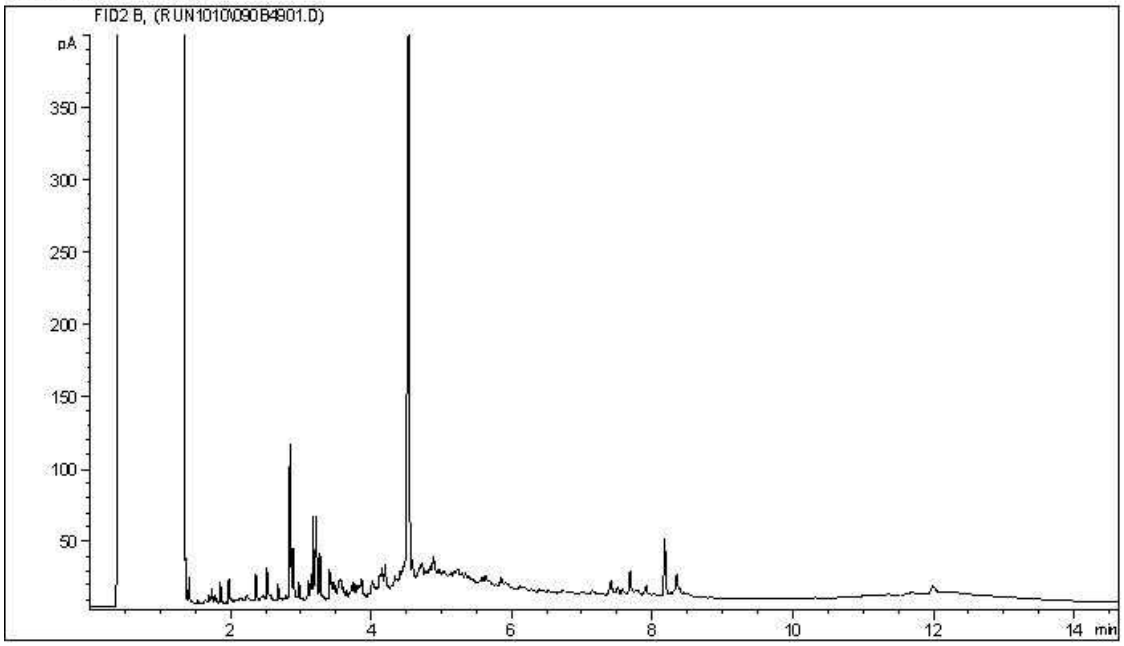
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ8986

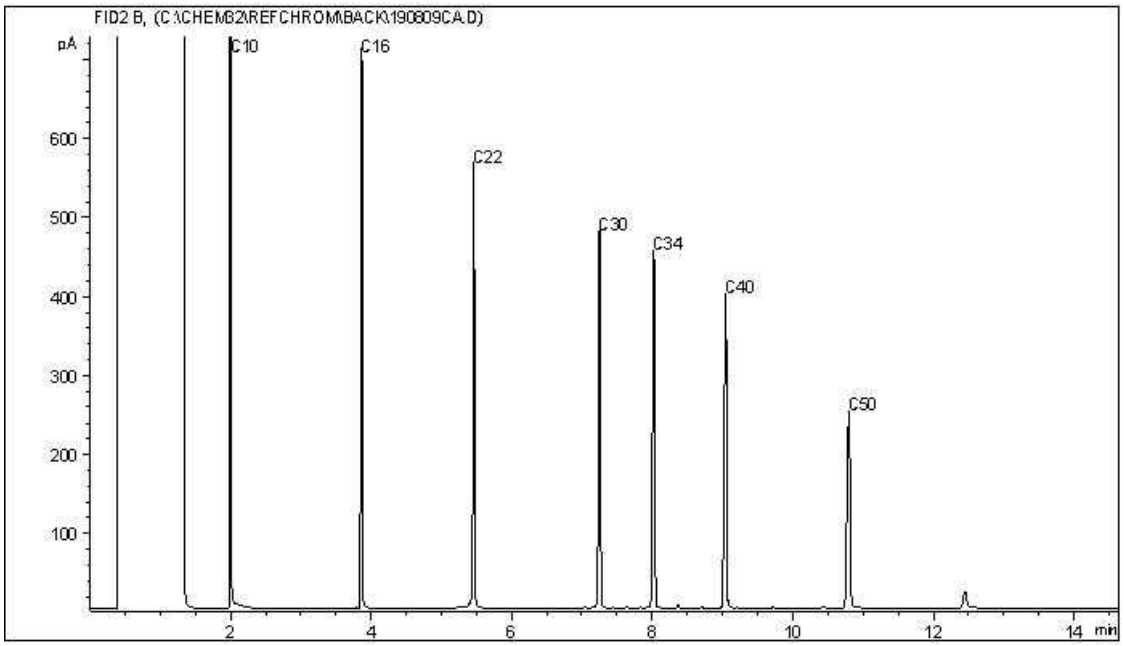
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-18

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

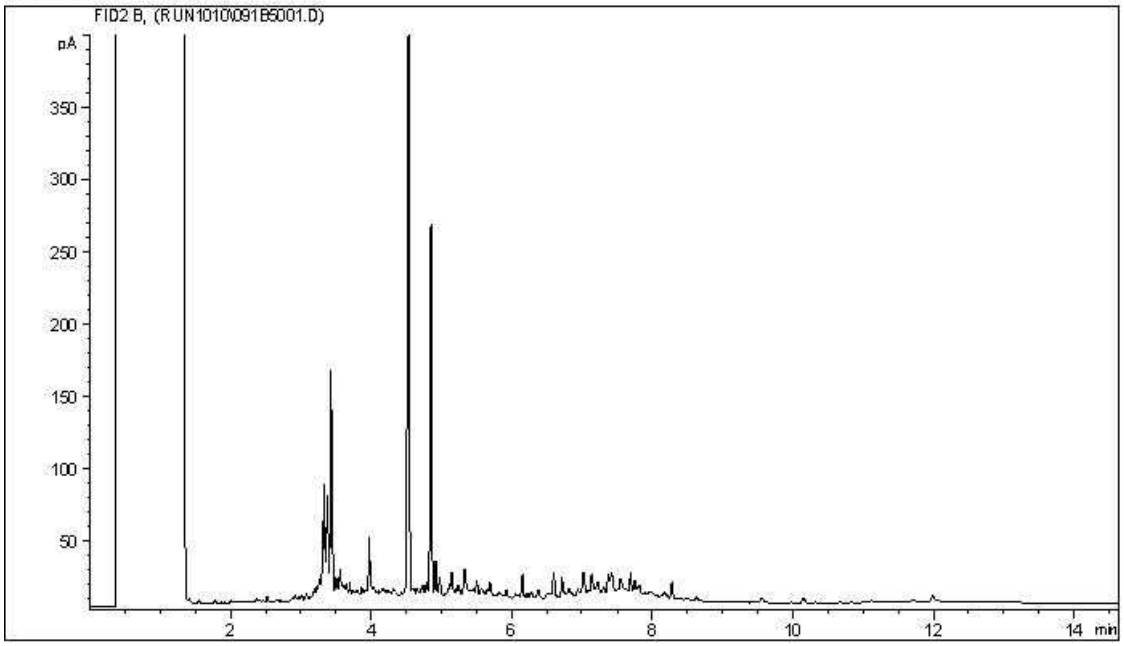
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ8987

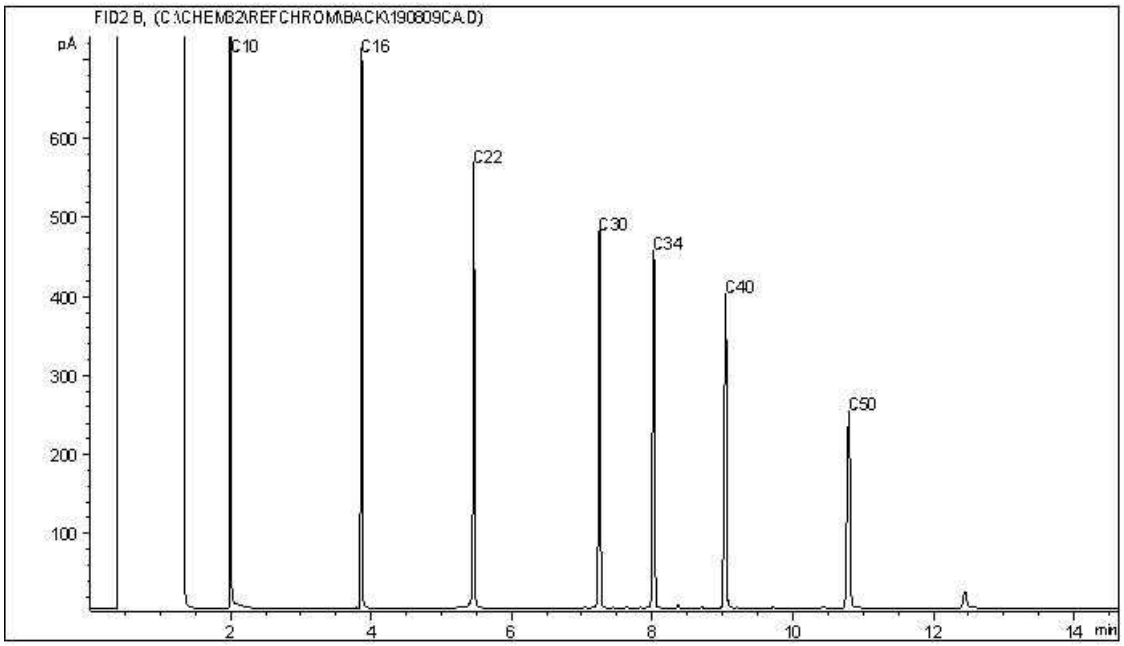
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-19

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

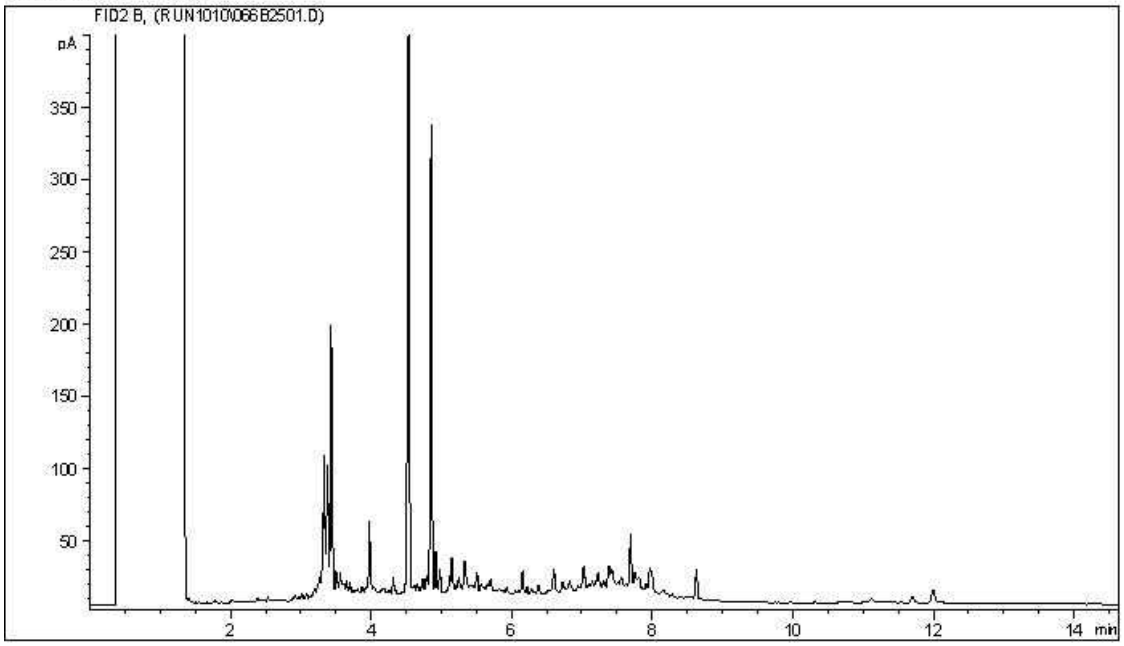
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ8988

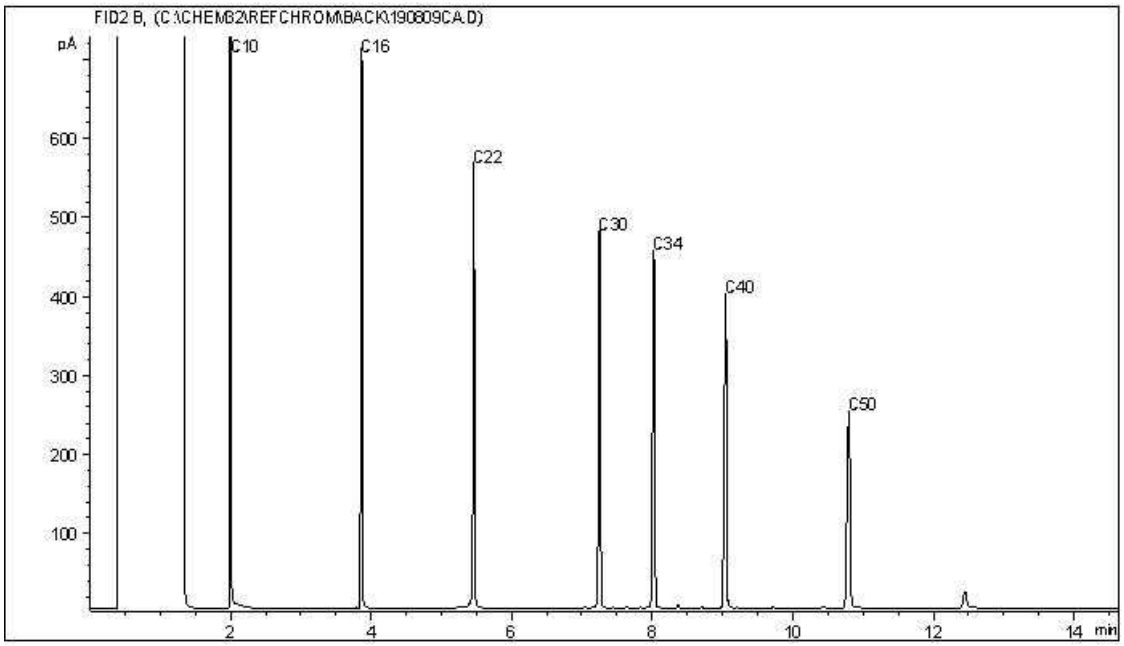
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-20

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

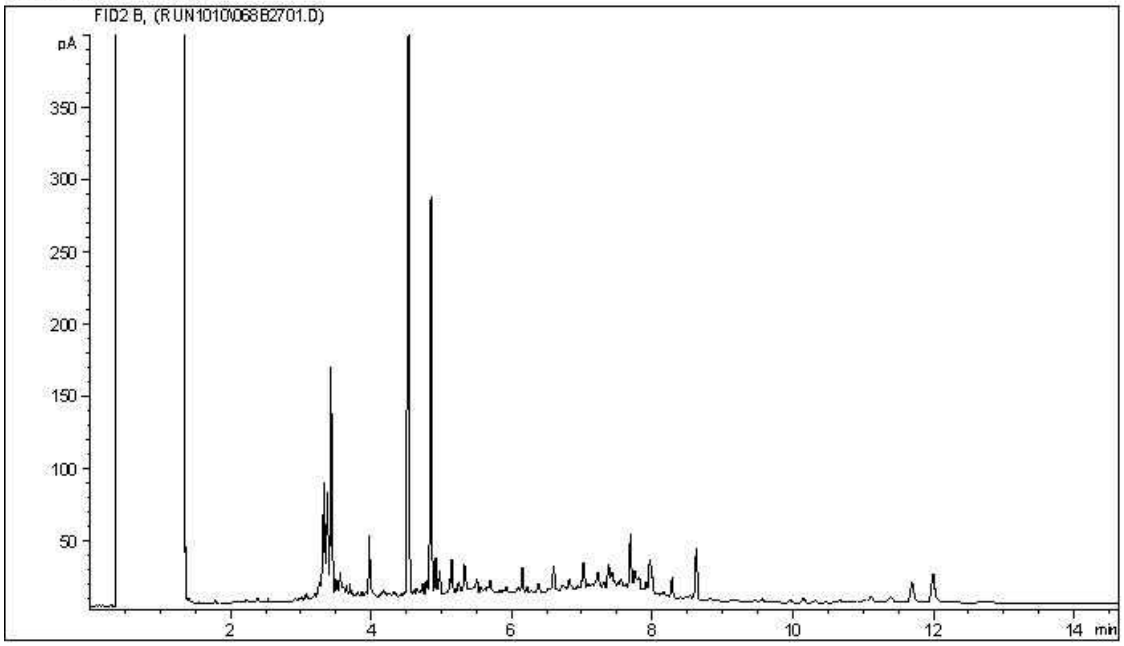
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ8988 Lab-Dup

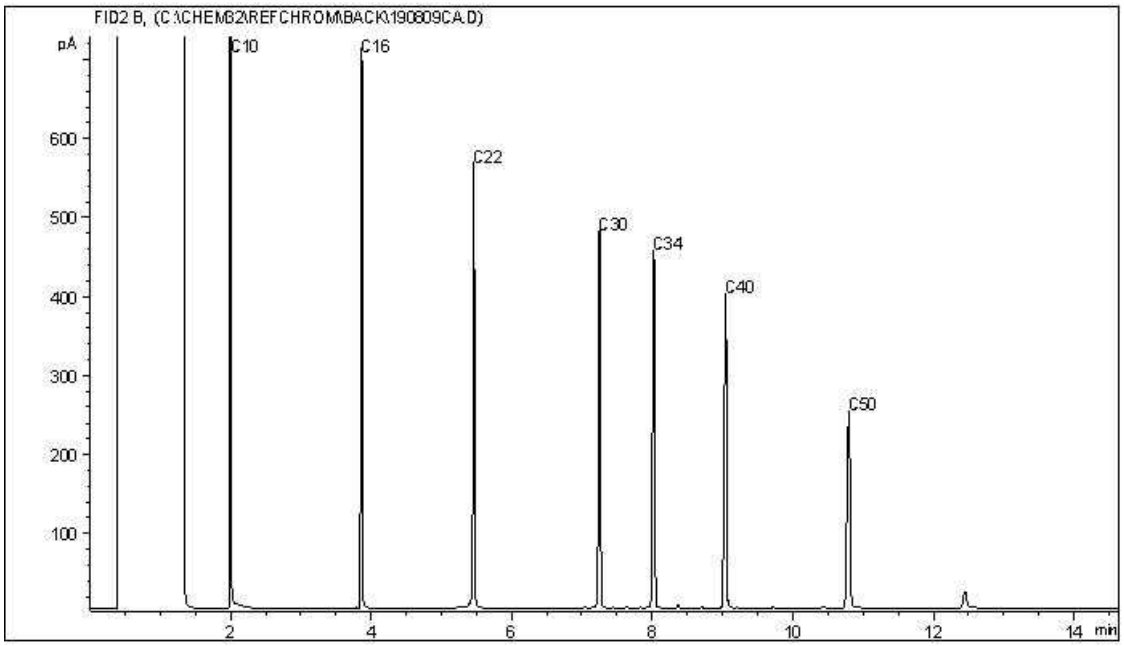
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-20

