

APPENDIX “A”

Environmental Screening Documentation

**FISHERIES AND OCEANS
CANADIAN ENVIRONMENTAL ASSESSMENT ACT (CEAA) 2012
PROJECT EFFECTS DETERMINATION REPORT**

GENERAL INFORMATION

1. Project Title: Marginal Wharf Reconstruction, Long Cove, NL	
2 Proponent: Fisheries and Oceans Canada, Small Craft Harbours (DFO SCH)	
3. Other Contacts (Other Proponent, Consultant or Contractor): Public Works and Government Services Canada	4. Role: OGD Consultant
5. Source of Project Information: Mike Collins, Senior Project Engineer, DFO SCH Branch	
6. Project Review Start Date: July 4 th , 2016	
7. DFO File No.: 16-HNFL-00245	8. PWGSC File No:
9. TC File No.: NPP # 8200-10-1056/ NEATS: 42525	

BACKGROUND

<p>10. Background about Proposed Development (including a description of the proposed development):</p> <p>DFO SCH proposes to reconstruct a marginal wharf located at the Small Craft Harbour Facility in Long Cove, NL. The project will involve the demolition and removal of an existing cribwork wharf along part of the project footprint. The new construction will include the placement of eleven (11) treated timber cribs with a total outer edge length of the new marginal wharf will be approximately 70 meters.</p>

PROJECT REVIEW

<p>11. DFO's rationale for the project review:</p> <p>Project is on federal land <input checked="" type="checkbox"/> <u>and</u>;</p> <p><input checked="" type="checkbox"/> DFO is the proponent</p> <p><input type="checkbox"/> DFO to issue <i>Fisheries Act</i> Authorization or <i>Species at Risk Act</i> Permit</p> <p><input type="checkbox"/> DFO to provide financial assistance to another party to enable the project to proceed</p> <p><input type="checkbox"/> DFO to lease or sell federal land to enable the project to proceed</p> <p><input type="checkbox"/> Other</p>	
12. Fisheries Act Sections (if applicable): n/a	
<p>13. Other Authorities</p> <p>Transport Canada, Navigation Protection Program and Environmental Affairs and Aboriginal Consultation Unit</p>	<p>14. Other Authorities rationale for involvement:</p> <p><i>Navigation Protection Act</i></p>

15. Other Jurisdiction: Department of Environment and Conservation, Pollution prevention Division, Service NL, and Water Resources	
16. Other Expert Departments Providing Advice: Fisheries and Oceans Canada, Fisheries Protection Program	17. Areas of Interest of Expert Departments: <i>Fisheries Act</i>
18. Other Contacts and Responses:	
19. Scope of Project (details of the project subject to review): <p><u>Project Description</u></p> <p><u>Construction/Installation:</u></p> <p>The proposed project involves the reconstruction of an existing marginal wharf. The final reconstructed wharf will be an L-shaped cribwork marginal wharf that consists of 11 cribs with a total length of approximately 70 meters.</p> <p>The project will include the demolition and removal of the existing crib wharf (and all underlying cribwork) in its entirety. The wharf consists of creosote timber cribwork and concrete decking. A portion of the existing asphalt parking lot will be cut away to allow for the reconstruction of the wharf. To facilitate the southern arm of the new wharf, and existing floating dock crib will be demolished and completely removed. The existing floating docks, chain, concrete anchor blocks and gangway will be temporally removed, stored on site and re-connected to the new marginal wharf.</p> <p>The project requires excavation of the approach area behind the wharf and the removal of existing stone barricades. The berthage area of the new L-shaped marginal wharf will require dredging to -3.5 m below LNT. It is estimated that 920 m3 will be removed from the site. The northern portion of the wharf will require additional dredging to hard ground and the laying of a rock mattress with scour protection.</p> <p>The new marginal structure will be constructed of treated timber cribbing and concrete decking, seated on a rock mattress with scour protection. The new structure will also include wheel guards, fenders, ladders, and mooring cleats. The extension will be placed tight against the existing infrastructure. The new approach will have a new granular base blended into the existing gravel area and new asphalt will be applied to blend into the existing parking area.</p> <p><u>Operation</u></p> <p>The Environmental Management System (EMS) with an integrated Environmental Management Plan (EMP) for the Harbour Authority of Long Cove will cover operational aspects of environmental management at the harbour (fuelling, waste disposal, activities on the property and water).</p> <p><u>Decommissioning</u></p> <p>This facility is not presently planned to be decommissioned. At the time of decommissioning, Small Craft Harbours will develop a site-specific re-use or reclamation plan that is appropriate for the applicable environmental legislation and Fisheries and Oceans Canada policies.</p> <p><u>Scheduling</u></p> <p>Subject to regulatory approval and DFO SCH operational priorities and funding, this project may commence during the Summer of 2016.</p>	

20. Location of Project:

Long Cove is a fishing community located in Trinity Bay approximately seventeen (17) kilometres northwest of the Town of Whitbourne in the electoral district of Avalon at coordinates 47° 33' 58" N, 53° 40' 01" W. It is accessible via local roads from provincial route 201.

21. Environment Description:

Physical Environment

The proposed project site is located on the western side of a sheltered harbour in Long Cove. The approach to the existing wharf structure consists of an asphalt parking lot connected to a gravel access road. The existing approach on the southern section of the proposed marginal wharf consists of a gravel bank with stone barricades in place. The immediate project area is a level peninsula that is developed with fishing infrastructure, including marginal wharfs, a finger pier wharf, floating docks, and a fish plant.

The shoreline of the immediate project site is characterized primarily by bedrock and gravel, and marine infrastructure. The substrate beneath the proposed wharf is a red mudstone bedrock dipping away from the shoreline, which is overlain by a silty sand and gravel of varying thickness. The proposed project site is located within the Southeastern Barrens Subregion of the Maritime Barrens Ecoregion. This ecoregion has the coldest summers with frequent fog and strong winds. Winters are relatively mild with intermittent snow cover particularly near the coastline.

Biological Environment

Characteristic wildlife for the area surrounding the project site includes rabbit, moose, red squirrel, fox and a variety of songbirds, waterfowl and raptors. Marine mammals such as seals may also frequent the project area.

Species at Risk (Aquatic and Terrestrial)

A search of the Atlantic Canada Conservation Data Centre (ACCDC) database was conducted which produced a list of rare/unique species (i.e. plants and animals) within a 5 km buffer zone (standard ACCDC procedure) of the site of the proposed work. No species were reported within this buffer.

The proposed project is located within the distribution range of the Blue Whale (Atlantic Population), the North Atlantic Right Whale, the Barrow's Goldeneye (Eastern Population), the Red Crossbill (*Percna* Subspecies) and the Monarch butterfly, all placed on Schedule 1 of the *Species at Risk Act* by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). However, the proposed project site is not likely to provide critical or limiting habitat for any of these species and does not contain any environmental components that are considered to be important, sensitive, threatened or endangered that are likely to be affected by the project.

22. Scope of Effects Considered (sections 5(1) and 5(2)):

Table 1: Potential Project / Environment Interactions Matrix

Project Phase / Physical Work/Activity	As per Section 5(1)			Section 5(1c) Aboriginal Interest				Section 5(2)			Due Diligence			
	Fish (Fisheries Act)	Aquatic Species (SARA)	Birds (MBCA)	Health and Socio economic	Physical and cultural heritage	Land use	*HAPA Significance	Health and Socio economic	Physical and cultural heritage	*HAPA Significance	Water (ground, surface, drainage, etc)	Terrestrial / Aquatic Species	Soil	Air Quality
Construction/Installation														
Dredging/Excavation	P	-	-	-	-	-	-	P	-	-	P	P	P	P
Old Wharf Demolition	P	-	-	-	-	-	-	P	-	-	P	P	-	P
Wharf construction	P	-	-	-	-	-	-	P	-	-	P	P	-	P
Operation / Maintenance	P	-	-	-	-	-	-	-	-	-	P	-	-	-
Decommissioning / Abandonment	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*structure, site or thing that is of historical, archaeological, paleontological or architectural significance.
Legend: P = Potential Effect of Project on Environment; '-' = No Interaction

Navigation Consideration

Environmental effects of the project on navigation are taken into consideration as part of the environmental assessment only when the effects are indirect, i.e. resulting from a change in the environment affecting navigation. Direct effects on navigation are not considered in the environmental assessment, but any measures necessary to mitigate direct effects will be included as conditions of the *Navigation Protection Act* approval.