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



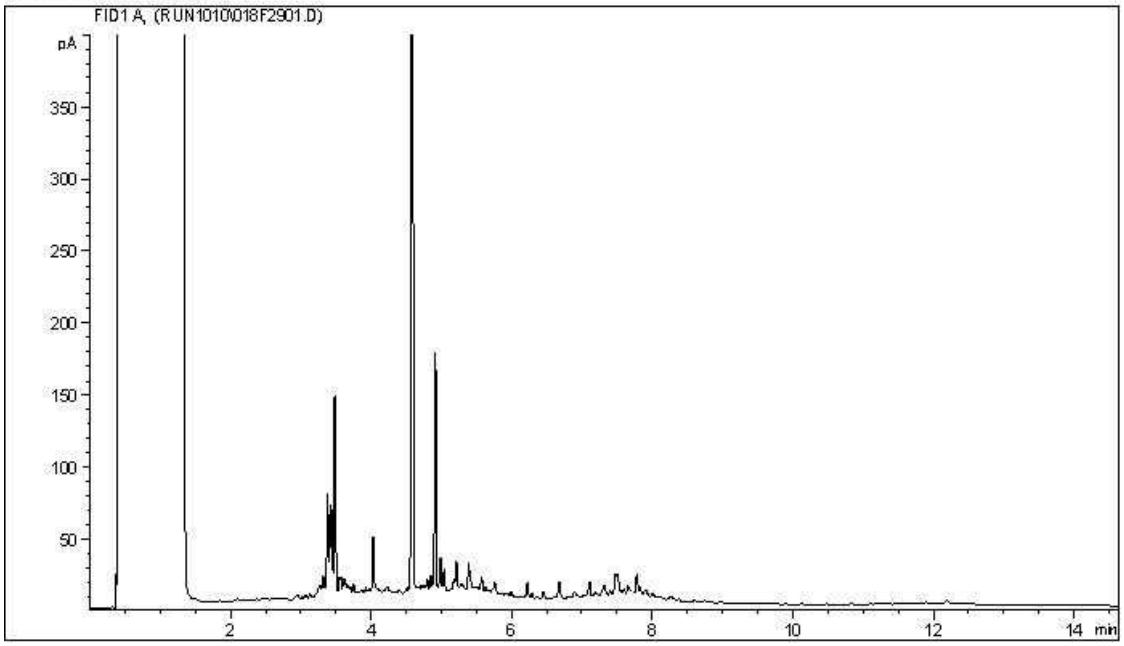
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

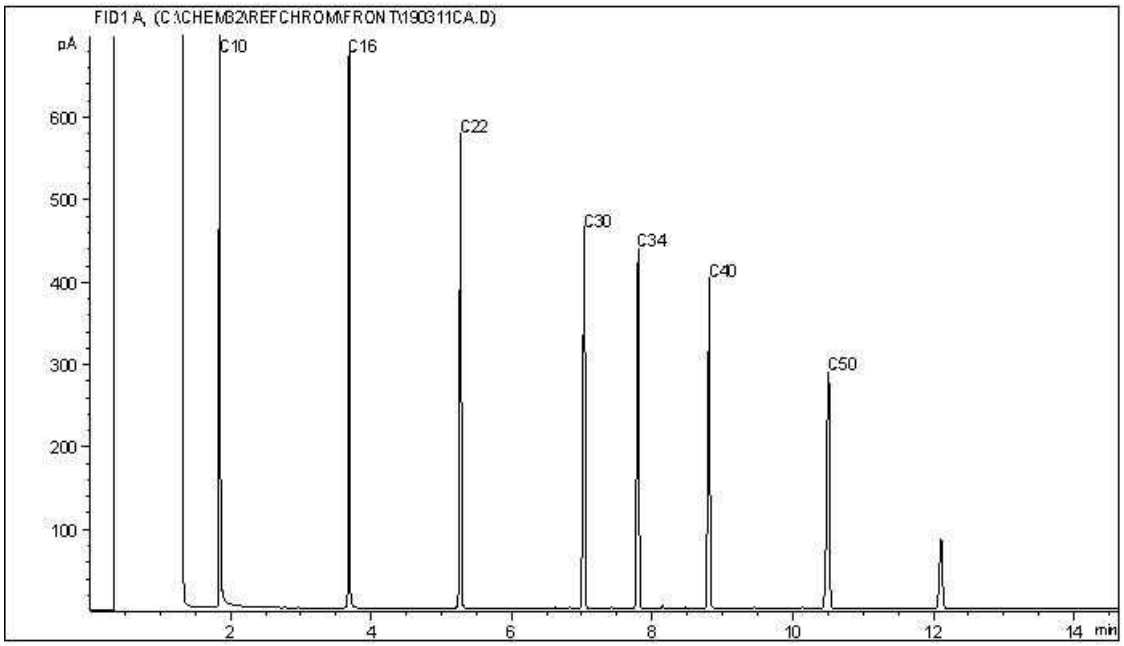
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

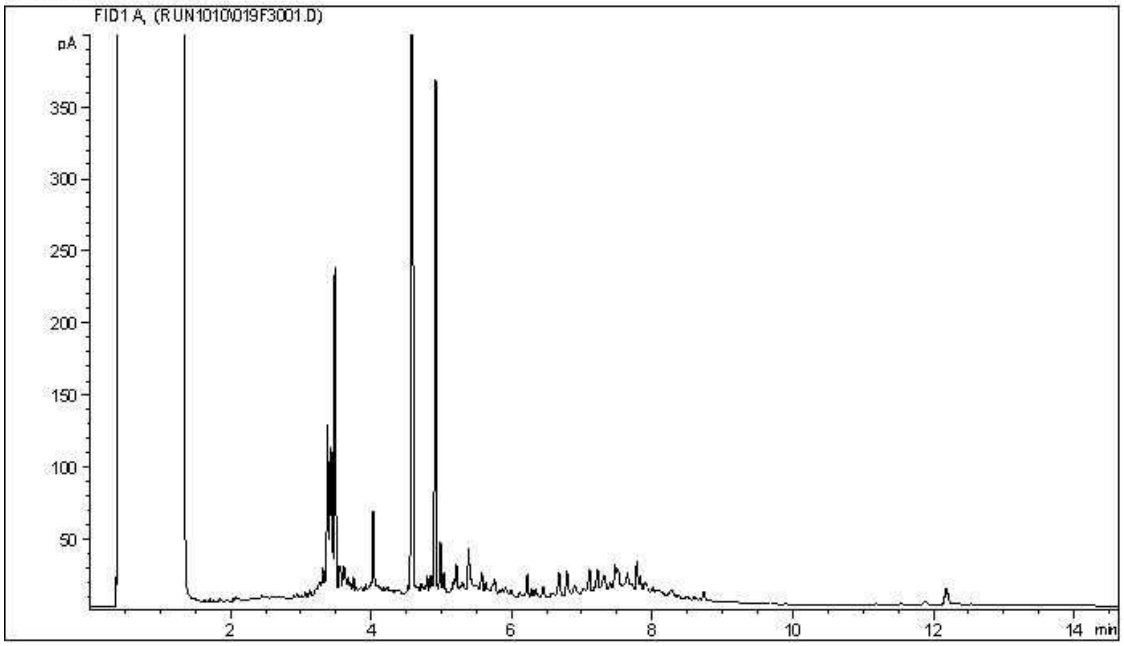
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ8994

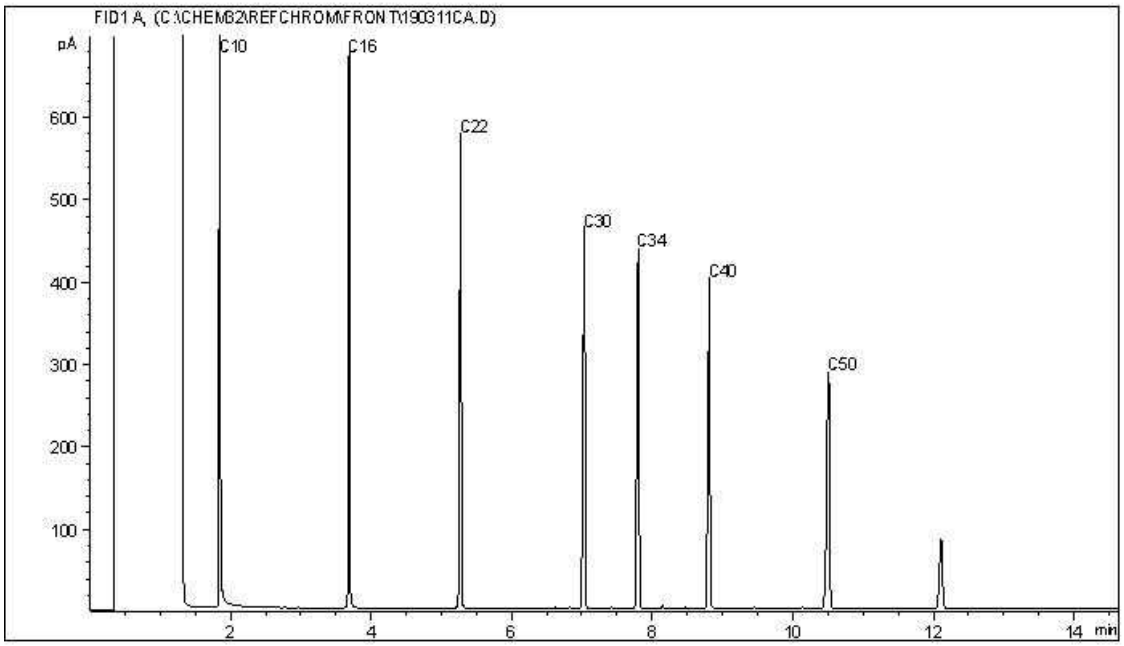
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-22

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

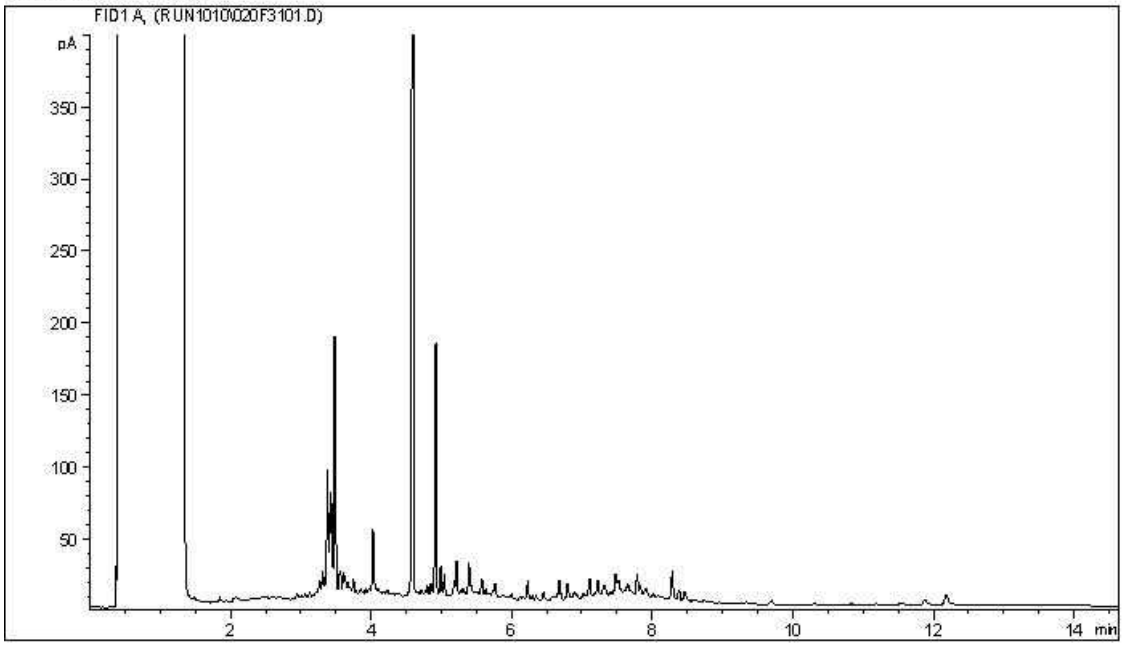
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ8995

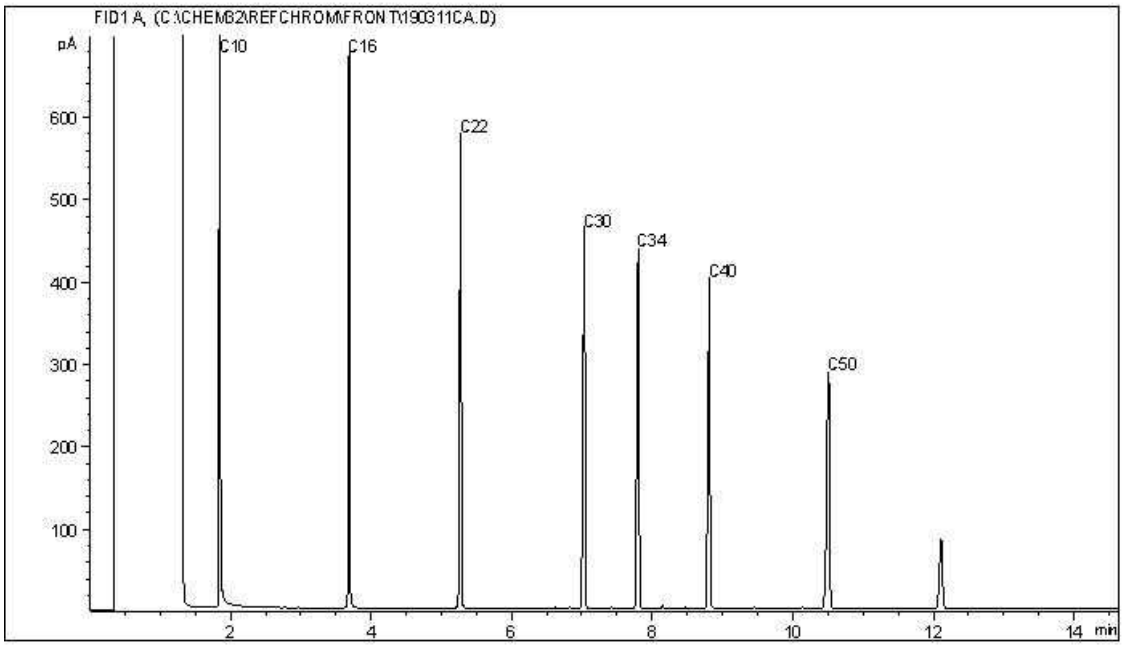
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-23

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

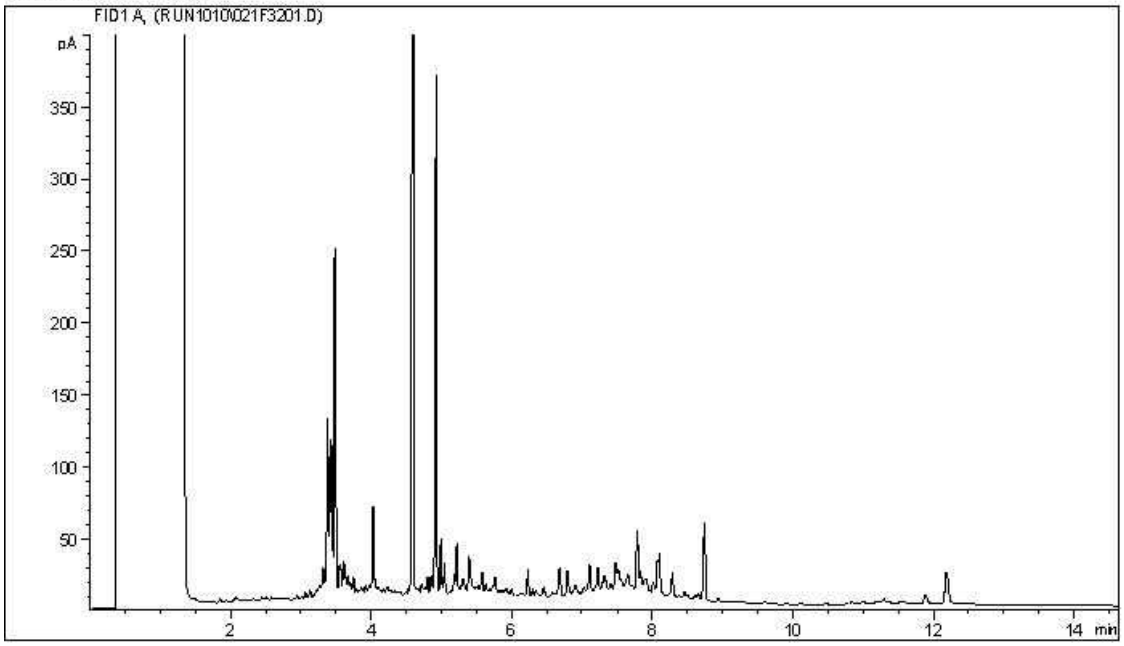
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ8996