- ☒ Only direct effects are identified; therefore the effects of the project on navigation are not addressed in this environmental assessment.
- ☐ Indirect effects were identified and have been addressed in this environmental assessment.

23. Environmental Effects of Project:

Potential Project/Environment Interactions and their effects are outlined below:

Fish:

- Sedimentation as a result of wharf demolition, dredging, and construction may negatively impact fish and quality of potential fish habitat at the immediate project site.
- Accidental discharge of heavy machinery fuel/fluids or hazardous substances could negatively impact fish and potential fish habitat.
- Dredging at the site will destroy potential fish habitat within project footprint.

Health and Socio economic:

- Potential for safety hazards to workers during demolition and construction activities.

Water:

- Sedimentation as a result of wharf preparation, construction and upland development may negatively impact marine water quality at the immediate project site.
- Construction related refuse may be deposited in water-body, decreasing marine water quality.
- Accidental discharge of heavy machinery fuel/fluids or hazardous substances (e.g. concrete washwater) may result in a decrease of marine water quality.
- Dredging activities resulting in a sedimentation event within the water column.
- Construction activities taking place near the shoreline may result in run off / erosion.

Aquatic species:

- Sedimentation as a result of preparation and construction may negatively impact aquatic species present at the immediate project site.
- Accidental discharge of heavy machinery fuel/fluids or hazardous substances (e.g. concrete washwater) could negatively affect aquatic species present at the immediate project site.
- Dredging at the site will destroy flora and any sessile fauna within project footprint.

Soil:

- Improper disposal of dredge spoils and demolition timber may result in contamination of soils.
- Project activities could potentially result in soil contamination due to improper disposal of dredge material or to some type of mechanical malfunction resulting in a hydrocarbon spill.
- Construction activities at site or natural events (e.g. rainfalls) could result in erosion / sedimentation events.

Air quality:

- Construction activities may result in nuisance impacts due to noise and dust.
- Improper storage/disposal of dredge spoils may result in unpleasant odours and provide annoyance to facility users and nearby residents.

24. Mitigation Measures for Project (including Habitat Compensation):

Work should be scheduled to avoid periods of heavy precipitation. Erosion control structures (temporary matting, geotextile filter fabric) are to be used, as appropriate, to prevent erosion and release of sediment and/or sediment laden water during the construction phase.

Minimize duration of in-water work wherever possible.

Conduct in-water work during periods of low tide, to further reduce the risk to fish and their habitat.

Develop and implement an Erosion and Sediment Control Plan for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. Erosion and sediment control measures should be maintained until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the waterbody or settling basin and runoff water is clear. The plan will, where applicable, include:

- Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering the water body;
- Site isolation measures (e.g., silt boom or silt curtain) for containing suspended sediment where in-water work is required (e.g., dredging, underwater cable installation);
- Measures for containing and stabilizing waste material (e.g., dredging spoils, construction waste and materials, commercial logging waste, uprooted or cut aquatic plants, accumulated debris) above the high water mark of nearby waterbodies to prevent re-entry;
- Regular inspection and maintenance of erosion and sediment control measures and structures during the course of construction;
- Repairs to erosion and sediment control measures and structures if damage occurs;
- Removal of non-biodegradable erosion and sediment control materials once site is stabilized.

Work should be properly timed to avoid potential interference with commercial and/or recreational fisheries.

All wastes should be recycled where possible or otherwise disposed of appropriately.

All crib backfill material should be clean and obtained from an approved quarry.

Materials should never be removed directly from any watercourse, or shoreline area for use as ballast.

All drainage and wash water from concrete production should be properly contained and should not drain into the marine environment.

There should be no sedimentation events as a result of proposed activities. If required, mitigation measures must be implemented such as installation of a turbidity barrier, construction of sediment ponds, etc.

Machinery should be well muffled and local municipality construction by-laws must be adhered to.

Machinery must be checked for leakage of lubricants or fuel and must be in good working order.

Refueling must be done at least 100m from any water body. Basic petroleum spill clean-up equipment should be on-site. All spills or leaks should be promptly contained, cleaned up and reported to the 24-hour environmental emergencies report system (1-800-563-9089). The proponent should consider developing a contingency plan specific to the proposed undertaking to enable a quick and effective response to a spill event.

The proponent must ensure that all waste material will be disposed of in an environmentally acceptable manner in accordance with applicable Provincial Regulations.

Any hazardous materials produced as a result of this project are to be transported off-site for disposal/treatment at an approved waste handling facility, pursuant to applicable provincial substances from entering the water.

Shoreline disturbance should be restricted to the immediate work area, Disturbed shorelines should be stabilized.

Conduct work in a manner that prevents the release of debris (i.e., cribbing, ballasts, etc.) or sediments into the water.

Site access must be restricted to authorized workers only.

Workers in contact with hazardous materials (e.g. explosives) must be provided with and use appropriate personal protective equipment.

Proper safety procedures must be followed during the duration of the project as per applicable municipal, provincial, and federal regulations.

Employees will be trained in health and safety protocols (e.g. safe work practices, emergency response).

Several environmental approvals / permits have been obtained on behalf of SCH. These include:

1. NPP may provide an approval for the proposed alteration of the lawful work under the *Navigation Protection Act*. Any conditions outlined will have to be met.
2. Fisheries and Oceans provided mitigation measures for the protection of fish and fish habitat.
3. Service NL provided approval for sediment to be disposed of at an approved landfill site.

These approvals are attached and all conditions/mitigation measures must be reviewed and implemented by the contractor.

The proponent should ensure that copies of all regulatory approvals are available on-site during project activities.

25. Significance of Adverse Environmental Effects of project:

Significant adverse environmental effects are unlikely, taking into account mitigation measures.

26. Other Considerations (Public Consultation, Aboriginal Consultation, Follow-up)

Public Consultation

The proposed project will provide safer and more secure access for vessels utilizing this facility. No negative public concern is expected as a result of this project. As such, public consultation was not deemed necessary as part of this determination.

Aboriginal Consultation

Aboriginal fishers are not known to utilize the Long Cove SCH facility, nor are there any known aboriginal groups in the surrounding area. As such, aboriginal consultation was not deemed necessary as part of this determination.

Government Consultation

Federal and provincial authorities likely to have an interest in the project were consulted by Public Works & Government Services Canada, Environmental Services, during the course of this assessment. A project description was distributed to the following authorities:

- Fisheries and Oceans Canada – Fisheries Protection Program (DFO FPP)
- Transport Canada – Navigation Protection Program (TC NPP)
- Service NL – Approval for Landfill Disposal of Dredged Material
- NL Department of Environment and Climate Change, Pollution Prevention Division (NLDOEC PPD)

Mitigations prescribed by DFO FPP have been incorporated into this report and may also be found in Appendix C. It is the proponents' responsibility to ensure that appropriate mitigation measures are adhered to.

A *Navigation Protection Act* approval may be issued for this project. The proponent is required to adhere to any conditions stipulated within the permit.

Service NL were provided with sediment sampling results and have issued an approval for the disposal of dredge spoils at an approved landfill, pending prior approval from the site owner/operator.

NLDOEC PPD, based on several timber samples collected from the existing wharf structure (Appendix D), indicated the treated timber wastes produced as a result of the project are permitted for disposal at an approved provincial landfill.

All expert advice/specialist information provided by the above noted departments has been incorporated into this document.

Accuracy and Compliance Monitoring

A follow-up program (as defined in S. 2(1) and as applicable to non-designated projects on federal lands) is a program for determining the effectiveness of any mitigation measures. Site monitoring (accuracy and compliance monitoring) may be conducted to verify whether required mitigation measures were implemented. The proponent must provide site access to Responsible Authority officials and/or its agents upon request.

27. Other Monitoring and Compliance Requirements (e.g. *Fisheries Act* or *Species at Risk Act* requirements)

n/a

CONCLUSION

28. Conclusion on Significance of Adverse Environmental Effects:

The Federal Authorities have evaluated the project in accordance with Section 67 of *Canadian Environmental Assessment Act (CEAA), 2012*. On the basis of this evaluation, the departments have determined that the project is not likely to cause significant adverse environmental effects with mitigation and therefore can proceed using mitigative measures as outlined.

29. Prepared by:



30. Date: July 28, 2016

31. Name: Cathy Martin

32. Title: Environmental Specialist, PWGSC-ES

DECISION

33. Decision Taken

- ☒ DFO may exercise its power, duty or function, i.e. may issue the authorization - where the project is not likely to cause significant adverse environmental effects. Confirm below the specific power, duty or function that may be exercised.
- ☐ DFO to issue *Fisheries Act* Authorization or *Species at Risk Act* Permit
 - ☒ DFO to proceed with project (as proponent)
 - ☐ DFO to provide financial assistance for project to proceed
 - ☐ DFO to provide federal land for project to proceed
- ☐ DFO has decided not to exercise its power, duty or function because the project is likely to cause significant adverse environmental effects.
- ☐ DFO to ask the Governor in Council to determine if the significant adverse environmental effects are justified in the circumstances

34. Approved by: _____


35. Date: _____

36. Name: Paul Curran

37. Title: Regional Engineer, DFO-SCH, NL

38. References: n/a

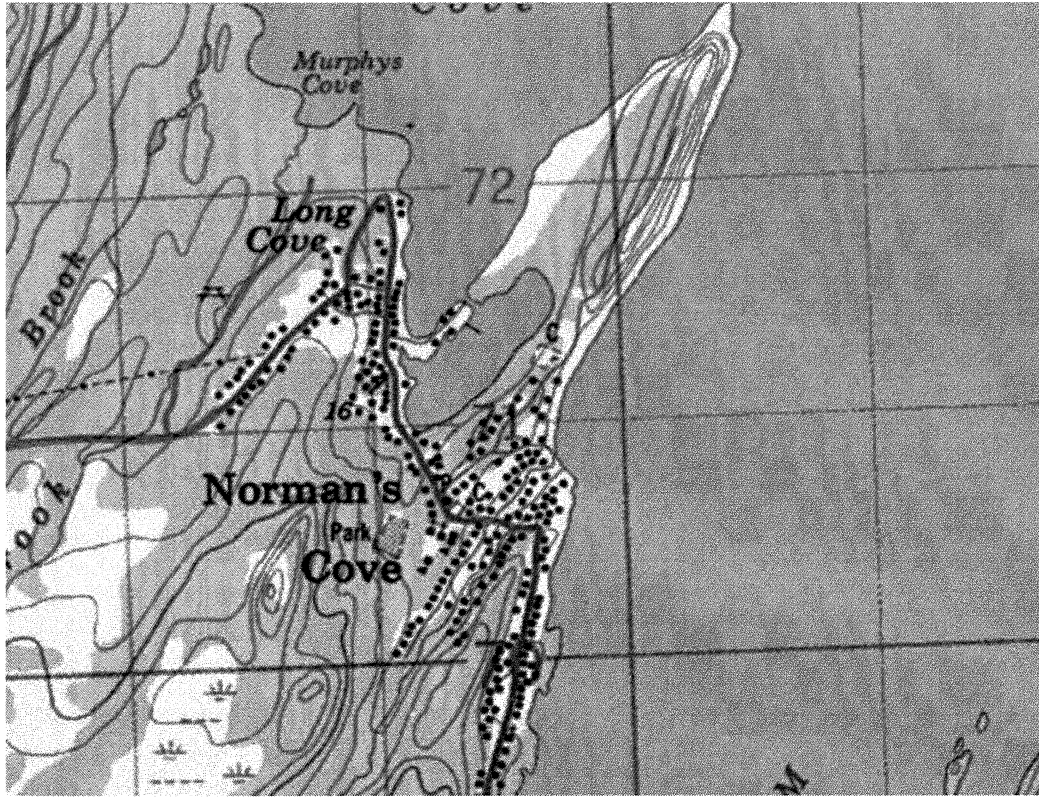
TRANSPORT CANADA RECOMMENDATION

Project Title:	Marginal Wharf reconstruction, Long Cove, NL	
TC File No.:	NEATS: 42525	
NPP File No.:	8200-10-1056	
Environmental Review Decision:	Taking into account the implementation of any mitigation measures that Transport Canada considers appropriate, the project is not likely to cause significant adverse environmental effects and, as such, Transport Canada may exercise any power or perform any duty or function that would permit the project to be carried out in whole or in part.	
Prepared by:	Melissa Ginn Environmental Officer Environmental Affairs and Aboriginal Consultation Unit	
Signature:		Date: August 15, 2016
Mailing Address:	10 Barter's Hill, St. John's, NL	
Tel:	709-351-3200 / 709-772-3088	
Fax:	709-772-3072	
Email:	melissa.ginn@tc.gc.ca	
Recommended by:	J. Jason Flanagan Senior Environmental Assessment Officer Environmental Affairs and Aboriginal Consultation Unit	
Signature:		Date:
Approved by:	Kevin LeBlanc Regional Manager Environmental Affairs and Aboriginal Consultation Unit	
Signature:		Date:

APPENDICES

- Appendix A - Topographic Map and Aerial Photographs
 - Appendix B: Site Plan
- Appendix C: Regulatory approvals/responses
 - Appendix D: Timber analytical results
 - Appendix E: Sediment analytical results

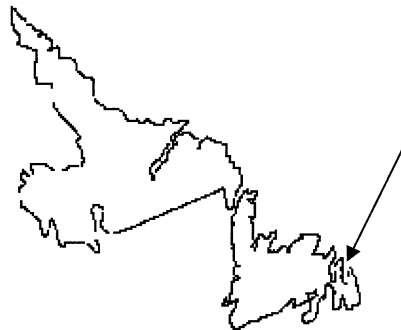
Appendix A
Topographic Map and Aerial Photo