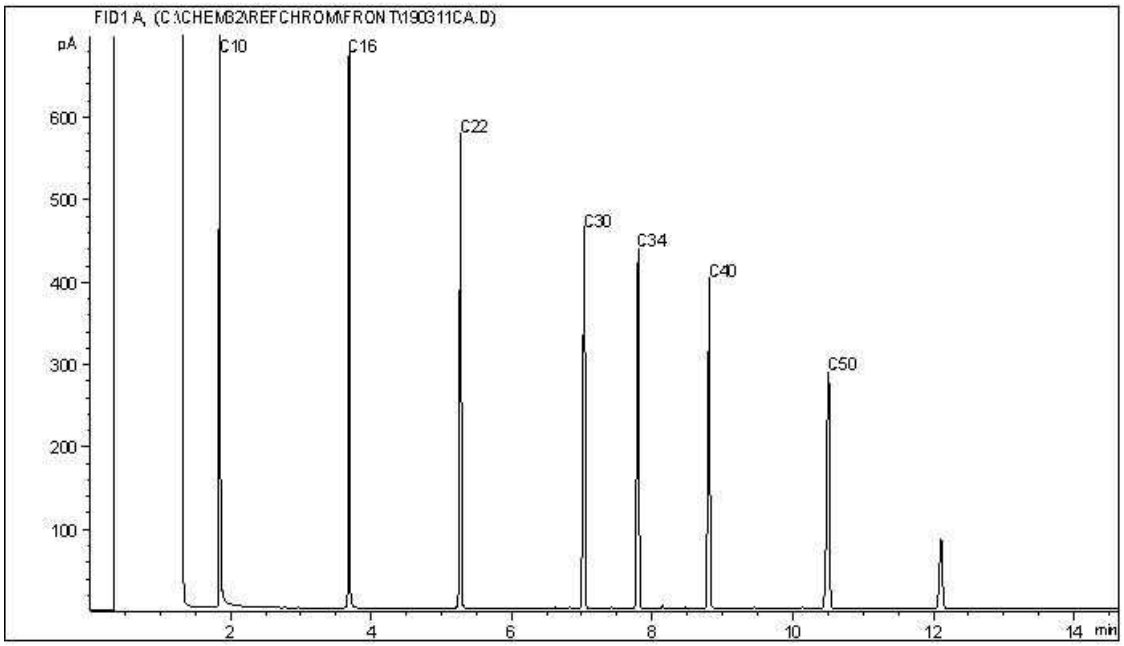
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-24

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

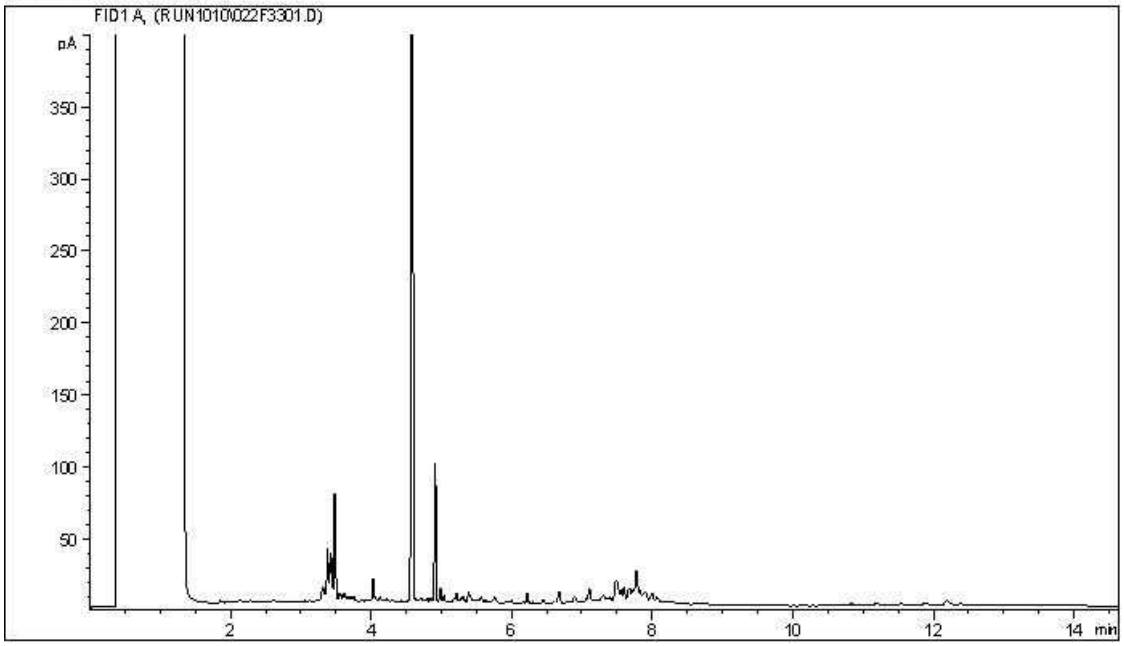
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ8997

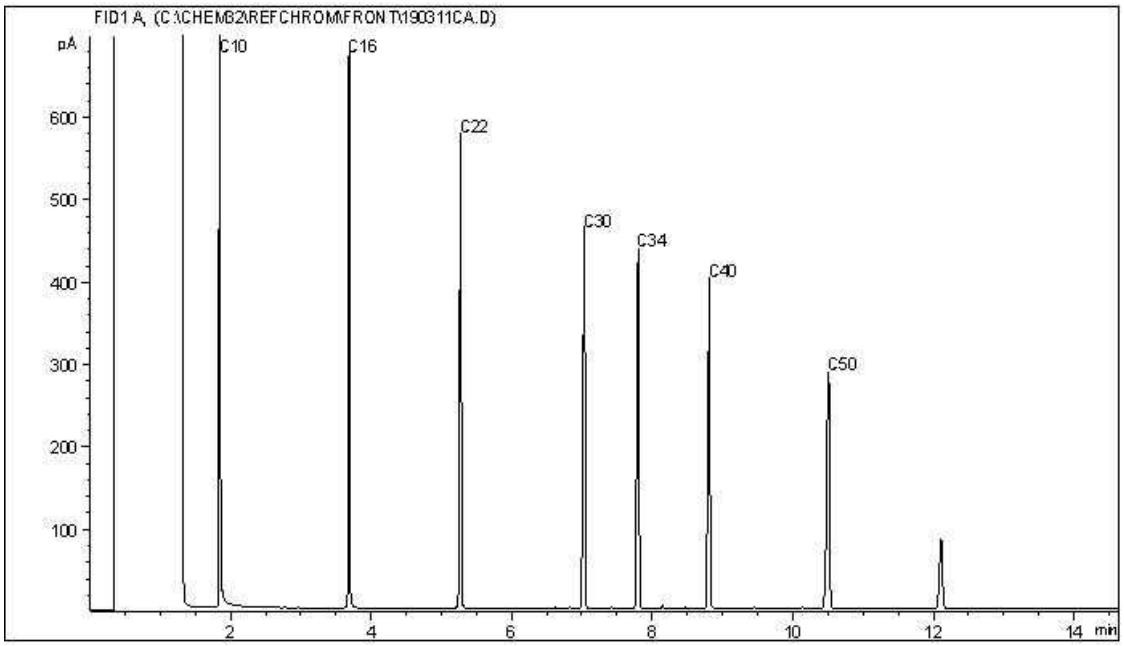
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-25

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

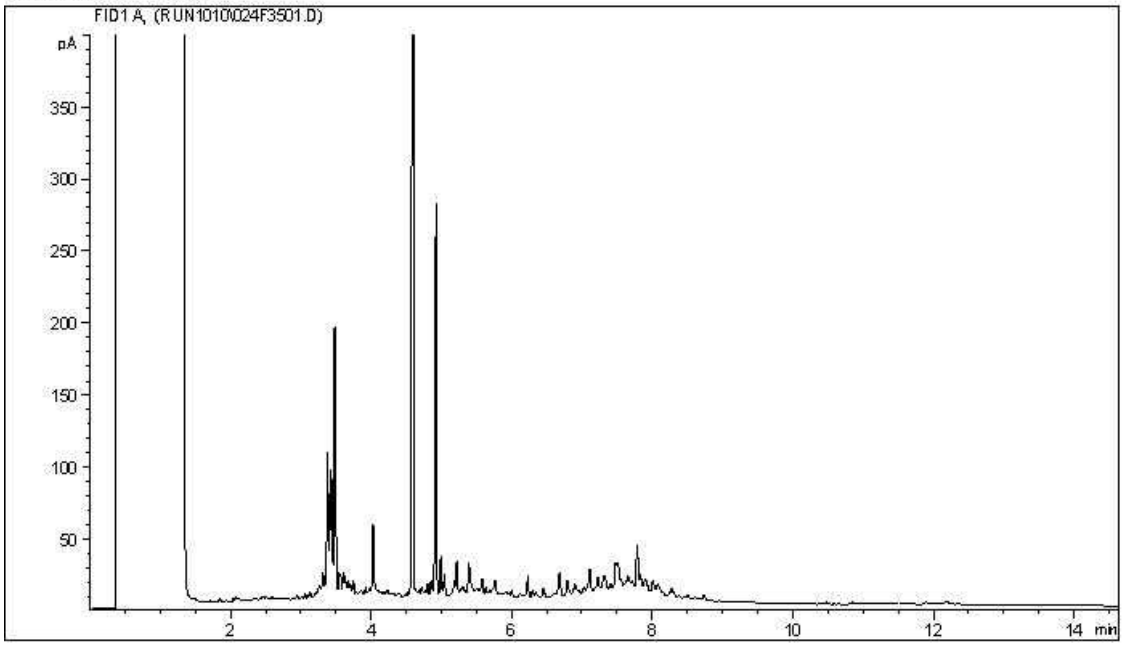
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ8998

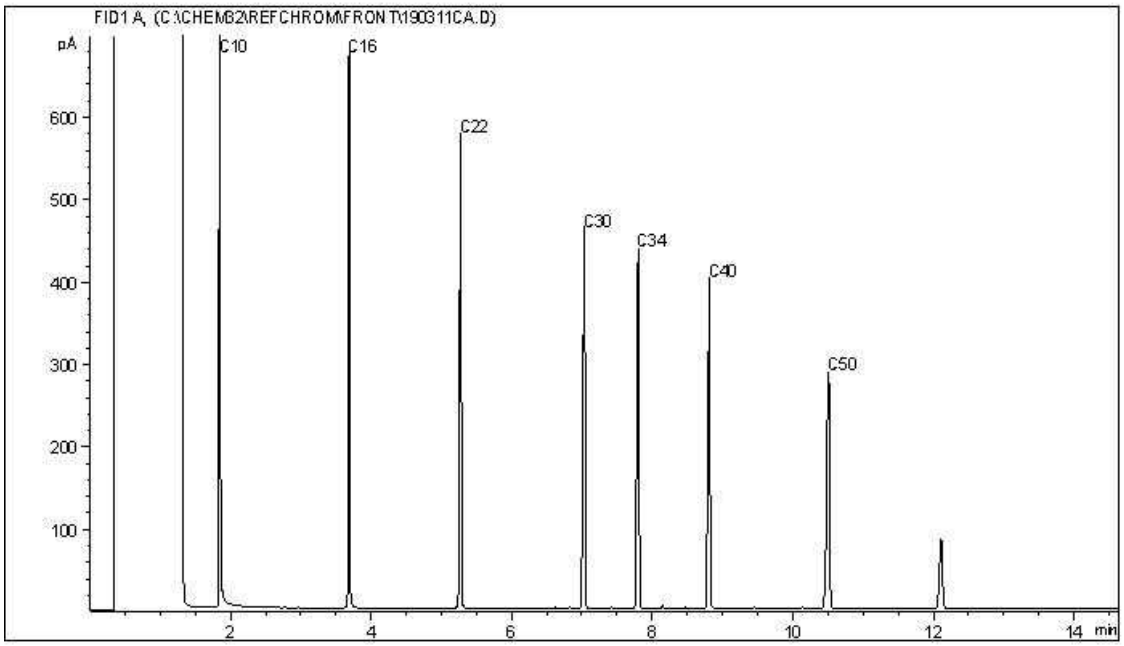
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-26

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



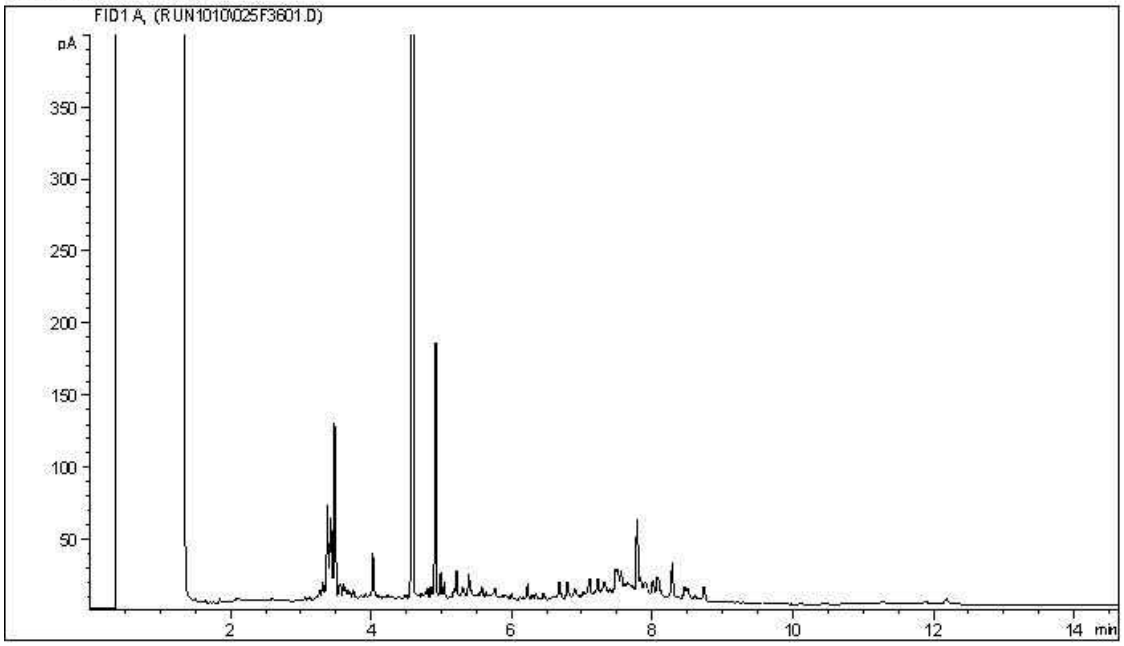
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

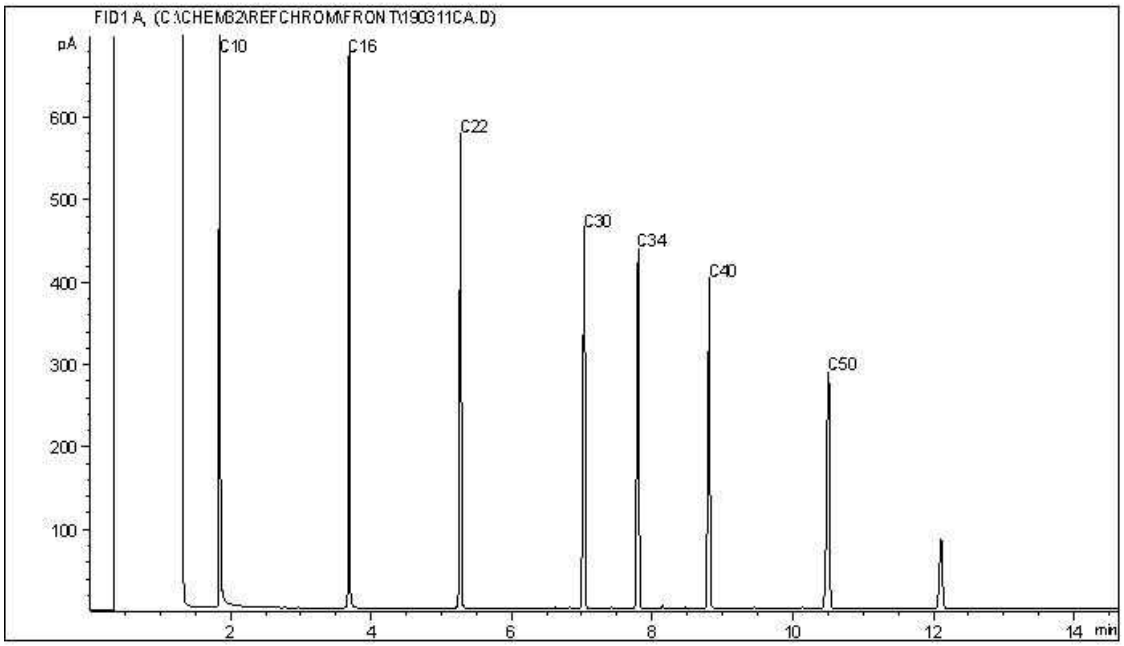
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

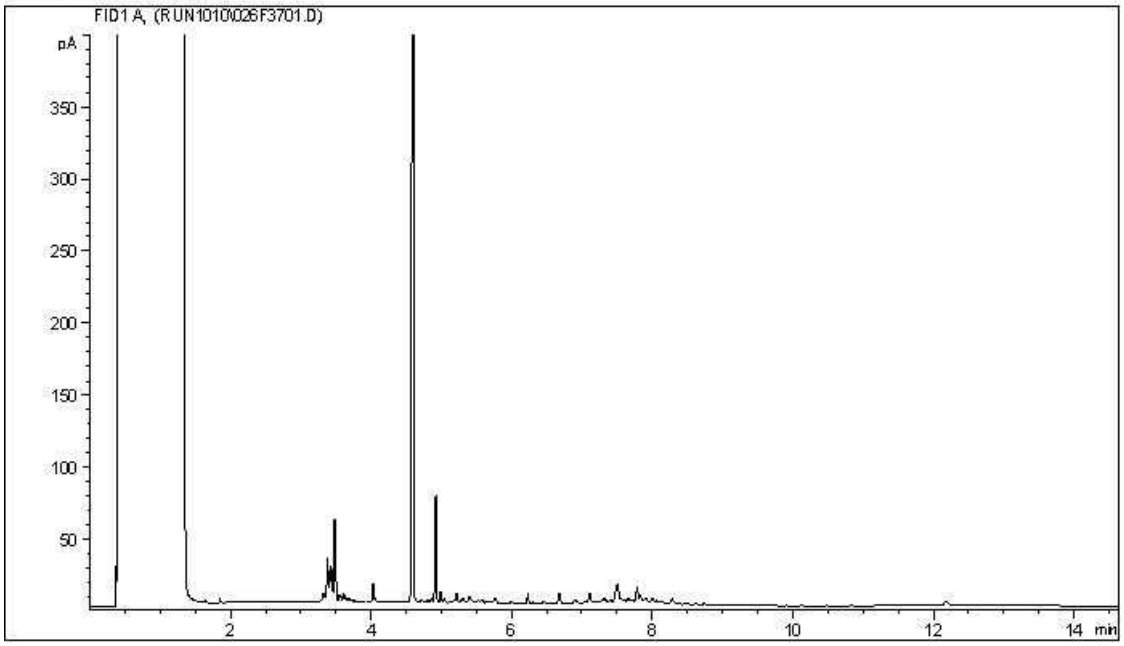
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ9000