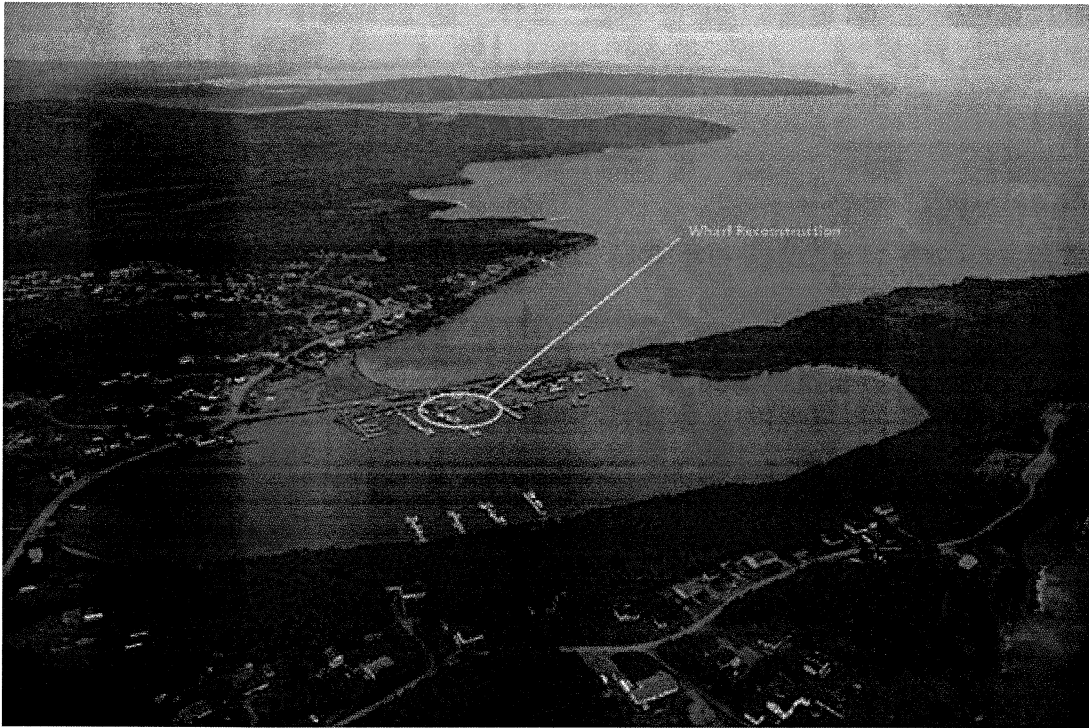


Description

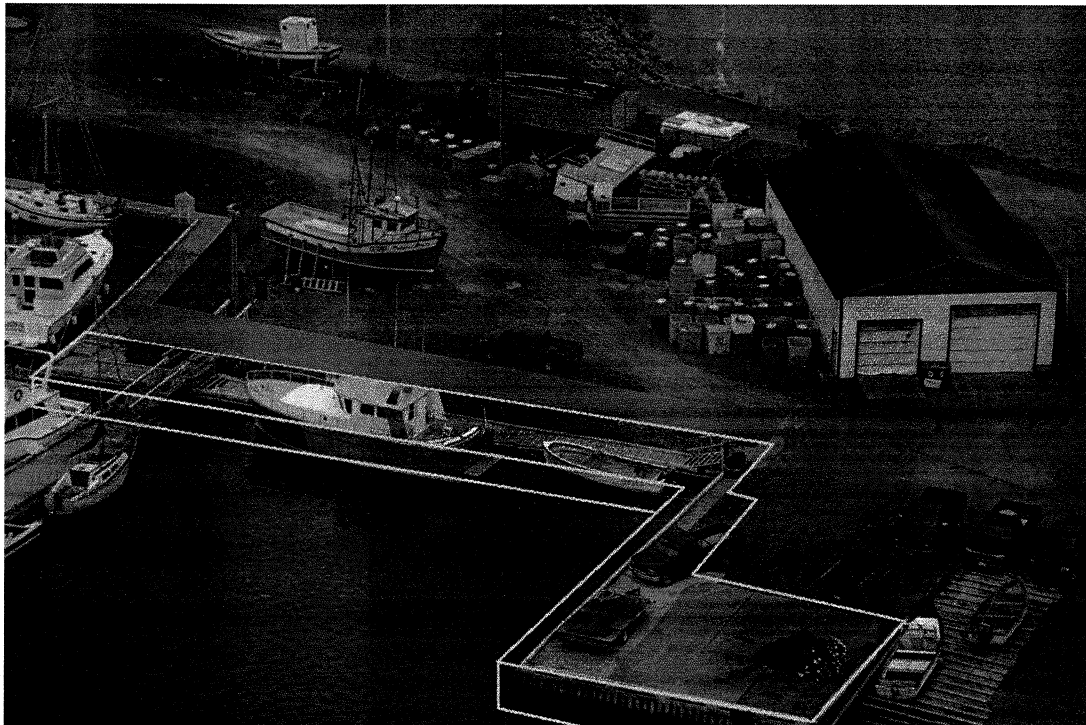
Appendix A-1
 Topographic Map of Proposed Site
 Location: Long Cove, NL

NTS Mapsheet 01-N-12 – Dildo



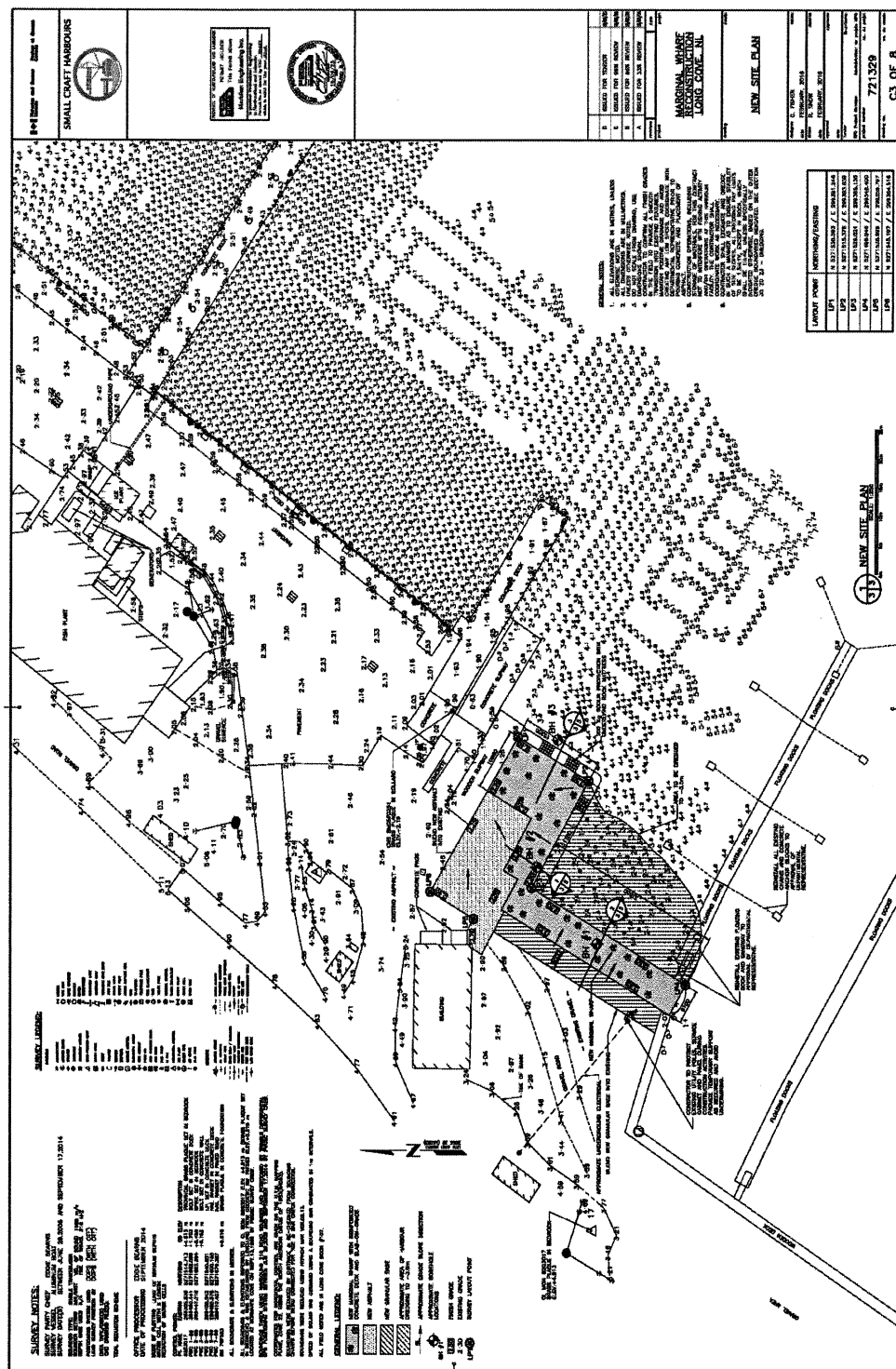


Appendix A-2: Aerial Photo indicating site of marginal wharf reconstruction (photo courtesy of DFO, 2010)



Appendix A-3: Photo indicating proposed marginal wharf reconstruction (photo courtesy of DFO, 2010)

Appendix B
Site Plan of proposed project



Appendix B-1: Wharf Site Plan indicating proposed wharf reconstruction

Appendix C
Regulatory approvals/responses

Mark McNeil

From: Hann, Joan <joanhann@gov.nl.ca>
Sent: August-18-16 8:44 AM
To: Mark McNeil
Cc: Locke, Robert C
Subject: FW: Service NL Referral for Treated Timber Disposal - DFO SCH Eastern Area - Long Cove, NL

Hello Mark

Based upon the results provided above for TWW this material is permitted for disposal to an **approved WDS**. Please contact SNL for details.