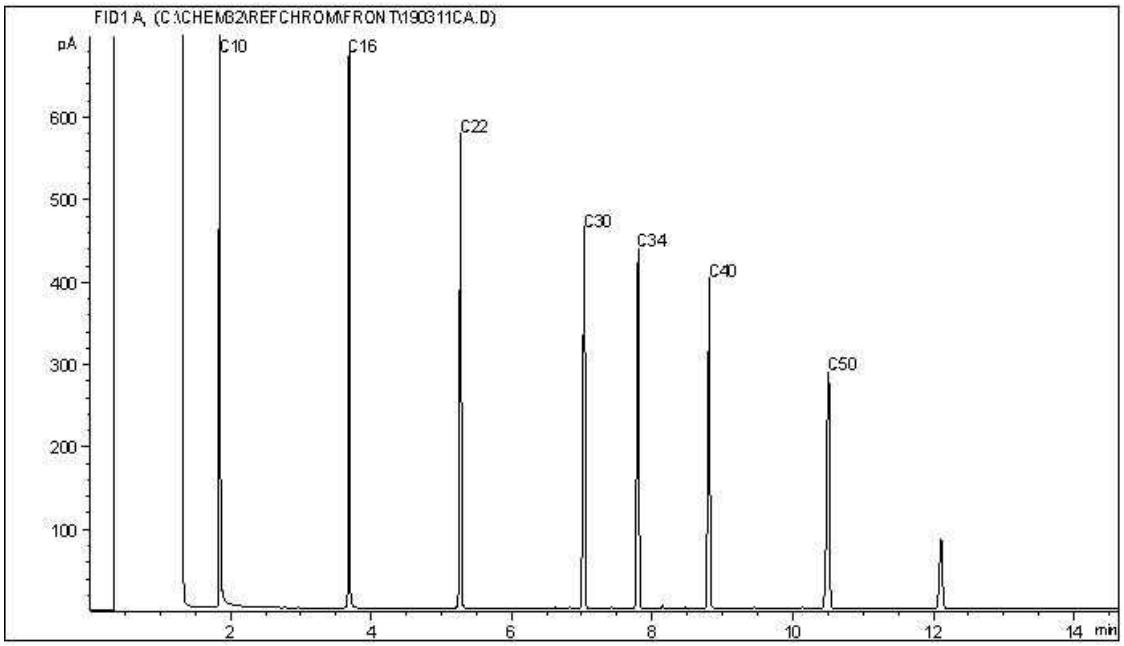
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-28

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



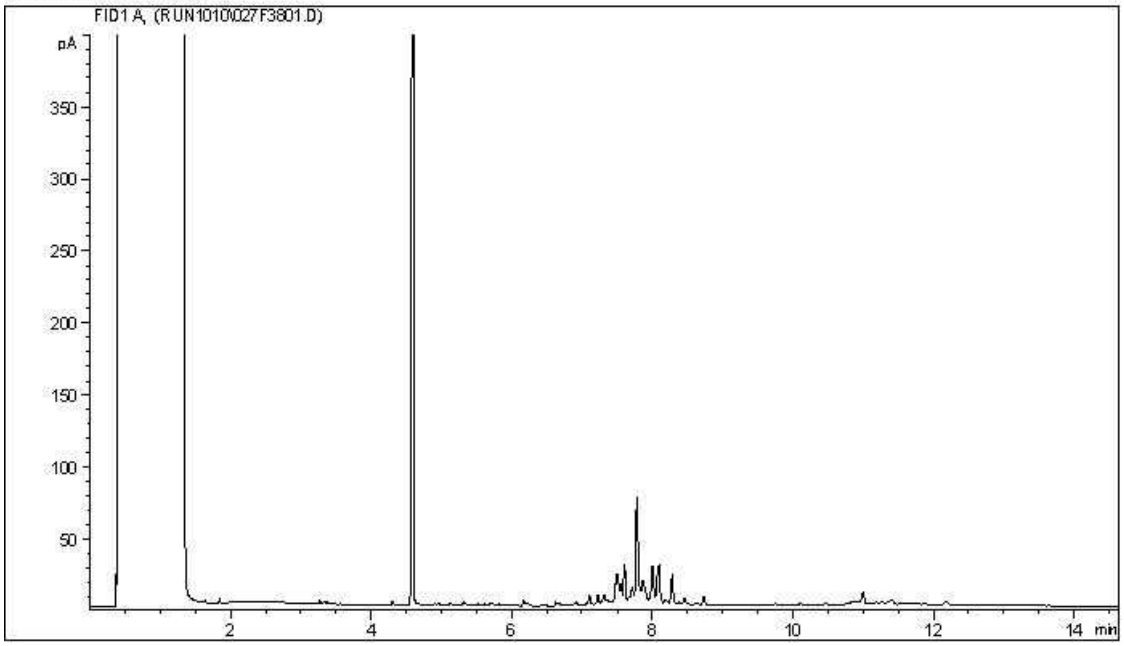
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

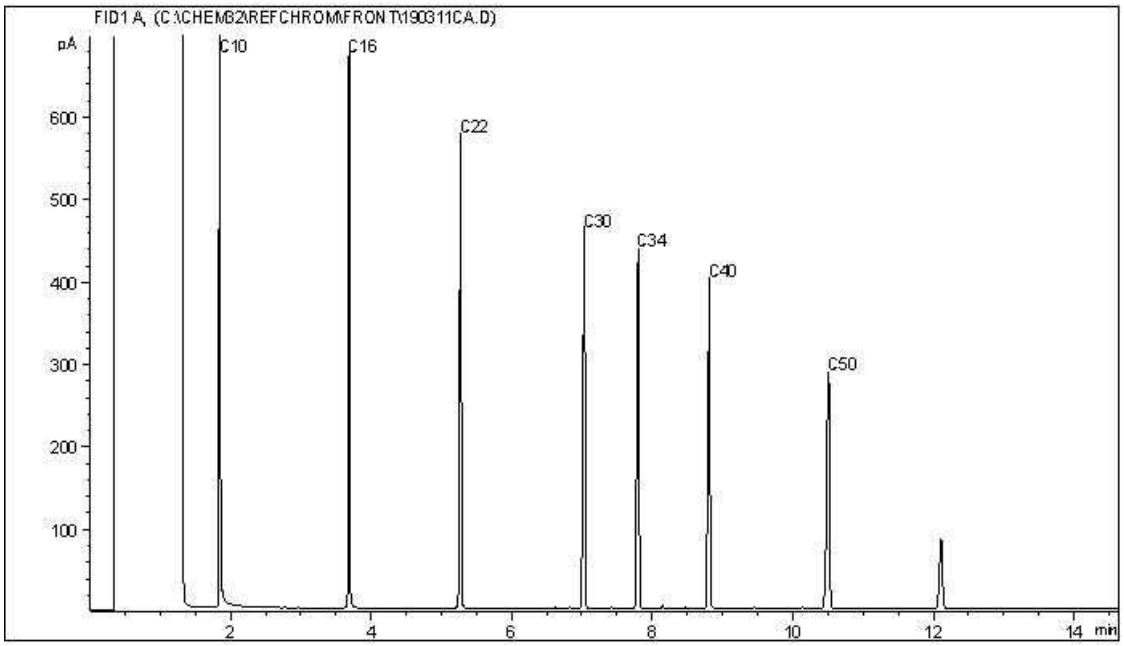
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

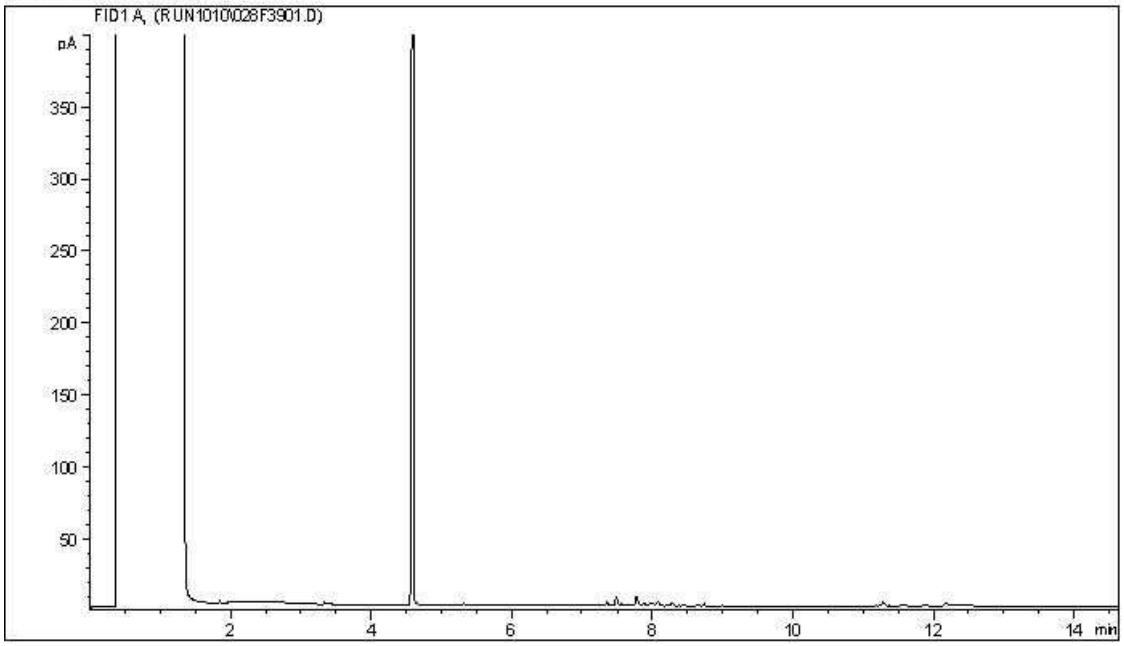
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ9002

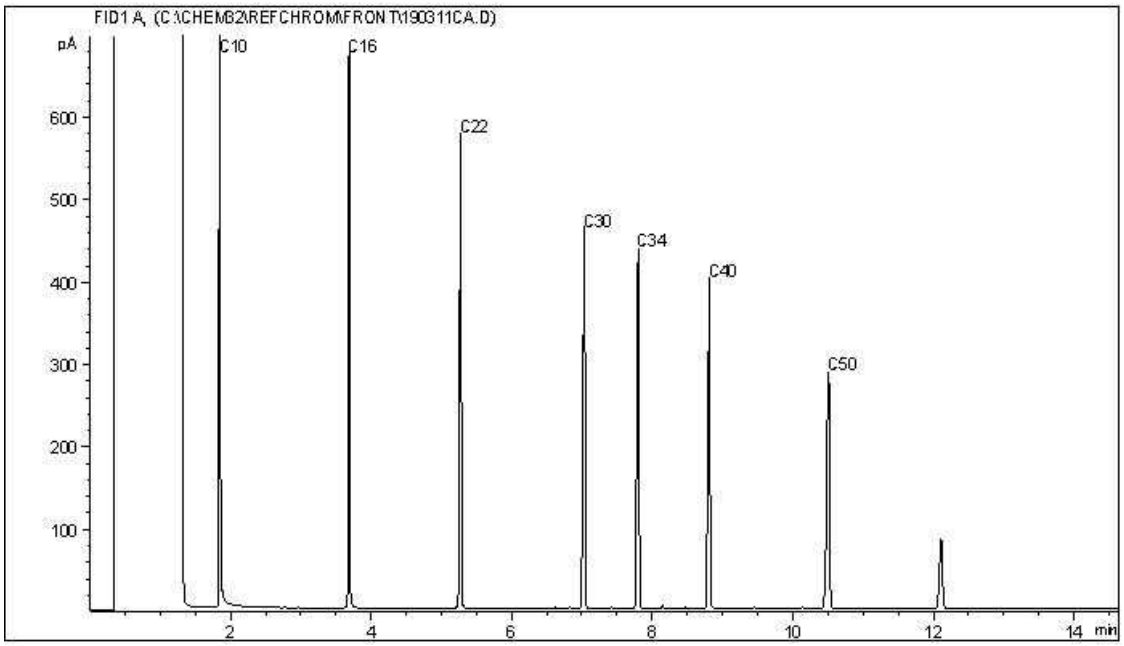
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-30

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



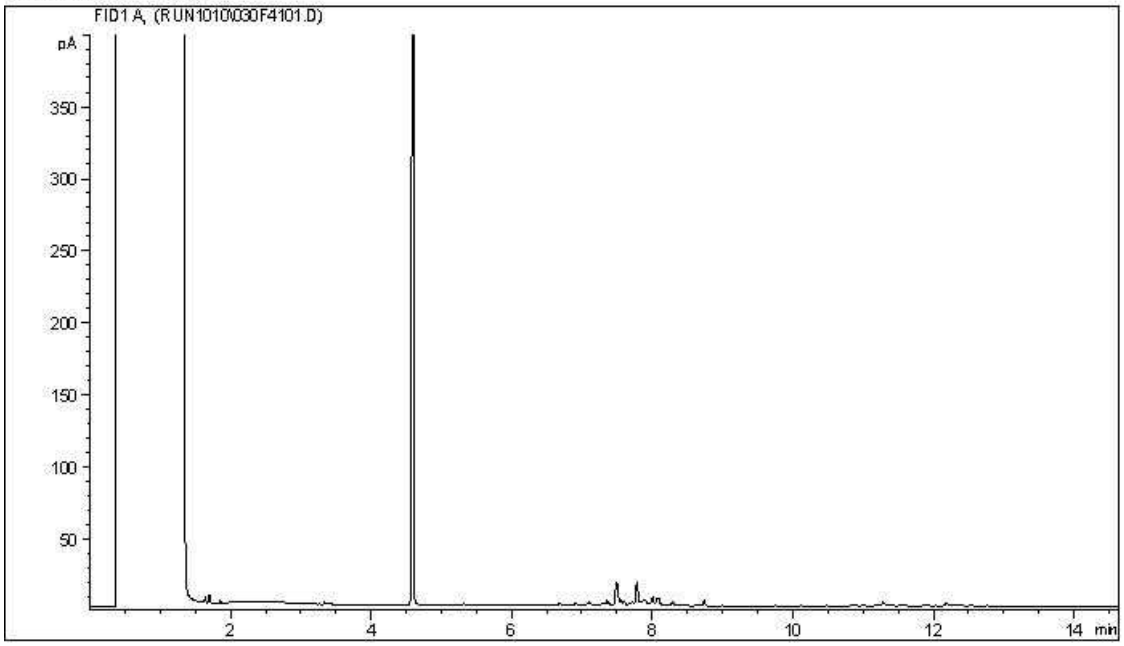
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

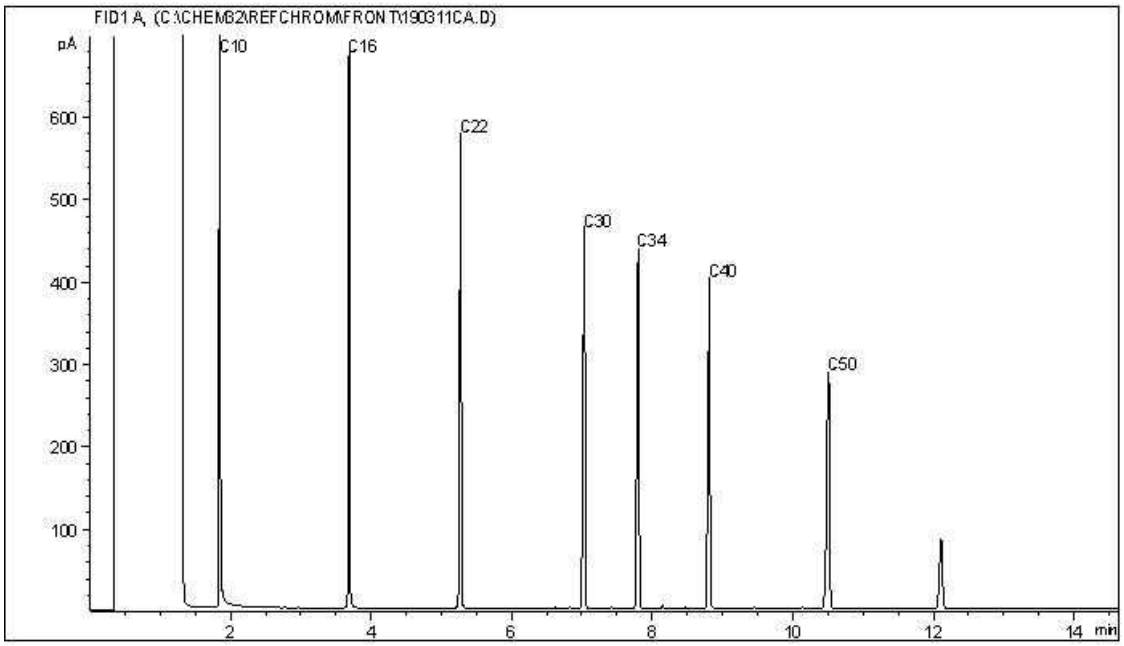
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



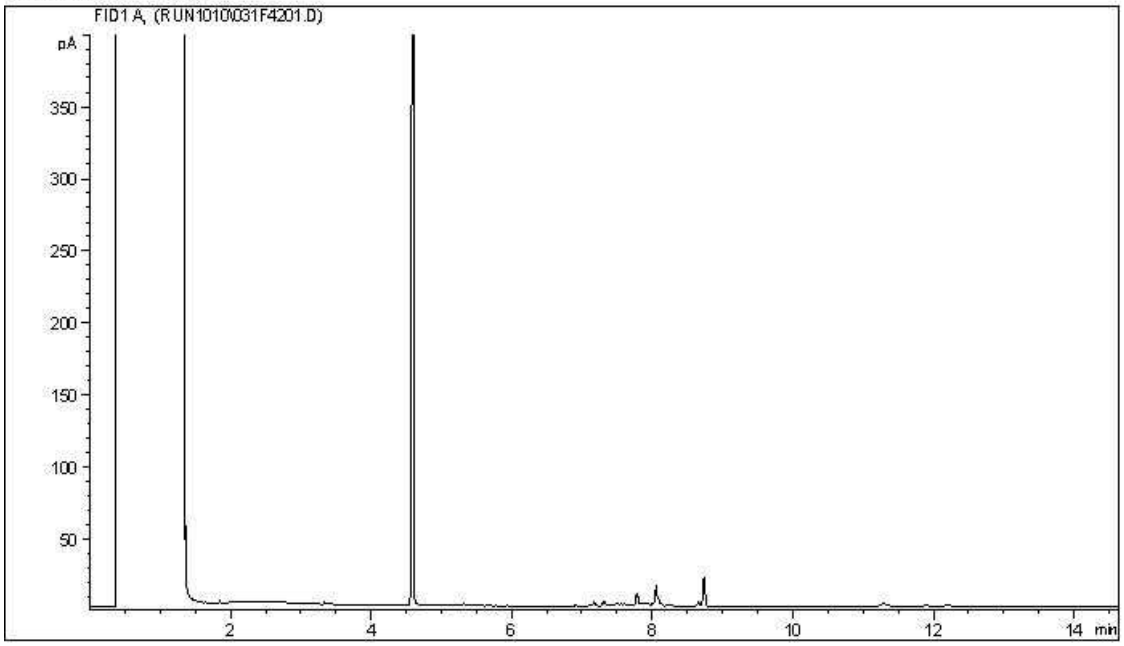
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

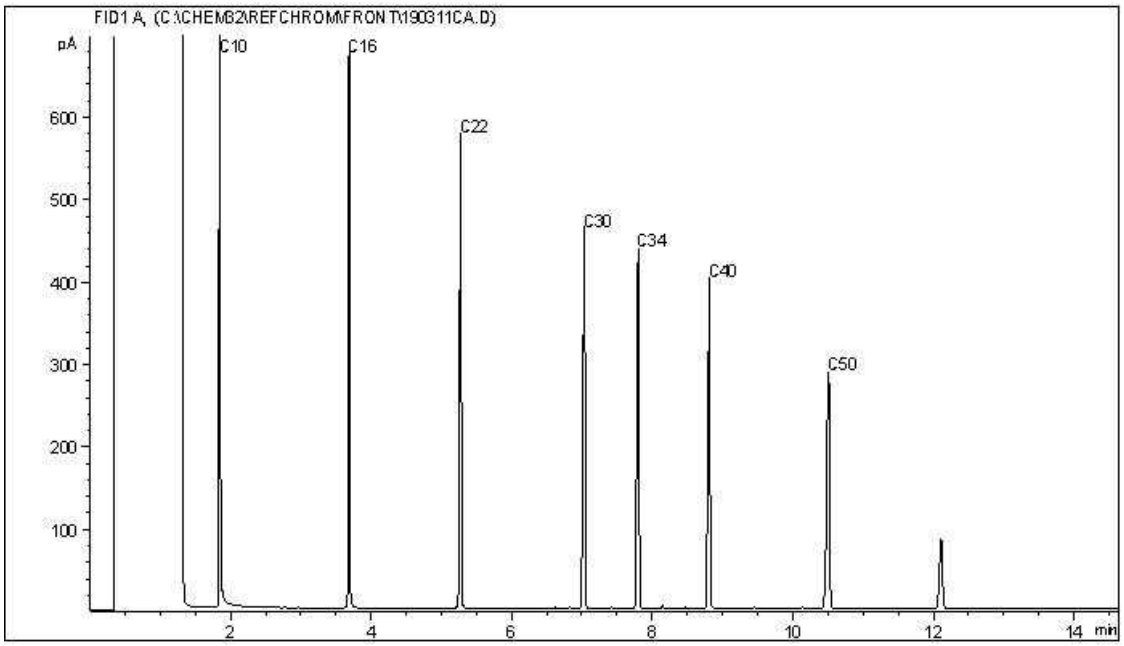
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

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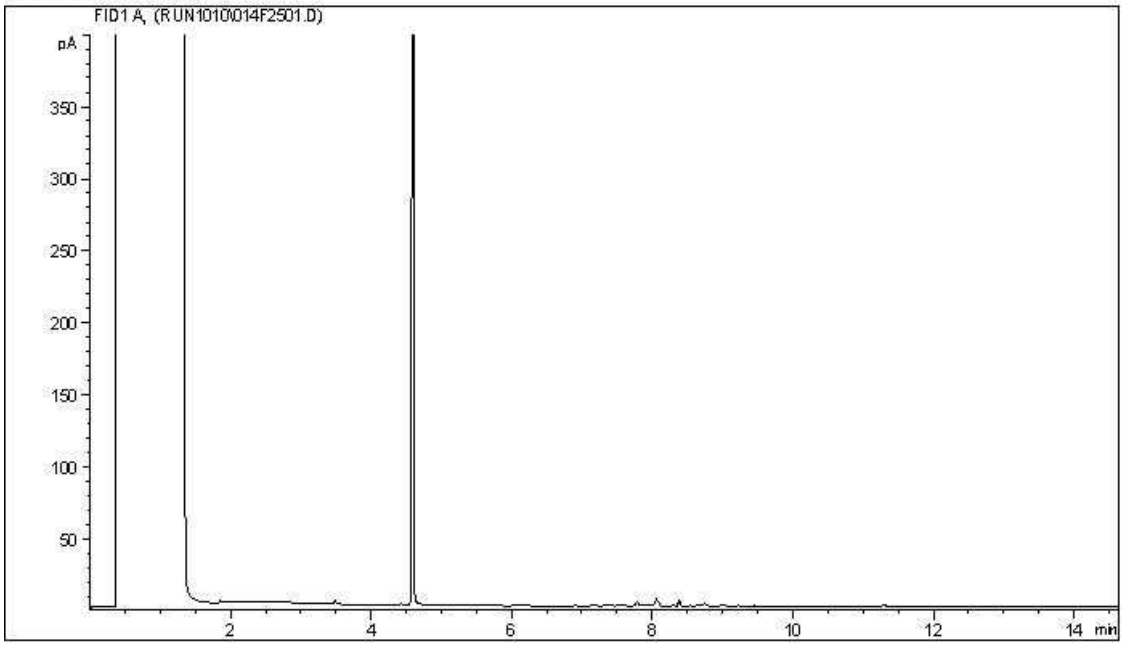
BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ9006

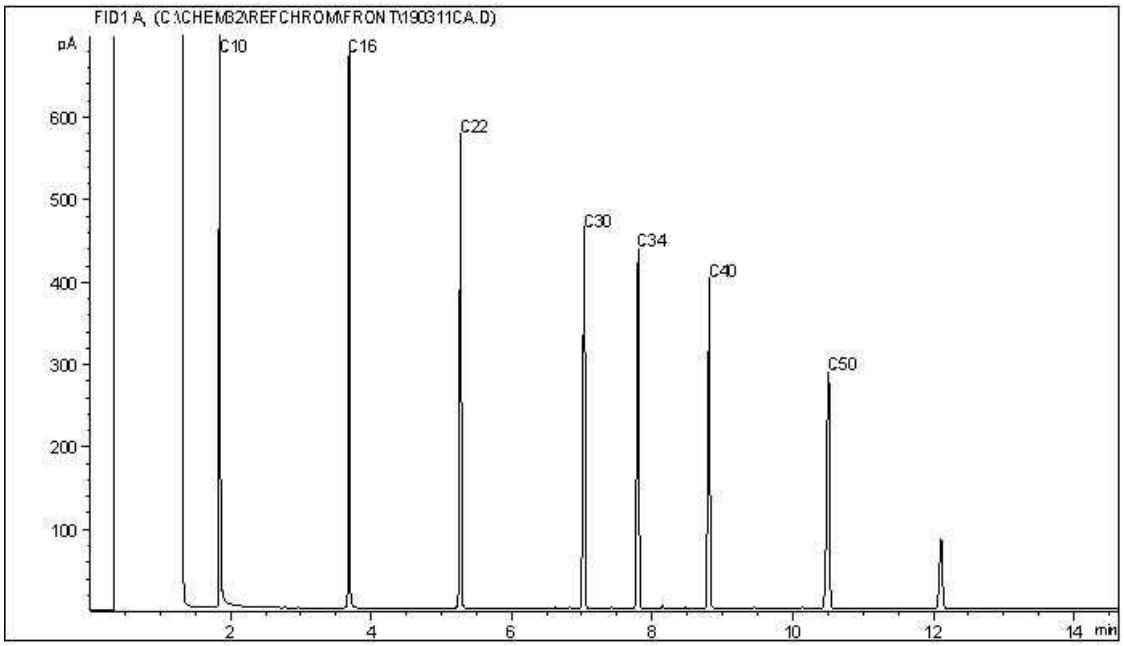
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-33

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

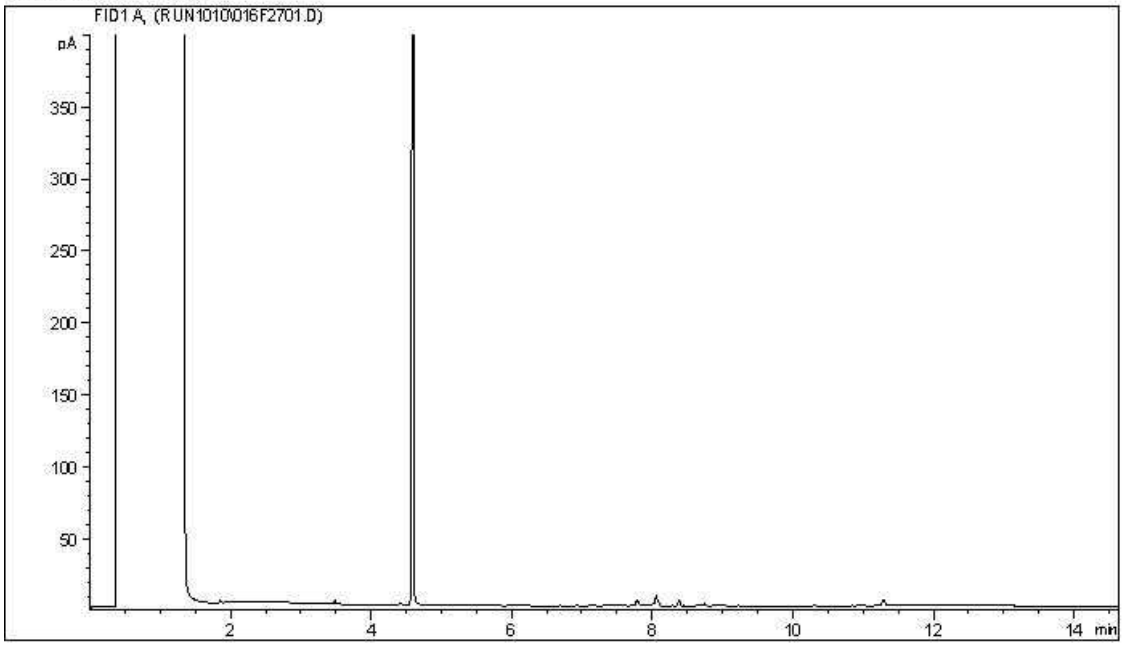
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: B986155
Report Date: 2019/10/29
BV Labs Sample: WQ9006 Lab-Dup

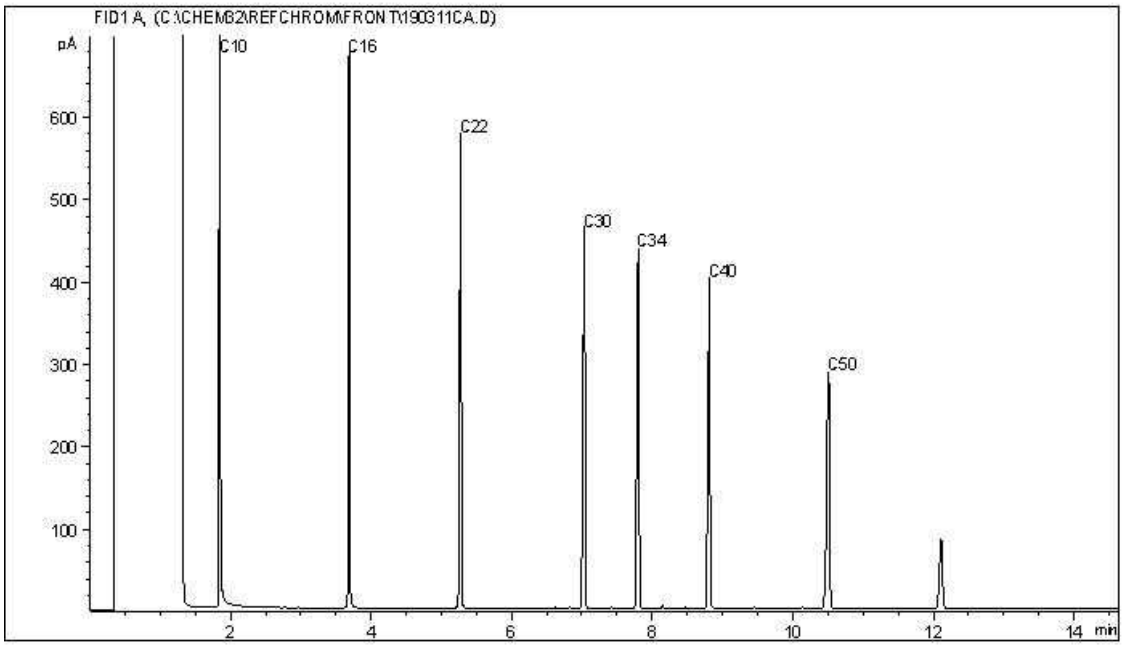
DILLON CONSULTING LTD.
Client Project #: 19-1615
Client ID: SS19-33

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

EMSL Canada Inc.

2756 Slough Street Mississauga, ON L4T 1G3
Phone/Fax: (289) 997-4602 / (289) 997-4607
http://www.EMSL.com / torontolab@emsl.com

EMSL Canada Order 551912585
Customer ID: 55DILL77
Customer PO: 19-1615
Project ID:

Attn: Rob Hochkievich
Dillon Consulting
1558 Willson Place
Winnipeg, MB R3T 0Y4

Phone: (204) 453-2301
Fax: (204) 452-4412
Collected: 10/ 3/2019
Received: 10/17/2019
Analyzed: 11/09/2019

Proj: 19-1615

Test Report: Asbestos Analysis of Bulk Materials for Manitoba Regulation 217/2006 via EPA600/R-93/116 Method

Client Sample ID: AS-01A-Floor Tile ***Lab Sample ID:*** **551912585-0001**
Sample Description: Vinyl Floor Tile and Mastic - Gray

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	10/24/2019	Gray	0.0%	99.4%	**0.63% Chrysotile**	TEM recommended

Client Sample ID: AS-01A-Mastic ***Lab Sample ID:*** **551912585-0001A**
Sample Description: Vinyl Floor Tile and Mastic - Gray

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	10/24/2019	Black	0.0%	100.0%	None Detected	

Client Sample ID: AS-01B-Floor Tile ***Lab Sample ID:*** **551912585-0002**
Sample Description: Vinyl Floor Tile and Mastic - Blue

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	11/09/2019	Blue	0.0%	98.8%	**1.2% Chrysotile**	

Client Sample ID: AS-01B-Mastic ***Lab Sample ID:*** **551912585-0002A**
Sample Description: Vinyl Floor Tile and Mastic - Blue

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	10/24/2019	Black	0.0%	96.0%	**4% Chrysotile**	

Client Sample ID: AS-01C-Floor Tile ***Lab Sample ID:*** **551912585-0003**
Sample Description: Vinyl Floor Tile and Mastic - Cream

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	11/09/2019	Beige	0.0%	99.3%	**0.70% Chrysotile**	TEM recommended

Client Sample ID: AS-01C-Mastic ***Lab Sample ID:*** **551912585-0003A**
Sample Description: Vinyl Floor Tile and Mastic - Cream

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	10/24/2019	Black	0.0%	98.0%	**2% Chrysotile**	

Client Sample ID: AS-01D-Floor Tile ***Lab Sample ID:*** **551912585-0004**
Sample Description: Vinyl Floor Tile and Mastic - Cream

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	11/09/2019	Beige	0.0%	98.9%	**1.1% Chrysotile**	

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EMSL Canada Order 551912585
Customer ID: 55DILL77
Customer PO: 19-1615
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Manitoba Regulation 217/2006 via EPA600/R-93/116 Method

Client Sample ID: AS-01D-Mastic ***Lab Sample ID:*** **551912585-0004A**

Sample Description: Vinyl Floor Tile and Mastic - Cream

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	10/24/2019	Black	0.0%	99.0%	**1% Chrysotile**	

Client Sample ID: AS-01E-Floor Tile ***Lab Sample ID:*** **551912585-0005**

Sample Description: Vinyl Floor Tile and Mastic - Gray

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	11/09/2019	Gray	0.0%	99.4%	**0.63% Chrysotile**	TEM recommended

Client Sample ID: AS-01E-Mastic ***Lab Sample ID:*** **551912585-0005A**

Sample Description: Vinyl Floor Tile and Mastic - Gray

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	10/24/2019	Black	0.0%	100.0%	None Detected	

Client Sample ID: AS-02A ***Lab Sample ID:*** **551912585-0006**

Sample Description: Transite Board

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	10/24/2019	Gray	0.0%	85.0%	**15% Chrysotile**	

Client Sample ID: AS-02B ***Lab Sample ID:*** **551912585-0007**

Sample Description: Transite Board

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	10/24/2019				Positive Stop (Not Analyzed)	

Client Sample ID: AS-02C ***Lab Sample ID:*** **551912585-0008**

Sample Description: Transite Board

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	10/24/2019				Positive Stop (Not Analyzed)	

Client Sample ID: AS-03A ***Lab Sample ID:*** **551912585-0009**

Sample Description: Asphalt Shingles - Green

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	10/24/2019	Black/Green	0.0%	100%	None Detected	

Client Sample ID: AS-03B ***Lab Sample ID:*** **551912585-0010**

Sample Description: Asphalt Shingles - Red

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	10/24/2019	Red/Black	0.0%	100%	None Detected	

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EMSL Canada Order 551912585
Customer ID: 55DILL77
Customer PO: 19-1615
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Manitoba Regulation 217/2006 via EPA600/R-93/116 Method

Client Sample ID: AS-03C ***Lab Sample ID:*** **551912585-0011**

Sample Description: Asphalt Shingles - Green

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	10/24/2019	Black	0.0%	100%	None Detected	

Analyst(s):

Caroline Allen	PLM Grav. Reduction (4)
Ioana Taina	PLM (2) PLM Grav. Reduction (1)
Tiffany Pilon	PLM (4) PLM Grav. Reduction (3)

Reviewed and approved by:

Matthew Davis or other approved signatory
or Other Approved Signatory

None Detected = <0.1%. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. This report must not be used to claim product endorsement by NVLAP of any agency or the U.S. Government

Samples analyzed by EMSL Canada Inc. Mississauga, ON NVLAP Lab Code 200877-0

Initial report from: 10/24/201915:27:29

References

Canadian Council of Ministers of the Environment (CCME). (2008). Canadian Environmental Quality Guidelines.

Canadian Council of Ministers of the Environment (CCME). (2008). Canada Wide Standards for Petroleum Hydrocarbons in Soil.

Canadian Standards Associated (CSA). (2016). Phase I Environmental Site Assessment Z768-01 (reaffirmed 2016).