Regards

From: Mark McNeil [mailto:Mark.McNeil@pwgsc-tpsgc.gc.ca]
Sent: Wednesday, August 17, 2016 3:04 PM
To: Hann, Joan
Cc: Cathy Martin
Subject: Service NL Referral for Treated Timber Disposal - DFO SCH Eastern Area - Long Cove, NL

Good afternoon Joan,

Please find attached an application for approval to dispose of creosote treated timber from the demolition of a DFO SCH wharf located in Long Cove, NL. I've also attached a copy of the analysis from the lab.

I'm not sure who the Service NL representative is for this area. If you could kindly include them on your response I would appreciate it.

If you need anything else just let me know.

Thanks,
Mark

Mark McNeil, M.Sc.

Environmental Services | *Services écologiques*

Public Services and Procurement Canada | *Services Publics et Approvisionnement Canada*

Suite 204, 1 Regent Square, Corner Brook, NL A2H 7K6 | *Pièce 204, 1 Place Regent, Corner Brook, TN A2H 7K6*

mark.mcneil@pwgsc-tpsgc.gc.ca

Tel: (709) 637-4481 | *facsimile/télécopieur (709) 637-4566*

Mobile: (709) 632-8516 | *cellulaire (709) 632-8516*

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Mark McNeil

From: Adams, Barry <BarryAdams@gov.nl.ca>
Sent: August-24-16 11:53 AM
To: Mark McNeil
Subject: RE: Service NL Application - Sediment Disposal, Lawn, NL

Hi Mark:

Sorry for the confusion.

Based upon the submitted report for the Marginal Wharf Reconstruction project at **Long Cove**, please consider this your approval to dispose of the dredged material at an Approved Waste Disposal Site with the permission of the site owner/operator.

As usual, if there are any odor/fly issues with the dredged material, it should be covered with a layer of clean, non-dredged material or hydrated lime.

Cheers,
Barry



Fisheries and Oceans Pêches et Océans
Canada Canada

P.O. Box 5667
St. John's, NL A1C 5X1

August 17, 2016

Your file *Votre référence*

Our file *Notre référence*
16-HNFL-00245

Mr. Paul Curran
Fisheries and Oceans Canada
Small Craft Harbours Branch
10 Barter's Hill, St. John's NL A1C 5T2

Dear Mr. Curran:

Subject: Implementation of mitigation measures to avoid and mitigate serious harm to fish – Wharf Demolition, Replacement, and Dredging, Long Cove, NL

The Fisheries Protection Program (the Program) of Fisheries and Oceans Canada received your proposal on July 11, 2016. Your proposal has been reviewed to determine whether it is likely to result in serious harm to fish which is prohibited under subsection 35(1) of the *Fisheries Act*.

The proposal has also been reviewed to determine whether it will adversely impact listed aquatic species at risk and contravene sections 32, 33 and 58 of the *Species at Risk Act*.

Our review consisted of:

- DFO Request for Review Application; and
- Project description, site photographs and project drawings

We understand that you propose to complete the following works/undertaking/activities to improve existing facilities at Bay de Verde Harbour:

- Demolish / remove the existing timber crib marginal wharf (~37.5 m x ~4 m) and floating dock structures;
- Construct a new timber crib marginal wharf (~72.5 m (L) x ~6.1 m (W)) within the footprint / location of the demolished marginal wharf and floating dock structures; and
- Dredge and remove substrate material (e.g. small rock, gravel, sand) from an area (~ 660 m²) of the existing boat basin adjacent to the new marginal wharf structure to provide safe vessel access and berthage.

To avoid the potential of serious harm to fish and their habitat we are recommending, in addition to the measures described within your submitted application, that the following mitigation measures be included into your plans:

*

Canada

.../2

- The project should be carried out in a manner that minimizes the release of sediment and/or other project related material into the waters of Long Cove or any other adjacent water body.
- Project related activity – e.g. wharf demolition, timber crib placement, and dredging - should be carried out during low tide and low wind/wave conditions.
- Project related activity should be suspended, and/or additional mitigation measures (i.e. deployment of a floating sediment boom/curtain) if wind or tide conditions cause sediment / turbid water to be visible outside the immediate project area.
- Rock material for timber crib ballast and backfill should be clean rock free of fine erodible material and sized to resist displacement during storm and/or flood events.
- Rock material should not be end dumped; rather it should be dumped on land and placed on station using an excavator or similar equipment.
- Shoreline disturbance should be restricted to the immediate project related work area; any shoreline areas disturbed by project related activity should be stabilized as soon as possible to prevent erosion.
- All dredged or excavated material should be disposed of at an approved site above the high water mark. If necessary adequate sedimentation control measures should be deployed around stored dredge material to minimize potential erosion and sedimentation from the material.

Provided that these mitigation measures are incorporated into your plans, the Program is of the view that your proposal will not result in serious harm to fish. The Program is also of the view that your proposal will not contravene sections 32, 33 or 58 of the *Species at Risk Act*. No formal approval is required from the Program under the *Fisheries Act* or the *Species at Risk Act* in order to proceed with your proposal.

If your plans have changed or if the description of your proposal is incomplete, or changes in the future, you should consult our website (<http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html>) or consult with a qualified environmental consultant to determine if further review is required by the Program.

A copy of this letter should be kept on site while the work is in progress. Please contact Darrin Sooley (phone (709) 772-3521, fax 709 772-5562 or email darrin.soley@dfo-mpo.gc.ca) if you have any questions in this respect and to provide notification 10 days prior to commencement of the proposed project. Please refer to the file number referenced above when corresponding with the Program.

Sincerely,



Tilman Bieger
Manager, Fisheries Protection - Regulatory Reviews
Ecosystems Management Branch
NL Region

Cc: Cathy Martin – PWGSC, St. John's

Appendix D
Timber Sampling Results

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICE
JOHN CABOT BLDG, 10 BARTERS HILL, BOX 4600
ST. JOHNS, NL A1C5T2
(709) 772-5396

ATTENTION TO: Cathy Martin

PROJECT: AGAT16-20 700358341/R.049540.019

AGAT WORK ORDER: 16X121902

TRACE ORGANICS REVIEWED BY: Kelly Hogue, Operations Manager

DATE REPORTED: Aug 16, 2016

PAGES (INCLUDING COVER): 5

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (902) 468-8718

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V1)

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Member of: Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA)
Western Enviro-Agricultural Laboratory Association (WEALA)
Environmental Services Association of Alberta (ESAA)

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Results relate only to the items tested and to all the items tested
All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request



AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 16X121902

PROJECT: AGAT16-20 700358341/R.049540.019

ATTENTION TO: Cathy Martin

SAMPLED BY:

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICE

SAMPLING SITE: Long Cove, NL

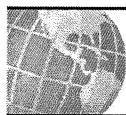
11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
<http://www.agatlabs.com>

PWGSC NL - Timber Package B (TCLP BNA)					
DATE RECEIVED: 2016-08-01			DATE REPORTED: 2016-08-16		
SAMPLE DESCRIPTION: SAMPLE #1 SAMPLE #2					
SAMPLE TYPE:		TIMBER		TIMBER	
DATE SAMPLED:		8/1/2016		8/1/2016	
G / S		RDL		7745497 7745498	
Parameter	Unit				
Cresols	mg/L	0.012	0.25	0.29	
Ortho-Cresol	mg/L	0.004	0.098	0.14	
Meta & Para-Cresol	mg/L	0.008	0.15	0.15	
Benzo(a)pyrene	mg/L	0.001	0.001	<0.001	
Pentachlorophenol	mg/L	0.005	<0.005	<0.005	
Surrogate	Unit	Acceptable Limits			
	%	50-130		58	53
Chrysene-d12					

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard
7745497-7745498 Analysis was performed on the leachate.

Certified By:

Kelly Hogue



Quality Assurance

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICE

AGAT WORK ORDER: 16X121902

PROJECT: AGAT16-20 700358341/R.049540.019

ATTENTION TO: Cathy Martin

SAMPLING SITE: Long Cove, NL

SAMPLED BY:

Trace Organics Analysis

RPT Date: Aug 16, 2016			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE		MATRIX SPIKE	
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits	Recovery	Acceptable Limits	Recovery	Acceptable Limits
								Lower		Upper		Lower

PWGSC NL - Timber Package B (TCLP BNA)

Cresols	TW	< 0.012	< 0.012	NA	< 0.012	94%	60%	130%	110%	35%	110%	115%	30%	130%
Ortho-Cresol	TW	< 0.004	< 0.004	NA	< 0.004	100%	50%	130%	124%	50%	130%	114%	50%	130%
Meta & Para-Cresol	TW	< 0.008	< 0.008	NA	< 0.008	87%	50%	130%	128%	50%	130%	117%	50%	130%
Benzo(a)pyrene	TW	< 0.001	< 0.001	NA	< 0.001	128%	60%	130%	85%	60%	130%	78%	60%	130%
Pentachlorophenol	TW	< 0.005	< 0.005	NA	< 0.005	104%	60%	130%	116%	60%	130%	110%	60%	130%

Comments: Tap water analysis has been performed as QC sample testing for duplicate and matrix spike due to insufficient sample volume.
When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By:

Method Summary

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICE

AGAT WORK ORDER: 16X121902

PROJECT: AGAT16-20 700358341/R.049540.019

ATTENTION TO: Cathy Martin

SAMPLING SITE: Long Cove, NL

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Cresols	ORG-91-5114	EPA SW846 3510C & 8270	GC/MS
Ortho-Cresol	ORG-91-5114	EPA SW846 3510C & 8270	GC/MS
Meta & Para-Cresol	ORG-91-5114	EPA SW846 3510C & 8270	GC/MS
Benzo(a)pyrene	ORG-91-5114	EPA SW846 3510C & 8270	GC/MS
Pentachlorophenol	ORG-91-5114	EPA SW846 3510C & 8270	GC/MS
Chrysene-d12	ORG-91-5114	EPA SW846 3510C & 8270	GC/MS

Appendix E
Sediment Sampling Results

Your P.O. #: CALLUP #96
Your Project #: 721329/3084
Site Location: LONG COVE
Your C.O.C. #: D 05948

Attention: Cathy Martin

Public Works & Government Services Canada
PO Box 4600
10 Barter's Hill
St. John's, NL
A1C 5T2

Report Date: 2016/03/28
Report #: R3943923
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B651625

Received: 2016/03/15, 10:21

Sample Matrix: Soil
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Free (WAD) Cyanide (1)	5	2016/03/21	2016/03/22	CAM SOP-00457	OMOE E3015 m
TEH in Soil (PIRI) (2, 3)	5	2016/03/22	2016/03/22	ATL SOP 00111	Atl. RBCA v3 m
Metals Solids Acid Extr. ICPMS (2)	1	2016/03/18	2016/03/18	ATL SOP 00058	EPA 6020A R1 m
Metals Solids Acid Extr. ICPMS (2)	2	2016/03/21	2016/03/22	ATL SOP 00058	EPA 6020A R1 m
Metals Solids Acid Extr. ICPMS (2)	2	2016/03/22	2016/03/22	ATL SOP 00058	EPA 6020A R1 m
Moisture (2)	5	N/A	2016/03/17	ATL SOP 00001	OMOE Handbook 1983 m
PAH in sediment by GC/MS (Low Level) (2, 3)	5	2016/03/22	2016/03/25	ATL SOP 00102	EPA 8270D 2007 m
Low Level PCB in Soil by GC-ECD (2)	5	2016/03/21	2016/03/22	ATL SOP 00106	EPA 8082A m
PCB Aroclor sum (low level soil) (2)	5	N/A	2016/03/22		Auto Calc.
pH (5:1 DI Water Extract) (2)	3	2016/03/18	2016/03/21	ATL SOP 00003	SM 22 4500-H+ B m
pH (5:1 DI Water Extract) (2)	2	2016/03/22	2016/03/22	ATL SOP 00003	SM 22 4500-H+ B m
VPH in Soil (PIRI) (2)	1	2016/03/15	2016/03/18	ATL SOP 00119	Atl. RBCA v3 m
VPH in Soil (PIRI) (2)	4	2016/03/16	2016/03/18	ATL SOP 00119	Atl. RBCA v3 m
ModTPH (T1) Calc. for Soil (2)	1	N/A	2016/03/18	N/A	Atl. RBCA v3 m
ModTPH (T1) Calc. for Soil (2)	4	N/A	2016/03/21	N/A	Atl. RBCA v3 m

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 Maxxam Analytics Mississauga

(2) This test was performed by Maxxam Bedford

(3) Soils are reported on a dry weight basis unless otherwise specified.

Your P.O. #: CALLUP #96
Your Project #: 721329/3084
Site Location: LONG COVE
Your C.O.C. #: D 05948

Attention: Cathy Martin

Public Works & Government Services Canada
PO Box 4600
10 Barter's Hill
St. John's, NL
A1C 5T2

Report Date: 2016/03/28
Report #: R3943923
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B651625

Received: 2016/03/15, 10:21

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Heather Macumber, Project Manager

Email: HMacumber@maxxam.ca

Phone# (902)420-0203 Ext:226

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This report has been generated and distributed using a secure automated process.

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B651625
Report Date: 2016/03/28

Public Works & Government Services Canada
Client Project #: 721329/3084
Site Location: LONG COVE
Your P.O. #: CALLUP #96

RBCA HYDROCARBONS IN SOIL (SOIL)

Maxxam ID		CAE411		CAE412	CAE413	CAE414		
Sampling Date		2016/03/09 15:00		2016/03/08 16:00	2016/03/09 16:00	2016/03/10 16:00		
COC Number		D 05948		D 05948	D 05948	D 05948		
	UNITS	BH1-MS1-0-0.40Z	QC Batch	BH2-MS1-OB	BH3-MS1-0-1.0Z	BH4-MS1-OB	RDL	QC Batch
Petroleum Hydrocarbons								
Benzene	mg/kg	ND	4421576	ND	ND	ND	0.025	4423779
Toluene	mg/kg	ND	4421576	ND	ND	ND	0.025	4423779
Ethylbenzene	mg/kg	ND	4421576	ND	ND	ND	0.025	4423779
Total Xylenes	mg/kg	ND	4421576	ND	0.079	ND	0.050	4423779
C6 - C10 (less BTEX)	mg/kg	ND	4421576	ND	ND	ND	2.5	4423779
>C10-C16 Hydrocarbons	mg/kg	ND	4427007	ND	ND	ND	10	4427007
>C16-C21 Hydrocarbons	mg/kg	ND	4427007	16	37	ND	10	4427007
>C21-<C32 Hydrocarbons	mg/kg	ND	4427007	66	120	ND	15	4427007
Modified TPH (Tier1)	mg/kg	ND	4417932	82	160	ND	15	4417932
Reached Baseline at C32	mg/kg	NA	4427007	Yes	Yes	NA	N/A	4427007
Hydrocarbon Resemblance	mg/kg	NA	4427007	COMMENT (1)	COMMENT (2)	NA	N/A	4427007
Surrogate Recovery (%)								
Isobutylbenzene - Extractable	%	95	4427007	103	91	98		4427007
n-Dotriacontane - Extractable	%	90	4427007	101	92	86		4427007
Isobutylbenzene - Volatile	%	104	4421576	93	97	89		4423779
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not detected N/A = Not Applicable (1) Lube oil fraction. (2) Lube oil fraction. Unidentified compound(s) in fuel / lube range.								