Canadian Standards Association (CSA). (2000). Phase II Environmental Site Assessment Z769-00 (re-affirmed 2012).

Environmental Risk Information Services. (2019). Database Report.

Environmental Risk Information Services. (2019). Physical Setting Report.

Manitoba Workplace Safety and Health Regulation. M.R., 217/2006

Natural Resources Canada. (2019). The Atlas of Canada - Toporama.

Public Services and Procurement Canada. (2017). Asbestos Management Standard, updated October 2018.

Radon Environmental Management Corporation. (2011). Radon Potential Map of Canada. Retrieved 10 27, 2017, from Radon Environmental Management Corporation: http://radoncorp.com/mapping/canada-map.php

SAFE Work Manitoba (May 2017). Guide for Asbestos Management.

The Weather Network. (2019). Churchill Climate.

APPENDIX B

REMEDIAL ACTION PLAN, FORMER SAYISI DENE VILLAGE SITE, PART PARCEL A PLAN #39799 PLTO, CHURCHILL, MANITOBA, DILLON CONSULTING LIMITED AND OUTCOME CONSULTANTS, 2021

PUBLIC SERVICES AND PROCUREMENT CANADA

Remedial Action Plan

Former Sayisi Dene Village – Churchill, Manitoba

June 2021 – 21-1064

June 2, 2021

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Attention: Marie McGregor
Senior Environmental Specialist

Remedial Action Plan – Site Remediation Former Sayisi Dene Village Site Part A Plan #39799 PLTO Churchill, Manitoba
PSPC Project #: R.089501.002

Dillon Consulting Limited and Outcome Consultants in joint venture (Dillon-Outcome) are pleased to provide Public Services and Procurement Canada (PSPC) with the attached Remedial Action Plan for the Former Sayisi Dene Village.

If you have any questions or comments regarding this submission, please contact Vanessa Krahn at (204) 453-2301, ext. 4023 or by email at vkrahn@dillon.ca.

Sincerely,

DILLON CONSULTING LIMITED
IN JOINT VENTURE WITH OUTCOME CONSULTANTS
DILLON-OUTCOME

Vanessa Krahn, M.Sc., P.Eng.
Project Manager

NCB:bg

Our file: 21-1064

Table of Contents

Appendices

1.0 Introduction

Dillon Consulting Limited and Outcome Consultants in a joint venture (Dillon-Outcome) was retained by Public Services and Procurement Canada (PSPC) under Dillon-Outcome's environmental standing offer contract with PSPC to provide engineering design services for implementation of soil remediation and asbestos abatement activities at the former Sayisi Dene Village, Churchill, Manitoba (the site).

This Remedial Action Plan (RAP) has been prepared to provide the basis for design and preparation of tender documents and verify that the proposed remedial approach is viable, cost-effective and will achieve the remediation objectives. The RAP has been prepared based on the review of pertinent historical documentation.

The RAP has been organized as follows:

	Section	Contents
1	Introduction	Introduction, Background, Remedial Objective, Proposed Remedial Approach
2	Environmental Condition	Contaminants of Concern, Extent of Contamination
3	Remedial Design Considerations	Discussion of Remedial Design Processes and Measures to Alleviate Construction-Related Risks
4	Schedule	Preliminary Construction Schedule
5	Remedial Action Verification and Monitoring	Remedial Action Verification and Monitoring Plan Outline
6	Summary	Provides a summary and opines on the viability and appropriateness of the remedial approach with respect to meeting the remedial objective

1.1 Background

The former Sayisi Dene Village (herein known as the "subject site" or the "site") is located approximately 4.5 kilometers (km) southeast of Churchill, Manitoba. The site was previously developed in 1950 for residence buildings with approximately 60 residential units. The Village was in existence until 1973 when occupants left and the buildings were torn down, removed, transferred to Goose Creek or burned. The site currently consists of a lot covered by grass and gravel/fill material, as well as various bedrock outcrops that have been overgrown with trees and shrubs.

A Phase I/II Environmental Site Assessment (ESA) (Dillon-Outcome, 2019) was conducted to identify and confirm the nature of areas of potential environmental concern (APECs) (i.e., potential contaminant sources) and associated chemicals of potential concern (COPC). The study identified 57 housing units in varying condition. The remains of the housing units consisted of concrete footings and foundations with several fiberglass tanks (or remnants of fiberglass tanks) thought to hold potable water. Miscellaneous

debris such as glass, cans, wood, construction and metal debris were encountered throughout the site. The subject property currently has one (1) metal building existing that is used as a sweat lodge and a tent pole structure used for a dog mushing business; the remaining portion of the site is vacant. During the site visit, approximately 40 coal piles were observed throughout the site. Reportedly this coal was used to heat the residential homes that used to be present on the subject site.

Three (3) APECs and the associated COPCs were identified and intrusive activities were completed that included a limited surficial soil sampling program and asbestos-containing sampling program based on the findings of the records review and identification of APECs. The purpose of the program was to confirm the presence/absence of surficial soil contamination and asbestos fibres in miscellaneous building material debris within the identified APECs. The Phase I/II ESA report is attached as Appendix C.

The following is a summary of the findings for the APECs identified during the previous ESA activities.

1.1.1 APEC **1** – Coal Dust Piles

Coal dust was observed in piles throughout the site. Based on discussions with interviewees, coal was used to heat the residential homes until approximately 1973 when the occupants left. The coal material was historically placed in piles in front of the residential housing prior to use. During the ESA activities, evidence of approximately 40 coal pile remains were encountered with samples collected for analysis of benzene, toluene, ethylbenzene and xylenes (BTEX), petroleum hydrocarbons (PHC) F1 to F4, polycyclic aromatic hydrocarbons (PAH) and metals at 26 of the 40 locations (the other 14 coal dust piles were not sampled). Analytical results indicated that soil samples collected in 25 of the 26 locations exhibited concentrations that exceeded the applicable criteria for at least one (1) parameter of BTEX, PHC F1-F4, PAHs and metals. One (1) location (i.e., SS19-4) did not exhibit concentrations greater than the applicable criteria; selenium was not detected but the reportable detection limit (RDL) was elevated above the applicable criteria.

It is assumed that the 40 coal piles observed (including the fourteen (14) coal piles not sampled) have concentrations greater than the applicable criteria, which represent approximately 50 m^3 of contaminated material.

1.1.2 APEC **2** – Pail Dump Area

During the ESA field activities, a pail dump area was encountered in the northeastern portion of the site. One (1) soil sample (SS19-29) was collected for analysis of BTEX, PHC F1-F4, VOCs and metals. PHC F1 and PHC F2 were detected at concentrations greater than the applicable criteria. Toluene and trichloroethene were not detected, noting that their RDL was elevated above the applicable criteria for this sample.

1.1.3 APEC 3 – Asbestos-Containing Building Materials

During the ESA field activities, miscellaneous building debris was encountered including suspect asbestos-containing materials (ACMs). Sixteen (16) samples of non-friable building materials were collected for analysis to assess the presence of asbestos. The laboratory analysis indicated that eight (8) of the samples were ACMs (greater than 1.0% asbestos) and three (3) samples had trace asbestos. The ACMs consisted of debris from vinyl floor tiles, mastic associated with the vinyl floor tiles and "Transite" cement board. Since the Manitoba regulations indicate an ACM as any non-friable material that contains 1.0% or more asbestos, the trace asbestos present in the non-friable building material is considered a minor component of the material and, thus, not considered a regulated asbestos-containing material.

1.1.4 Miscellaneous Debris

Miscellaneous debris was encountered throughout the site including broken glass, cans, metal, miscellaneous construction debris, ovens and bed frames. It is estimated that there is approximately fifteen (15) tonnes of the miscellaneous debris to be removed. The description of the miscellaneous debris encountered throughout the site and approximate GPS points is included in Table 1 as part of Appendix C (Phase I/II ESA Report).

1.2 Remedial Objectives

The overall remedial objective is to alleviate the environmental liability at the site via the removal and proper disposal of contaminated soil in APEC 1 (i.e., BTEX, PHC, PAH and metals) and APEC 2 (i.e., PHC); APEC 3 (i.e., ACM); and miscellaneous debris.

The site contains cultural significance to the Sayisi Dene community. The purpose of the remedial activities is to remove identified impacts and contamination located at the site to residential guidelines prior to land reparation to the Sayisi Dene community. This Remedial Action Plan has been developed and remediation will be conducted to respect, preserve and alleviate the impact on the cultural significance of the site to the Sayisi Dene community. Building foundations and site access are to remain and, as part of the remedial objectives, areas not requiring remediation will be protected and the established work area will be limited to what is needed to conduct the work.

The applicable remediation criteria for soil are the Canadian Council of Ministers of the Environment (CCME) Canadian Soil Quality Guidelines for BTEX, PAH and metals; and Canadian-Wide Standards for Petroleum Hydrocarbons (CCME, 2008). Coarse-grained soil conditions are assumed. Given the low lying and marshy areas surrounding the site, the aquatic life groundwater check is applicable. Applicable land use is considered residential/parkland due to the site being maintained as a heritage cultural resource.

The applicable abatement criteria for ACM is PSPC Asbestos Management Standard (updated June 2019) which references local jurisdiction regulations. Specifically, Manitoba Workplace Safety and Health

Regulation, M.R. 217/2006 (Parts 2, 6, 33, 35, 36 and 37); and Guide for Asbestos Management, SAFE Work Manitoba (May 2017).

1.3 Proposed Remedial Approach

As recommended in the previous ESA report (Dillon, 2019), the preferred remedial approach for each APEC is as followed:

1.3.1 APEC 1 – Coal Dust Piles

Remediation of the 40 coal dust piles and associated contaminated soil will be conducted by excavation and off-site disposal at a licensed facility. Following excavation, confirmatory soil samples are to be collected along the limits and floor of the excavation and analyzed for the contaminants of concern (i.e. BTEX, PHC, PAH and metals) to document that remediation objectives have been met. The excavated area will be backfilled with clean material (i.e., granular materials) to surface to match existing surrounding site conditions. Restoration is to consider potential species at risk (SAR) and SAR habitat requirements which will be outlined in the Contractor's Environmental Protection Plan (see Section 4.2). Given the anticipated depth of excavation (i.e., <1 mbgs), groundwater is not anticipated to be encountered. However, the specifications have incorporated water management provisions that the contractor will need to follow should groundwater be encountered.

1.3.2 APEC 2 – Pail Dump Area

Remediation of soil impacts at the pail dump area will be conducted by collection and removal of suspect PHC-containing containers (i.e., pails and drums) followed by excavation and off-site disposal of contaminated soil. The waste and contaminated soil will be disposed of at a licensed facility. Following excavation, confirmatory soil samples are to be collected along the limits and floor of the excavation and analyzed for the contaminants of concern (i.e. PHC and chlorinated solvents) to document that remediation objectives have been met. The remedial procedure will be the same as APEC 1 with the exception of backfill materials. The excavated area is to be backfilled with clean native soils with a topsoil cover that supports the natural regrowth of native vegetation to match existing surrounding conditions. Restoration is to have regard to potential SAR and SAR habitat requirements which will be outlines in the Contractor's Environmental Protection Plan (see Section 4.2). The specifications will incorporate water management provisions that the contractor will need to follow should groundwater be encountered.

1.3.3 APEC 3 – Asbestos-Containing Building Material

Suspect ACM, specifically loose fragments of vinyl floor tiles and "Transite" cement board, will be collected and stored in asbestos waste bags, removed off-site and disposed of at a disposal facility licenced to accept ACM. Materials will be recovered following Type 1 Low Risk asbestos abatement procedures as outlined in the PSPC Asbestos Standard (updated June 1, 2019) and written processes

developed in accordance with the Canadian National Master Construction Specification (NMS), Section 02 82 00.01 (Asbestos Abatement—Minimum Precautions).

Type 1 Low Risk asbestos abatement procedures include the installation of site barriers and warning signs to restrict access to the asbestos work areas during the recovery of asbestos waste. The contractor must set-up a worker decontamination area with a wash task. Asbestos materials must be wet during abatement procedures to prevent the release of airborne asbestos fibres. Protective equipment and clothing is to be worn by workers while within the asbestos work area. At a minimum workers shall don an air purifying half-mask respirator with a P-100 particulate filter, disposable-type protective clothing that does not readily retain or permit the penetration of asbestos fibres, and protective gloves. Workers must decontaminate prior to leaving the asbestos work area, which may include the use of a vacuum equipped with a HEPA filter or by damp wiping.

The abatement procedure will include the collection of the loose fragments by traversing throughout the site and recovering materials by hand. It is expected that the majority of ACMs will be encountered within or on the ground adjacent to the footprints of the former residential units. Excavation will be limited to materials that are currently partially covered with soils or those materials exposed during other remediation activities at the site. Asbestos waste is to be removed and placed in sealable, impermeable container labelled as Asbestos-Containing Material and comprised of a 6-mil (0.15 mm) thick polyethylene bag with two layers or, a polyethylene bag positioned inside or outside a rigid sealed container (Asbestos Waste Receptacle). The estimated mass of asbestos waste is two (2) tonnes and the description of the asbestos-containing debris encountered throughout the site and approximate GPS points is included in Table 1 as part of Appendix C (Phase I/II ESA Report).

As part of abatement activities, miscellaneous debris encountered throughout the site, including, but not limited to, broken glass, cans, scrap metal, miscellaneous construction debris and household items, will be removed and disposed of at the local landfill for the purpose of general public safety and site aesthetics. It is estimated that there is approximately 15 tonnes of miscellaneous debris scattered throughout the project site primarily surrounding the building foundations. A detailed description of the debris encountered along with GPS points is included in Table 1 as part of Appendix C (Phase I/II ESA Report) as well as the site photographs.

2.0 Environmental Condition

The RAP has been developed to address the contamination identified at the site, which includes contaminated soil and ACM in three (3) APECs. The contaminants of concern (COCs) and their extent are presented below.

2.1 Contaminants of Concern

COCs in soil above the CCME criteria consists of BTEX, PHC, PAH and metals in the coal dust piles (APEC 1) and PHCs and chlorinated solvents in the pail dump area (APEC 2). It is noted that because laboratory results were inconclusive with respect to the presence of toluene and trichloroethene in the soil sample collected from the pail dump area (i.e., non-detect with an elevated RDL) and out of an abundance of caution, remediation of soils in the pail dump area will consider VOCs and address as part of the remedial design and verification sampling. Further, it is assumed that groundwater has not been impacted by historical site activities (i.e., coal dust piles or the pail dump area) and that the remedial design as part of this report and subsequent engineering specification package will be based on the remediation of soil within the vadose zone only.

Asbestos-containing building materials fragments (i.e., vinyl floor tiles and “Transite” cement board), have been identified at the site. Asbestos-containing building materials and how they will be addressed in the remedial design (i.e., removal of identified ACMs from the areas of the former residential units) and during implementation are described in Section 3.2.2 – Asbestos-Containing Materials Abatement.

2.2 Extent of Impacts

Based on previous ESA activities (Dillon, 2019), concentrations in soil exceeding the applicable CCME guidelines were detected at 25 of the 26 locations within APEC 1. One location (SS19-04) did not contain concentrations greater than the assessment criteria with the exception of the metal parameter selenium in which the detection limit was raised due to sample matrix interference. Concentrations in soil exceeding the applicable CCME guidelines were detected within APEC 2 (i.e., SS19-29). It is noted that delineation of soil impacts was not completed.

For the purpose of achieving the remedial objective, and as the basis for the remedial design and tendering (including the basis of the contractors’ bids), the horizontal extent of soil exceeding CCME criteria is defined by the horizontal extent of the observed source zones (i.e., the coal dust piles (CP1 – CP40) and the pail dump area) identified in the previous ESA activities (Dillon, 2019). Further, as impacts are anticipated to be shallow, the vertical extent of soil exceeding CCME criteria is defined as 0.3 mbgs, which is twice the depth of soil sample locations (0 – 0.15 mbgs) completed as part of previous ESA activities. This does not include two (2) locations (CP 11 and CP 39) that were observed to have mounded coal dust and anticipated soil impacts up to 1 mbgs.

For the purpose of estimating the extent and budget for remediation of the contaminated soil, the contaminated soil dimensions and volumes presented herein are assumed based on available and documented site information and our professional opinion. The extent of contamination (i.e., dimensions and volumes) may differ that what is discussed in this report. Estimates of contaminated soil volumes, calculated based on available information, is as follows:

- APEC 1 consists of approximately 40 coal dust piles. Each coal dust pile is assumed to have approximately 0.5 m^3 of impacted soil, with the exception of two (2) locations (i.e., CP 11 and CP 39) that have approximately 9 m^3 and 14 m^3 of impacted soil, respectively. The total volume of coal dust contaminated soil is approximately 50 m^3; and
- The total volume of contaminated soil in the pail dump area is approximately 20 m^3.

The inferred extent and location of soil impacts are presented in Figure 1 in Appendix A.

The extent of the ACMs was not defined during the previous ESA activities (Dillon-Outcome, 2019), however Dillon-Outcome has estimated a mass of approximately two (2) tonnes is present at the Site. The vinyl floor tiles and "Transite" cement board are building materials likely associated with the construction of the residential units at the site. Remaining loose fragments and debris are therefore suspected to be present on the ground within close proximity to the former building foundations.

3.0 Remedial Design

The following sections describe the proposed remedial design process and considerations. The remedial design will include specifications and contract drawings appropriate to meet the overall project objectives. In addition, a construction schedule, and cost estimate will be developed in conjunction with the final tender-ready documents. An estimated construction time line to complete remediation is presented in Section 5.0 and Appendix B.

3.1 Remedial Design Processes

Dillon-Outcome will prepare draft and final tender-ready documents for the remediation project. The design package will consist of plans/drawings, technical specifications, cost estimates and project schedule. The design package will be presented in the format and sizes as identified in the PSPC standards as outlined in the "Doing Business with PSPC" (January, 2018). Associated specification divisions and sections will be established in the kick-off meeting.

The draft tender-ready documents will include gathering information from the historical ESA documentation. Specifically, figures, plans and description of specific tasks will be developed for the contractor as required (but not limited to) soil excavation, asbestos-abatement and miscellaneous debris removal. Updates will include locations and quantities of COPCs as necessary for the successful completion of remediation at the site. Further, an opinion or probable cost, estimated schedule and unit price table will be developed from the work described herein.

The final tender-ready documents will include addressing PSPC comments on the draft tender-ready documents. Further, a separate dissertation table highlighting the rationale for how comments in the draft tender-ready documents were addressed will be submitted with the final Design and Specification tender package.