Maxxam Job #: B651625
Report Date: 2016/03/28

Public Works & Government Services Canada
Client Project #: 721329/3084
Site Location: LONG COVE
Your P.O. #: CALLUP #96

RBCA HYDROCARBONS IN SOIL (SOIL)

Maxxam ID		CAE415		
Sampling Date		2016/03/10 16:00		
COC Number		D 05948		
	UNITS	BH4-MS2-0.15-1.0Z	RDL	QC Batch
Petroleum Hydrocarbons				
Benzene	mg/kg	ND	0.025	4423779
Toluene	mg/kg	ND	0.025	4423779
Ethylbenzene	mg/kg	ND	0.025	4423779
Total Xylenes	mg/kg	ND	0.050	4423779
C6 - C10 (less BTEX)	mg/kg	ND	2.5	4423779
>C10-C16 Hydrocarbons	mg/kg	ND	10	4427007
>C16-C21 Hydrocarbons	mg/kg	ND	10	4427007
>C21-<C32 Hydrocarbons	mg/kg	ND	15	4427007
Modified TPH (Tier1)	mg/kg	ND	15	4417932
Reached Baseline at C32	mg/kg	NA	N/A	4427007
Hydrocarbon Resemblance	mg/kg	NA	N/A	4427007
Surrogate Recovery (%)				
Isobutylbenzene - Extractable	%	95		4427007
n-Dotriacontane - Extractable	%	91		4427007
Isobutylbenzene - Volatile	%	95		4423779
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not detected N/A = Not Applicable				

Maxxam Job #: B651625
Report Date: 2016/03/28

Public Works & Government Services Canada
Client Project #: 721329/3084
Site Location: LONG COVE
Your P.O. #: CALLUP #96

RESULTS OF ANALYSES OF SOIL

Maxxam ID		CAE411	CAE412		CAE413	CAE414	CAE415		
Sampling Date		2016/03/09 15:00	2016/03/08 16:00		2016/03/09 16:00	2016/03/10 16:00	2016/03/10 16:00		
COC Number		D 05948	D 05948		D 05948	D 05948	D 05948		
	UNITS	BH1-MS1-0-0.40Z	BH2-MS1-OB	QC Batch	BH3-MS1-0-1.0Z	BH4-MS1-OB	BH4-MS2-0.15-1.0Z	RDL	QC Batch

Inorganics									
Free Cyanide	ug/g	ND	0.02	4426155	0.02	0.09	0.05	0.01	4426155
Moisture	%	22	34	4419319	51	82	74	1.0	4419319
Soluble (5:1) pH	pH	7.42	8.16	4427539	7.54	7.07	7.26	N/A	4425975

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

ND = Not detected

N/A = Not Applicable

Maxxam Job #: B651625
Report Date: 2016/03/28

Public Works & Government Services Canada
Client Project #: 721329/3084
Site Location: LONG COVE
Your P.O. #: CALLUP #96

PCB'S AND DDT BY GC-ECD (SOIL)

Maxxam ID		CAE411	CAE412		CAE413	CAE413		CAE414		
Sampling Date		2016/03/09 15:00	2016/03/08 16:00		2016/03/09 16:00	2016/03/09 16:00		2016/03/10 16:00		
COC Number		D 05948	D 05948		D 05948	D 05948		D 05948		
	UNITS	BH1-MS1-0-0.40Z	BH2-MS1-OB	RDL	BH3-MS1-0-1.0Z	BH3-MS1-0-1.0Z Lab-Dup	RDL	BH4-MS1-OB	RDL	QC Batch

PCBs										
Aroclor 1016	mg/kg	ND	ND	0.010	ND	ND	0.030	ND	0.010	4425465
Aroclor 1221	mg/kg	ND	ND	0.010	ND	ND	0.030	ND	0.010	4425465
Aroclor 1232	mg/kg	ND	ND	0.010	ND	ND	0.030	ND	0.010	4425465
Aroclor 1248	mg/kg	ND	ND	0.010	ND	ND	0.030	ND	0.010	4425465
Aroclor 1242	mg/kg	ND	ND	0.010	ND	ND	0.030	ND	0.010	4425465
Aroclor 1254	mg/kg	ND	ND	0.010	ND	ND	0.030	ND	0.010	4425465
Aroclor 1260	mg/kg	ND	ND	0.010	ND	ND	0.030	ND	0.010	4425465
Calculated Total PCB	mg/kg	ND	ND	0.010	ND		0.030	ND	0.010	4417940

Surrogate Recovery (%)

Decachlorobiphenyl	%	108 (1)	98		89 (2)	98 (2)		102 (1)		4425465
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RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Lab-Dup = Laboratory Initiated Duplicate

ND = Not detected

(1) PCB:Unidentified (possibly halogenated) compounds detected.

(2) Elevated PCB RDL due to matrix / co-extractive interference. PCB:Unidentified (possibly halogenated) compounds detected.

Maxxam ID		CAE415		
Sampling Date		2016/03/10 16:00		
COC Number		D 05948		
	UNITS	BH4-MS2-0.15-1.0Z	RDL	QC Batch

PCBs				
Aroclor 1016	mg/kg	ND	0.010	4425465
Aroclor 1221	mg/kg	ND	0.010	4425465
Aroclor 1232	mg/kg	ND	0.010	4425465
Aroclor 1248	mg/kg	ND	0.010	4425465
Aroclor 1242	mg/kg	ND	0.010	4425465
Aroclor 1254	mg/kg	ND	0.010	4425465
Aroclor 1260	mg/kg	ND	0.010	4425465
Calculated Total PCB	mg/kg	ND	0.010	4417940

Surrogate Recovery (%)

Decachlorobiphenyl	%	102		4425465
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RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

ND = Not detected

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		CAE411	CAE412		CAE413		CAE414		
Sampling Date		2016/03/09 15:00	2016/03/08 16:00		2016/03/09 16:00		2016/03/10 16:00		
COC Number		D 05948	D 05948		D 05948		D 05948		
	UNITS	BH1-MS1-0-0.40Z	BH2-MS1-OB	QC Batch	BH3-MS1-0-1.0Z	QC Batch	BH4-MS1-OB	RDL	QC Batch
Metals									
Acid Extractable Aluminum (Al)	mg/kg	16000	10000	4426952	11000	4425635	17000	10	4423055
Acid Extractable Antimony (Sb)	mg/kg	ND	ND	4426952	ND	4425635	ND	2.0	4423055
Acid Extractable Arsenic (As)	mg/kg	24	11	4426952	11	4425635	12	2.0	4423055
Acid Extractable Barium (Ba)	mg/kg	150	170	4426952	230	4425635	53	5.0	4423055
Acid Extractable Beryllium (Be)	mg/kg	ND	ND	4426952	ND	4425635	ND	2.0	4423055
Acid Extractable Boron (B)	mg/kg	ND	ND	4426952	ND	4425635	52	50	4423055
Acid Extractable Cadmium (Cd)	mg/kg	ND	0.44	4426952	0.60	4425635	0.53	0.30	4423055
Acid Extractable Chromium (Cr)	mg/kg	30	26	4426952	25	4425635	31	2.0	4423055
Acid Extractable Cobalt (Co)	mg/kg	22	12	4426952	11	4425635	13	1.0	4423055
Acid Extractable Copper (Cu)	mg/kg	64	49	4426952	55	4425635	22	2.0	4423055
Acid Extractable Iron (Fe)	mg/kg	36000	25000	4426952	23000	4425635	24000	50	4423055
Acid Extractable Lead (Pb)	mg/kg	22	30	4426952	28	4425635	12	0.50	4423055
Acid Extractable Manganese (Mn)	mg/kg	960	750	4426952	550	4425635	840	2.0	4423055
Acid Extractable Mercury (Hg)	mg/kg	ND	ND	4426952	0.10	4425635	ND	0.10	4423055
Acid Extractable Molybdenum (Mo)	mg/kg	ND	6.2	4426952	8.9	4425635	8.3	2.0	4423055
Acid Extractable Nickel (Ni)	mg/kg	34	24	4426952	22	4425635	26	2.0	4423055
Acid Extractable Selenium (Se)	mg/kg	ND	ND	4426952	ND	4425635	1.3	1.0	4423055
Acid Extractable Silver (Ag)	mg/kg	ND	ND	4426952	ND	4425635	ND	0.50	4423055
Acid Extractable Strontium (Sr)	mg/kg	20	64	4426952	210	4425635	79	5.0	4423055
Acid Extractable Thallium (Tl)	mg/kg	ND	0.10	4426952	0.17	4425635	ND	0.10	4423055
Acid Extractable Tin (Sn)	mg/kg	ND	ND	4426952	3.3	4425635	ND	2.0	4423055
Acid Extractable Uranium (U)	mg/kg	14	2.2	4426952	2.4	4425635	4.2	0.10	4423055
Acid Extractable Vanadium (V)	mg/kg	35	26	4426952	31	4425635	31	2.0	4423055
Acid Extractable Zinc (Zn)	mg/kg	110	160	4426952	110	4425635	79	5.0	4423055
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
ND = Not detected									