3.2 Remedial Design Consideration

3.2.1 Soil Excavation

For the purpose of the remediation cost and construction schedule, it is assumed that the soil excavation of the coal dust piles (APEC 1) and the pail dump area (APEC 2) will be completed by the same Contractor during the same site visit. Soil excavated during remediation will be removed from APECs and placed directly into a tandem truck via mini-excavator and disposed of off-site at an approved waste disposal facility. Based on available analytical data, COC concentrations do not exceed the criteria for acceptance of contaminated soil at waste disposal facilities as per Manitoba Conservation and Climates June 2016 bulletin. It is noted that soil may be accepted by a waste disposal ground as waste or as cover material, pending acceptance from the waste disposal ground. Impacted soil removed from the APECs will not be stored in stockpiles on-site. Further, soil removed from APECs are contaminated with

COCs above the applicable criteria and will not be permitted to be used as backfill for potential future land use on-site or within the community.

Absent delineation of horizontal and vertical extent of APECs, the horizontal boundary of the APECs has been preliminarily defined by the visual extent of the source zones. The vertical extent of contamination has been preliminarily defined to be a depth of 0.5 mbgs, except at the location of coal dust pile locations CP 11 and CP 39 where the vertical extent has been preliminarily defined at a depth of 1 mbgs. The extent of contamination will be confirmed via post-excavation verification samples, as described in Section 5.0. The verification samples will also be collected to confirm that the remediation objective has been achieved within the APECs.

Once the remedial excavations are complete and confirmation samples confirm remaining soil concentrations are below the remediation objective (i.e., CCME), the excavation areas will be backfilled with clean backfill to grade. It is anticipated that soil excavation activities can be completed within three (3) weeks. Specifically, one (1) week to complete soil excavations and dispose impacted soil off-site, one (1) week for laboratory analysis turn-around of confirmatory environmental samples and one (1) week to address potential data-gaps identified as part of the confirmatory environmental sampling. It is noted that miscellaneous debris encountered at the site will also be disposed off-site as part of soil excavation activities.

3.2.2 Asbestos-Containing Material Abatement

Asbestos-containing building materials (i.e., fragments of vinyl floor tile and “Transite” cement board), have been identified on the ground throughout the site.

The specifications will require removal of confirmed ACMs and disposal at a licensed waste disposal facility capable of (i.e., licensed to) accept and dispose of the ACMs. The specification will also require that the removal of ACMs be conducted by a qualified abatement Contractor using Low Risk (Type 1) Asbestos Work Procedures as defined by SAFE Work Manitoba “Guide for Asbestos Management” (May 2017) and Public Services and Procurement Canada (PSPC) Asbestos Management Standard (updated June 2019).

It is anticipated that asbestos abatement activities can be completed within two (2) weeks.

3.2.3 Site Restoration

After excavation and off-site disposal of soil, and the abatement of ACM, the site will be restored to match pre-remediation grades and materials. The excavated area APEC 1 will be backfilled with clean native material followed by granular fill to match pre-remediation site conditions. The excavated area APEC 2 will be backfilled with clean material (i.e., local native soil) and completed with top soil to support the natural regrowth of the native vegetation to match pre-remediation site conditions. The site will be graded to match the existing finished grades and drainage profile. It is anticipated that site restoration activities can be completed within one (1) week.

4.0 Measures to Alleviate Risk

The specifications will be prepared to require that the Contractor prepare and be capable and ready to implement appropriate construction-related risk management plans including, but not limited to health and safety plan, Environmental Protection Plan, spill contingency plan and logistics management plan. The following sections identify the required contents of these plans.

4.1 Health and Safety Plan

The Contractor will be responsible for site health and safety during construction. To manage potential health and safety risks, specific health and safety responsibilities and requirements of the Contractor will be identified and incorporated into the specifications. The specifications will be developed from Section 01 35 29 – Health and Safety for Contaminated Sites of the standard NMS (National Master Specification), which has been developed to identify scope, regulatory requirements and general methodologies to guide the Contractor in safely completing the work in accordance with applicable regulatory requirements. The Contractor will be required to develop a site specific health and safety plan (SSHSP) for the project within seven (7) days of contract award. The SSHSP will address the following key elements:

- Identification of contaminants of concern;
- Daily job hazard analysis and safety assessment;
- WHMIS and material safety data sheets;
- COVID-19 protocols;
- Personnel training requirements;
- Personal protective equipment program;
- Respirator fit testing;
- Contingency and emergency response procedures;
- Health and safety meetings;
- Regulatory requirements;
- Hazardous communication; and
- Health and safety personnel (e.g., health and safety officer, certified industrial hygienist, certified asbestos abatement professional).

4.2 Environmental Protection Plan

In order to alleviate potential adverse effects to the environment during construction, the specifications will require the Contractor to develop and implement an Environmental Protection Plan (EPP) (i.e., pursuant to Section 01 35 13.43 – Special Project Procedures for Contaminated Sites) that will include, in part, the following key components:

- Name of persons responsible for ensuring adherence to EPP, manifesting hazardous waste, training site personnel;
- Description of the environmental protection personnel training program;
- Erosion and sediment control plan;
- Site access plans and traffic management plans;
- Spill contingency plan (as further detailed in **Section 4.3.2**);
- Hazardous and non-hazardous waste disposal plans;
- Air pollution control plans;
- Contaminant prevention plan;
- Fire contingency plan;
- SAR protection plans; and
- Restoration plan.

4.3 Spills Management and Emergency Response Plan

4.3.1 Spill Prevention

In order to prevent the spill of a hazardous material on-site, the Contractor shall:

- Train personnel on spill prevention and response procedures;
- Provide and maintain spill containment materials on-site suitable to effectively contain or absorb spilled materials (absorbent materials, shovels, booms);
- Follow the hazardous material handling and storage requirements presented in the specifications for the work; and
- Follow the equipment maintenance requirements presented in the specifications for work.

4.3.2 Spill Response

In the event of a spill, the first person on the scene will implement the following procedures:

- Ensure their health and safety and warn nearby co-workers;
- If possible and safe to do, control the spill using spill kits located on-site;
- Call for help and notify the Contractor's Site Supervisor of the location of the spill, substance spilled, estimated amount spilled, the cause of the spill (if known), the location of nearby watercourses; and
- Obtain the assistance of others and begin to contain and clean-up the spill.

The Contractor's Site Supervisor shall:

- Notify the Departmental Representative and PSPC, irrespective of whether the spill had an adverse environmental effect or not;
- Direct that work is promptly halted in the immediate area of the spill if the spill is within 30 m of a watercourse;
- Evaluate the situation and delegate specific actions to staff; and

- Ensure assigned duties are carried out safely.

Restoration of the area impacted by the spill should commence immediately. Any material, including gravel and soil, will be removed and replaced with clean material. Disposal of contaminated materials will be in accordance with applicable government regulations. In the event of large spills, a complete assessment of the extent of contamination and remediation of contaminated soils and materials may be required. The Contractor shall be responsible for any additional studies, remediation and/or restoration efforts. The Departmental Representative will determine the scope of continued monitoring requirements for the spill area.

Training of personnel is the responsibility of the Contractor's Site Supervisor. Site personnel will be trained before commencement of work on the project.

During remediation activities and ACM abatement, the following spill response resources shall be available on-site in readiness to respond to accidental releases of fuels and/or hazardous materials:

- Absorbent materials (e.g., sorbent pads, sorb-all, vermiculite);
- Small equipment such as shovels, rakes, tool kit, sledgehammer, buckets, stakes, tarpaulins, protective equipment; and
- Fire extinguisher.

4.3.3 Spill Reporting

Section 201 of CEPA 1999 requires that notification of an environmental emergency (i.e., a spill) to an enforcement officer or any other person designated pursuant to the Environmental Emergency Regulations be made. Immediately following the discovery of a spill, notification shall be made to Environment and Climate Change Canada, Prairies Region at 1-800-668-6767.

As per requirements under Section 201 of CEPA 1999, following a spill, reporting requirements include the following:

- A verbal notification is to be made as soon as possible under the circumstances to the authorities identified in the Release and Environmental Emergency Notification Regulations (Notification Regulations) under CEPA 1999, which provide the regulated community and the public with the telephone number of the 24-hour authorities operating for the respective province or territory to which notifications are to be made; and
- A written report should be made as soon as possible under the circumstances to the relevant authorities.

The written report should clearly communicate as much information that is available at the time about the spill, including, at a minimum, the following:

- A description of the spill;

- A description of the impact resulting from the spill;
- A description of what was done to minimize the impact; and
- A description of what was done to prevent recurrence of the problem.

4.4 Logistics Management

Given the remoteness of the site, managing the construction process will be critical to the success of the project. The Contractor will be responsible for managing the logistics of the remediation. Special considerations, which will be specified in the specifications, include COVID-19 planning, erosion and sediment control, site remediation, excavating and off-site disposal.

4.5 Regulatory and Administrative Requirements

During the remedial design, applicable permits, notification and approvals will be identified to the extent applicable so that the requirements necessary to obtain the permits or approvals are identified and, as appropriate, applicable provisions will be incorporated into the specifications for the Contractor to pursue. Similarly, applicable bylaws that may affect the remediation project will be identified (i.e., working hours) and incorporated into the specifications.

5.0 Schedule

5.1 Preliminary Construction Schedule

A preliminary construction schedule can be found in Appendix B. It is anticipated that the construction period for this project will be completed over two (2) months during the construction season where there is not a concern of snow cover impacting remediation and abatement activities. The following activities are anticipated to be completed:

- Contractor mobilization;
- Asbestos-containing materials abatement within APEC 3;
- Remove miscellaneous debris within the site;
- Excavate soils within APEC 1 and APEC 2 (contaminated soils to be disposed of in accordance with local regulations); and
- Restore the site to final grades.

6.0 Remedial Action Verification and Monitoring Plan

A Remedial Action Verification and Monitoring Plan (RAVMP) has been developed so that, when implemented, remediation will be shown (and be documented) to have achieved the remediation objective and that remediation has been in accordance with specifications and design drawings and has met the design intent. The RAVMP is comprised of a number of elements including:

Construction Quality Control – The specifications require that the Contractor test and document specific elements of the remediation project to demonstrate that the constructed work and their operations are in accordance with the specifications and design drawings. Specific elements of the constructed product that may require quality control testing and/or verification include:

- Designated substances and hazardous material removal (including characterization for disposal);
- Contaminated soil excavation (including soil characterization for disposal);
- Clean backfill material (including characterization of backfill material source); and
- Site restoration (including final grades).

Construction Quality Assurance (CQA) – Independent of the tender package for the Contractor, a representative of PSPC, independent of the Contractor, will be responsible for assessing the quality control program of the Contractor and confirming that the Contractor conducts the work in adherence to the project specifications. The Construction Quality Assurance representative will review the Contractor's Quality Control (QC) testing results and, where appropriate, conduct independent testing on the construction elements for conformity to the specifications and design drawings. Quality Assurance (QA) testing will be determined based on the professional judgement of the CQA consultant and is anticipated to be conducted at a frequency of ten percent of the QC testing for select elements.

In addition, abatement activities will be monitored by the consultant to verify asbestos-containing building materials have been safely removed from the site and properly disposed of.

Independent Testing – To demonstrate that contaminated soil has been removed, post-excavation confirmation samples will be collected within the excavation by the Consultant to document that the horizontal and vertical extent of contaminated soil has been achieved. It is anticipated that based on best practice in various jurisdictions if the excavated volume is less than 1 m^3 one (1) discrete sample will be collected to characterize the excavation; however if the excavation is greater than 1m^3 discrete samples will be collected from each excavation face so that there is at least one (1) sample within a grid based on 10 metre increments. Based on these requirements it is anticipated that up to 70 samples will be collected and analyzed from the excavations. Prior to allowing backfill operations to proceed, analytical results from the post-excavation confirmation samples will be reviewed and compared to the remediation criteria for approval.

7.0 Summary

The overall remedial objective for the site is to alleviate the environmental liability by the removal of impacted soil and ACM to generic federal criteria within the subject property. Previous ESA activities (Dillon, 2019); identified three (3) potential sources of environmental concern (i.e., APEC 1 to APEC 3) and the preferred remedial approach is an excavation, off-site disposal and site restoration specific to each APEC as followed.

7.1 APEC 1 – Coal Dust Piles

Remediation of the 40 coal dust piles and associated contaminated soil will be conducted by excavation and off-site disposal at a licensed facility. Following excavation, confirmatory soil samples are to be collected by the consultant along the limits and floor of the excavation and analyzed for the contaminants of concern (i.e., BTEX, PHC, PAH and metals) to document that remediation objectives have been met. The excavated area will be backfilled with clean material (i.e., granular material) to surface to match surrounding pre-remediation site conditions. Restoration is to consider potential species at risk (SAR) and SAR habitat requirements which will be outlined in the Contractor's Environmental Protection Plan (see Section 4.2). Given the anticipated depth of excavation (i.e., <1 mbgs), groundwater is not anticipated to be encountered. However, the specifications will incorporate water management provisions that the contractor will need to follow should groundwater be encountered. In addition, Dillon-Outcome will discuss with PSPC on whether a contingency water management budget should be established for this work.

7.2 APEC 2 – Pail Dump Area

Remediation of soil impacts at the pail dump area will be conducted by collection and removal of suspect PHC-containing containers (i.e., pails and drums) followed by excavation and off-site disposal of contaminated soil. The waste and contaminated soil will be disposed of at a licensed facility. Following excavation, confirmatory soil samples are to be collected by the consultant along the limits and floor of the excavation and analyzed for the contaminants of concern (i.e. PHC and chlorinated solvents) to document that remediation objectives have been met. The remedial procedure will be the same as APEC 1. Specifically, the excavated area is to be backfilled with clean material (i.e., local soil and top soil) to surface and completed with a seeding of local vegetation (grasses) to match pre-remediation site conditions. Restoration is to have regard to potential SAR and SAR habitat requirements which will be outlined in the Contractor's Environmental Protection Plan (see Section 4.2). However, the specifications will incorporate water management provisions that the contractor will need to follow should groundwater be encountered. In addition, Dillon-Outcome will discuss with PSPC on whether a contingency water management budget should be established for this work.

7.3 APEC 3 – Asbestos-Containing Building Material

Suspect ACMs, specifically loose fragments of vinyl floor tiles and "Transite" cement board will be recovered, placed in asbestos waste receptacles, removed off-site and disposed of at a licensed disposal facility. It is estimated that there is approximately 2 tonnes of asbestos material at the site. As part of remedial activities, miscellaneous debris encountered throughout the site, including, but not limited to, broken glass, cans, scrap metal, miscellaneous construction debris and household items, will be removed and disposed of at the local landfill or recycling facility for the purpose of general public safety and site aesthetics. It is estimated that there is approximately 15 tonnes of miscellaneous debris scattered throughout the project site primarily surrounding the building foundations. A detailed description of the debris encountered along with GPS points is included in Table 1 as part of Appendix C (Phase I/II ESA Report) as well as the site photographs.

The remedial design as part of this report and subsequent engineering specification package have been developed based on existing documentation. It is noted that conditions found and assumptions made in this report may differ over time and may become apparent during future investigations. As a result, some conditions may not have been detected or anticipated at the time of this work and as such, Dillon-Outcome cannot be held responsible for this.

8.0 Closure

We look forward to working with you on this project. If you have any questions or comments regarding this report, please contact the undersigned at (204) 453-2301 ext. 4023 or email at vkrahn@dillon.ca.

Yours Sincerely,

DILLON CONSULTING LIMITED
IN JOINT VENTURE WITH OUTCOME CONSULTANTS
DILLON-OUTCOME

Vanessa Krahn, M.Sc., P.Eng.
Project Manager

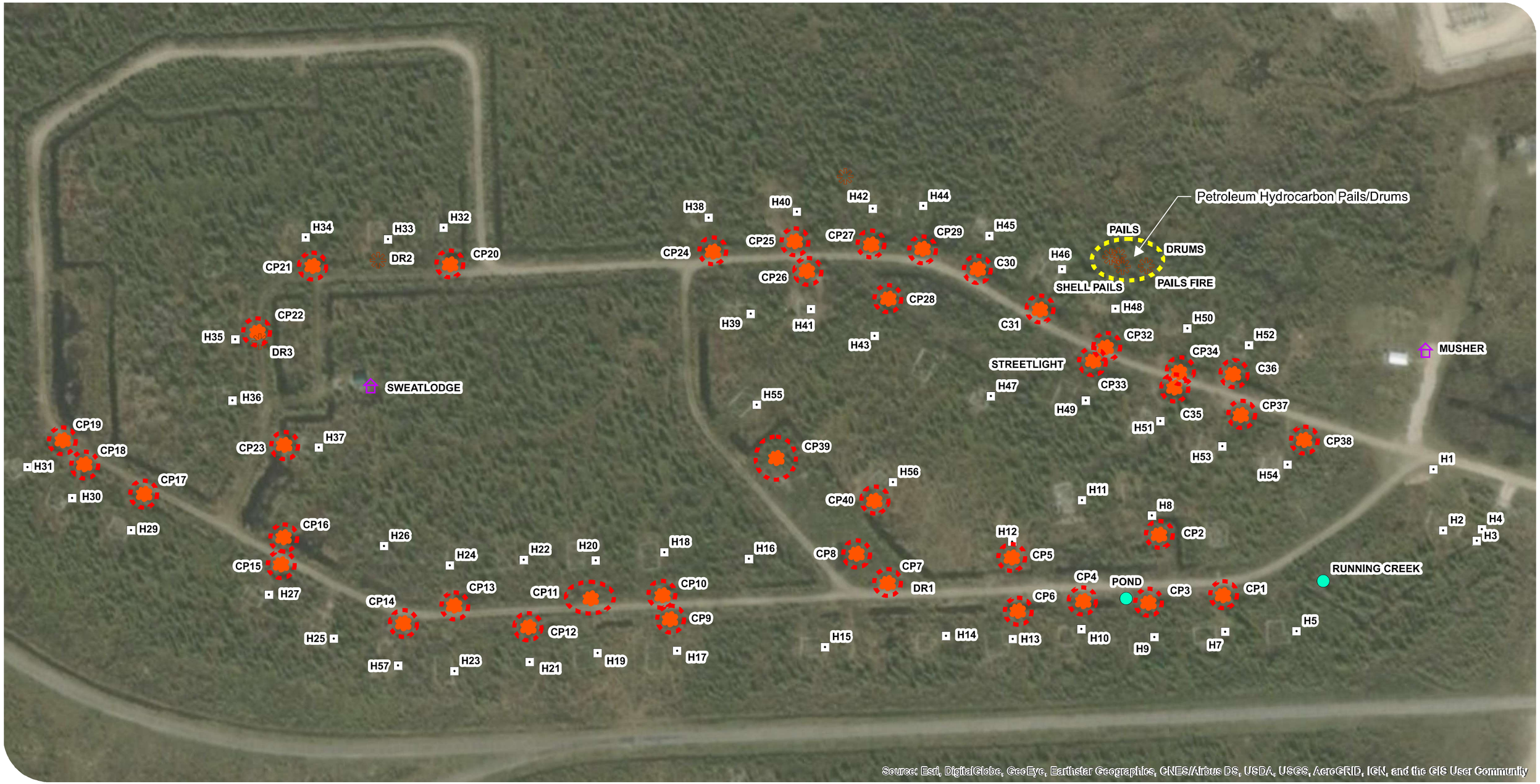
Andrew Thalheimer, P.Eng., QP_{ESA}
Technical Reviewer

NCB:bg

PROVINCE OF MANITOBA
June 2, 2021
V.M.
KRAHN
Member
34912
REGISTERED PROFESSIONAL ENGINEER

Appendix A

Inferred Impacted Soil Extent



REMEDIAL ACTION PLAN
Former Sayisi Dene Village
Churchill, Manitoba

FIGURE 1

Site Plan
Inferred Impacted Soil Extent

Legend

- Building Foundation
- Coal Pile (Dillon, 2019)
- Current Building
- Debris
- Water Body
- Inferred Soil Extent of APEC 1 (Approx. 50m³)
- Inferred Soil Extent of APEC 2 (Approx. 20m³)

Note:
APEC areas are shown at a larger scale for visual clarity.

DILLON CONSULTING

MAP CREATED BY: AAM
MAP CHECKED BY: NLB
MAP PROJECTION: NAD 1983 UTM Zone 15N

0 15 30 60 90 120 Meters

N W E S

FILE LOCATION: G:\GIS\211064 - Churchill Phase\Working

PROJECT: 20-1064 STATUS: DRAFT DATE: February 2021

Appendix B

Preliminary Construction Schedule

Appendix B - Preliminary Construction Schedule
Former Sayisi Dene Village - Remedial Action Plan (DRAFT)
Churchill, Manitoba

Item	WEEKS FOLLOWING RECEIPT OF APPROVAL TO PROCEED WITH PRE-DESIGN ACTIVITIES											
	Week 0	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 6	Week 7	Week 8
Receipt of Approval to Proceed and Project Commencement												
- Mobilization												
- Asbestos-containing materials abatement												
- Miscellaneous Debris Removal												
- Remedial Soil Excavation												
- Site Restoration												

Denotes planned activity

Appendix C

Environmental Site Assessment Report

INCLUDED AS APPENDIX A OF THE SPECIFICATION PACKAGE

References

Canadian Council of Ministers of the Environment (CCME). (2008). Canadian Environmental Quality Guidelines.

Canadian Council of Ministers of the Environment (CCME). (2008). Canada Wide Standards for Petroleum Hydrocarbons in Soil.

Canadian Standards Associated (CSA). (2016). Phase I Environmental Site Assessment Z768-01 (reaffirmed 2016).

Canadian Standards Association (CSA). (2000). Phase II Environmental Site Assessment Z769-00 (re-affirmed 2012).

Environmental Risk Information Services. (2019). Database Report.

Environmental Risk Information Services. (2019). Physical Setting Report.

Manitoba Workplace Safety and Health Regulation. M.R., 217/2006

Natural Resources Canada. (2019). The Atlas of Canada - Toporama.

Public Services and Procurement Canada. (2017). Asbestos Management Standard, updated October 2018.

Radon Environmental Management Corporation. (2011). Radon Potential Map of Canada. Retrieved 10 27, 2017, from Radon Environmental Management Corporation: http://radoncorp.com/mapping/canada-map.php

SAFE Work Manitoba (May 2017). Guide for Asbestos Management.

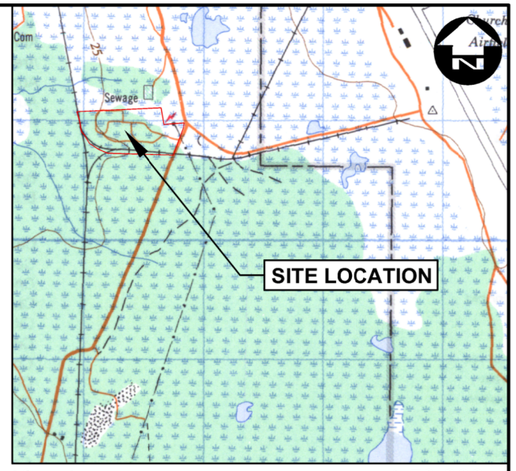
The Weather Network. (2019). Churchill Climate.

APPENDIX C

SITE PLANS

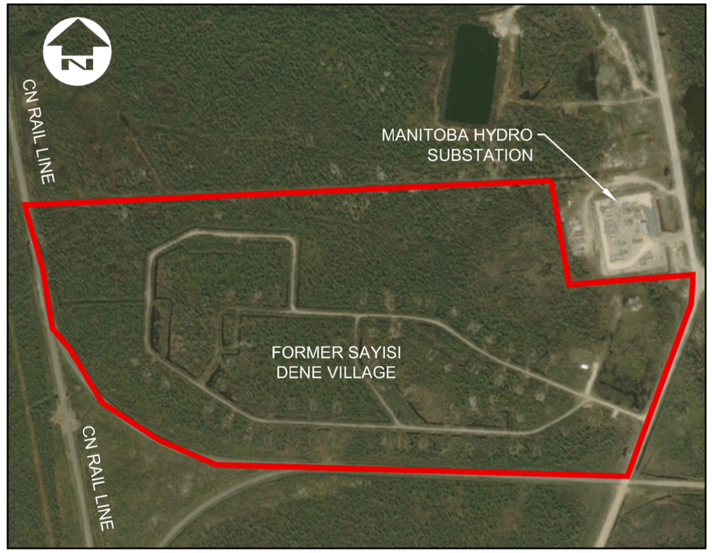
Public Services and Procurement Canada

Services publics et Approvisionnement Canada



Keyplan 1:50 000

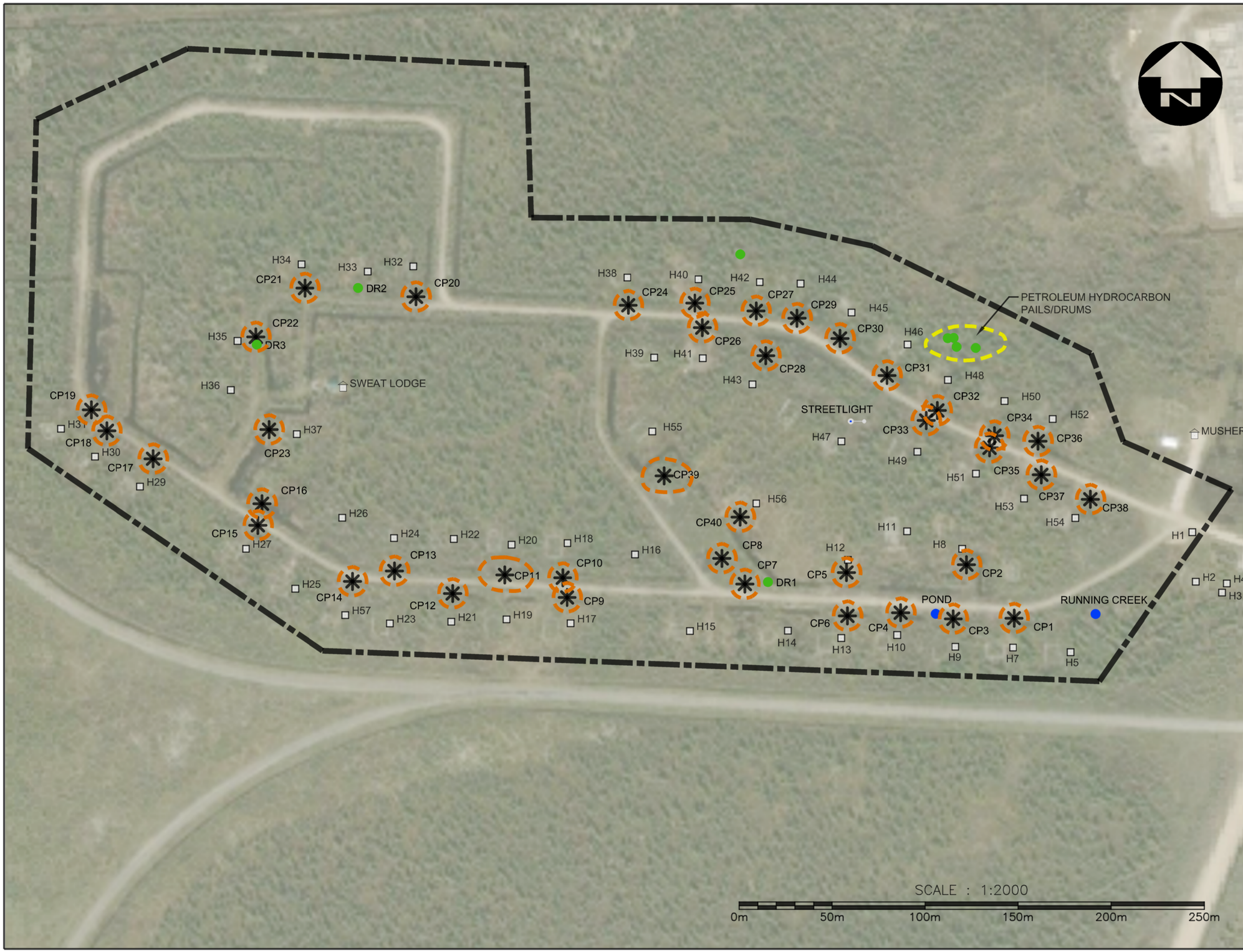
SITE REMEDIATION FORMER SAYISI DENE VILLAGE, CHURCHILL, MB



DRAWING LIST

PROJECT NO. R.089501.002

Canada



Canada

Public Services and Procurement Canada / Services publics et Approvisionnement Canada

Real Property Branch / Direction générale des biens immobiliers

- Building Foundation
- Current Building
- Coal Pile (Dillon, 2019)
- Identified Debris Location
- Waterbody
- APEC 1 - Inferred Soil Extent - (Approx. 115 tonnes)
- APEC 2 - Inferred Soil Extent - (Approx. 50 tonnes)
- Work Area Boundary

revisions	description	date
1	DRAFT	03/16/21

project / projet

Site Remediation Former Sayisi Dene Village Churchill, MB

drawing / dessin

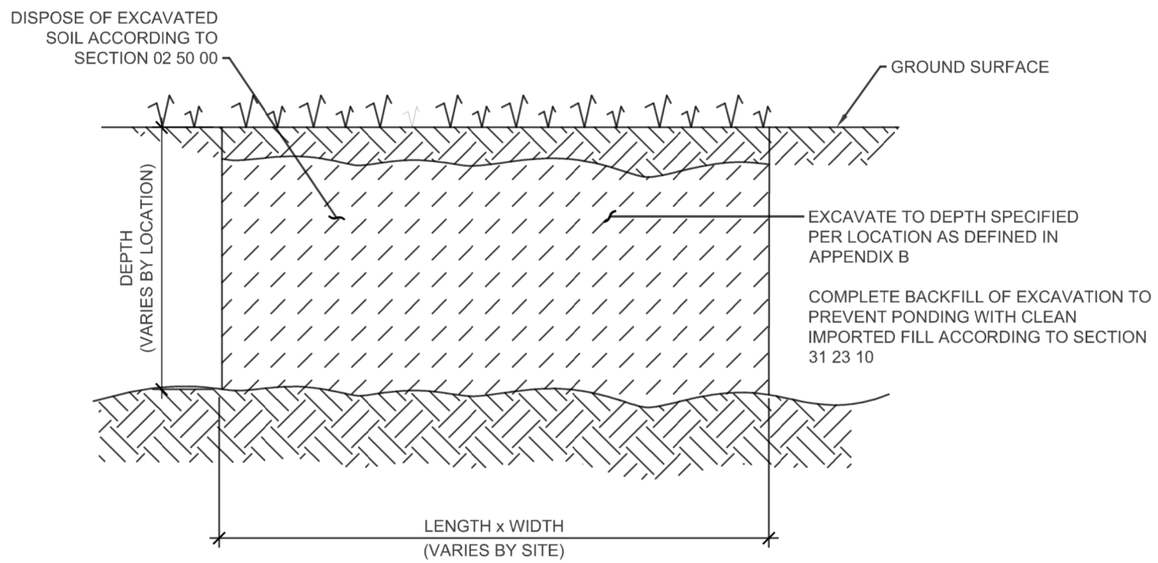
Existing Conditions (APEC #1 and APEC #2)

Designed By / Conçu par	NCB	
Date	2021/03/06	(yyyy/mm/dd)
Drawn By / Dessiné par	HEB	
Date	2021/03/09	(yyyy/mm/dd)
Reviewed By / Examiné par		
Date		(yyyy/mm/dd)
Approved By / Approuvé par		
Date		(yyyy/mm/dd)
Tender / Soumission		
Project Manager / Administrateur de projets		

Project no. / No. du projet: R.089501.002

Drawing no. / No. du dessin: C-02

PWGSC 11X17 (431x279)



TYPICAL EXCAVATION DETAIL

NOT TO SCALE

Canada

Public Service and Procurement Canada | Service publics et Approvisionnement Canada

Real Property Branch | Direction générale des biens immobiliers

Contractor to verify all dimensions & conditions on site and immediately notify the departmental representative of all discrepancies.

revisions	description	date
1	DRAFT	03/16/21

project / projet

Site Remediation
Former Sayisi Dene
Village
Churchill, MB

drawing / dessin

Typical Excavation Details

Designed By / Conçu par	NCB	
Date (yyyy/mm/dd)	2021/03/06	
Drawn By / Dessiné par	HEB	
Date (yyyy/mm/dd)	2021/03/09	
Reviewed By / Examiné par		
Date (yyyy/mm/dd)		
Approved By / Approuvé par		
Date (yyyy/mm/dd)		
Tender / Soumission		
Project Manager / Administrateur de projets		

Project no. / No. du projet: R.089501.002

Drawing no. / No. du dessin: C-03

PWGSC 11X17 (431x279)

APPENDIX D

REMEDIATION AND RISK MANAGEMENT CONSTRUCTION CHECKLIST

SITE REMEDIATION, FORMER SAYISI DENE VILLAGE, CHURCHILL, MANITOBA

This checklist outlines the requirements for remediation construction under the project R.089501 Specifications and is intended to be used as an on-Site tool to ensure that the Work is completed as per the Tender Specifications and Design Drawings prepared for the Site. This checklist may not be comprehensive and the contractor is to refer to both the project Remedial Action Plan and Specification documents for the complete scope of Work.

Table 1: Remediation and Risk Management Construction Checklist

No.	Checklist Item	Completed Y/N	Comments
1	Locate the underground utilities at the Sites, if present, before initiating the remediation construction activities in all Work areas.		
2	Remove hazardous and non-hazardous debris at Area of Potential Environmental Concern (APEC) #3.		Includes loose asbestos-containing building material and debris around the Work area.
3	Find a licensed waste disposal facility that will accept the excavated soil prior to the commencement of remediation activities.		Ensure that the parameters analyzed meet the approval requirements for the landfill sourced for the Work.
4	Excavate soil at APEC #1 and APEC #2.		Confirmatory soil sampling completed by the Departmental Representative must indicate that soil concentrations in the base and sidewalls of the excavations meet the CCME Soil Quality Guidelines for a residential Site, prior to being backfilled.
5	Arrange for the excavated soil to be directly loaded into dump trucks and transported to a licensed waste disposal facility that will accept the soil.		If temporary stockpiling of clean backfill material is required, the Contractor is to ensure that the material is stockpiled on a geomembrane liner and is covered up nightly with a tarp to prevent contamination.
6	Provide proof to the Departmental Representative of the source and quality of the backfill material to be used to reinstate Site conditions.		
7	Provide the weight tickets from the landfill promptly to the Departmental Representative after the completion of the remedial excavation activities.		Weight tickets are the proof of disposal and must be provided for payment of the contractor.
8	Backfill APEC #1 and APEC #2 excavated areas with clean imported backfill material as shown on Drawings and as per the Departmental Representative's direction on the Site.		
9	Reinstate Sites as per Specifications.		

END OF SECTION

APPENDIX E

MITIGATION MEASURE CHECKLIST

SITE REMEDIATION, FORMER SAYISI DENE VILLAGE, CHURCHILL, MANITOBA

Table 1: Mitigation Measures Checklist

No.	Mitigation Item to be Implemented	Compliance Y/N	In NO, Reason for Non-Compliance
1	Work must be scheduled to avoid periods of heavy precipitation and high winds.		
2	Workers who may come in contact with hazardous material must be trained and provided with and use appropriate personal protective equipment. In addition, workers must follow the Project-specific Health and Safety Plan, the Provincial Occupational Health and Safety Act and any other appropriate legislation, regulations, guidelines or best-management practices.		
3	Ensure that non-contaminated construction garbage is removed daily from the Work area and disposed in appropriate waste containers.		
4	Vehicles and machinery must be in good working order, well maintained and operate according to the manufacture's specifications.		
5	Restrict the movement of vehicles and machinery to the Work areas and designated access points. Movement over exposed soil is to be minimized.		
6	Vehicle refueling to occur on impermeable surface.		
7	Erosion control structures (temporary silt fencing, silt curtains, geotextile filter fabric) are to be used, as appropriate, to prevent erosion and release of sediments and/or sediment laden water during the construction phase and inspected daily.		
8	The contractor must have the appropriate containment, spill kit, and clean up equipment on Site.		
9	Abatement activities must be conducted by a qualified contractor to meet regulations, per the Project-specific Health and Safety Plan to meet Health Canada regulations.		

10	Visual Inspections must be conducted daily in order to determine if bird species are on the Site.		
11	The Manitoba Conservation and Climate and/or Environment and Climate Change Canada should be contacted if a SAR is observed within the Site during Project activities and standard protocol should be performed. Federal designations of SAR are listed under Schedule 1 of *SARA.*		
12	Although anticipated to be unlikely, if a migratory bird nest is identified within the project footprint (i.e., property boundary) Work shall halt and Environment and Climate Change Canada/the Canadian Wildlife Service shall be consulted.		
13	If an accidental discovery of artifacts of cultural significance (including to Sayisi Dene First Nation) immediately stop Work and report to the Departmental Representative.		

END OF SECTION