Maxxam Job #: B651625
Report Date: 2016/03/28

Public Works & Government Services Canada
Client Project #: 721329/3084
Site Location: LONG COVE
Your P.O. #: CALLUP #96

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		CAE414		CAE415		
Sampling Date		2016/03/10 16:00		2016/03/10 16:00		
COC Number		D 05948		D 05948		
	UNITS	BH4-MS1-OB Lab-Dup	QC Batch	BH4-MS2-0.15-1.0Z	RDL	QC Batch
Metals						
Acid Extractable Aluminum (Al)	mg/kg	16000	4423055	15000	10	4425635
Acid Extractable Antimony (Sb)	mg/kg	ND	4423055	ND	2.0	4425635
Acid Extractable Arsenic (As)	mg/kg	11	4423055	12	2.0	4425635
Acid Extractable Barium (Ba)	mg/kg	47	4423055	120	5.0	4425635
Acid Extractable Beryllium (Be)	mg/kg	ND	4423055	ND	2.0	4425635
Acid Extractable Boron (B)	mg/kg	ND	4423055	ND	50	4425635
Acid Extractable Cadmium (Cd)	mg/kg	0.48	4423055	0.52	0.30	4425635
Acid Extractable Chromium (Cr)	mg/kg	29	4423055	23	2.0	4425635
Acid Extractable Cobalt (Co)	mg/kg	12	4423055	7.8	1.0	4425635
Acid Extractable Copper (Cu)	mg/kg	21	4423055	63	2.0	4425635
Acid Extractable Iron (Fe)	mg/kg	23000	4423055	11000	50	4425635
Acid Extractable Lead (Pb)	mg/kg	11	4423055	6.5	0.50	4425635
Acid Extractable Manganese (Mn)	mg/kg	810	4423055	350	2.0	4425635
Acid Extractable Mercury (Hg)	mg/kg	ND	4423055	ND	0.10	4425635
Acid Extractable Molybdenum (Mo)	mg/kg	7.8	4423055	2.7	2.0	4425635
Acid Extractable Nickel (Ni)	mg/kg	25	4423055	22	2.0	4425635
Acid Extractable Selenium (Se)	mg/kg	1.0	4423055	1.3	1.0	4425635
Acid Extractable Silver (Ag)	mg/kg	ND	4423055	ND	0.50	4425635
Acid Extractable Strontium (Sr)	mg/kg	73	4423055	68	5.0	4425635
Acid Extractable Thallium (Tl)	mg/kg	ND	4423055	ND	0.10	4425635
Acid Extractable Tin (Sn)	mg/kg	ND	4423055	ND	2.0	4425635
Acid Extractable Uranium (U)	mg/kg	4.2	4423055	1.3	0.10	4425635
Acid Extractable Vanadium (V)	mg/kg	30	4423055	18	2.0	4425635
Acid Extractable Zinc (Zn)	mg/kg	78	4423055	110	5.0	4425635
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate ND = Not detected						

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		CAE411	CAE412	CAE413		CAE413		
Sampling Date		2016/03/09 15:00	2016/03/08 16:00	2016/03/09 16:00		2016/03/09 16:00		
COC Number		D 05948	D 05948	D 05948		D 05948		
	UNITS	BH1-MS1-0-0.40Z	BH2-MS1-0B	BH3-MS1-0-1.0Z	RDL	BH3-MS1-0-1.0Z Lab-Dup	RDL	QC Batch
Polyaromatic Hydrocarbons								
1-Methylnaphthalene	mg/kg	ND	ND	ND	0.0050	ND	0.0050	4426951
2-Methylnaphthalene	mg/kg	ND	ND	ND	0.0050	ND	0.0050	4426951
Acenaphthene	mg/kg	ND	0.017	ND	0.0050	0.017	0.0050	4426951
Acenaphthylene	mg/kg	ND	0.012	0.064	0.0050	0.24 (1)	0.0050	4426951
Anthracene	mg/kg	0.0070	0.18	0.64	0.0050	1.3 (1)	0.0050	4426951
Benzo(a)anthracene	mg/kg	0.024	0.20	6.1	0.0050	12 (2)	0.025	4426951
Benzo(a)pyrene	mg/kg	0.017	0.20	2.3	0.0050	6.1 (1)	0.0050	4426951
Benzo(b)fluoranthene	mg/kg	0.028	0.25	2.9	0.0050	8.2 (1)	0.0050	4426951
Benzo(g,h,i)perylene	mg/kg	0.011	0.11	0.56	0.0050	1.5 (1)	0.0050	4426951
Benzo(j)fluoranthene	mg/kg	0.013	0.14	1.5	0.0050	4.5 (1)	0.0050	4426951
Benzo(k)fluoranthene	mg/kg	0.016	0.14	1.9	0.0050	4.7 (1)	0.0050	4426951
Chrysene	mg/kg	0.030	0.34	4.9	0.0050	8.4 (2)	0.025	4426951
Dibenz(a,h)anthracene	mg/kg	ND	0.034	0.26	0.0050	0.65 (1)	0.0050	4426951
Fluoranthene	mg/kg	0.075	0.70	8.6	0.0050	26 (2)	0.025	4426951
Fluorene	mg/kg	ND	0.043	0.079	0.0050	0.18 (1)	0.0050	4426951
Indeno(1,2,3-cd)pyrene	mg/kg	0.0093	0.12	0.69	0.0050	1.8 (1)	0.0050	4426951
Naphthalene	mg/kg	ND	ND	ND	0.0050	ND	0.0050	4426951
Perylene	mg/kg	0.025	0.073	0.62	0.0050	1.6 (1)	0.0050	4426951
Phenanthrene	mg/kg	0.0071	0.28	0.54	0.0050	1.2 (1)	0.0050	4426951
Pyrene	mg/kg	0.039	0.36	4.7	0.0050	9.0 (1)	0.0050	4426951
Surrogate Recovery (%)								
D10-Anthracene	%	77	94	88		92		4426951
D14-Terphenyl	%	77	91	88		85		4426951
D8-Acenaphthylene	%	82	84	77		79		4426951
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate ND = Not detected (1) Duplicate: results are outside acceptance limit. Sample was past recommended hold time for repeat analysis. (2) Duplicate: results are outside acceptance limit. Sample was past recommended hold time for repeat analysis. Elevated PAH RDL(s) due to sample dilution.								

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		CAE414	CAE415		
Sampling Date		2016/03/10 16:00	2016/03/10 16:00		
COC Number		D 05948	D 05948		
	UNITS	BH4-MS1-OB	BH4-MS2-0.15-1.OZ	RDL	QC Batch
Polyaromatic Hydrocarbons					
1-Methylnaphthalene	mg/kg	ND	ND	0.0050	4426951
2-Methylnaphthalene	mg/kg	ND	ND	0.0050	4426951
Acenaphthene	mg/kg	ND	ND	0.0050	4426951
Acenaphthylene	mg/kg	ND	ND	0.0050	4426951
Anthracene	mg/kg	0.066	ND	0.0050	4426951
Benzo(a)anthracene	mg/kg	0.32	ND	0.0050	4426951
Benzo(a)pyrene	mg/kg	0.17	ND	0.0050	4426951
Benzo(b)fluoranthene	mg/kg	0.23	ND	0.0050	4426951
Benzo(g,h,i)perylene	mg/kg	0.078	ND	0.0050	4426951
Benzo(j)fluoranthene	mg/kg	0.15	ND	0.0050	4426951
Benzo(k)fluoranthene	mg/kg	0.13	ND	0.0050	4426951
Chrysene	mg/kg	0.34	0.025	0.0050	4426951
Dibenz(a,h)anthracene	mg/kg	ND	ND	0.0050	4426951
Fluoranthene	mg/kg	0.95	0.064	0.0050	4426951
Fluorene	mg/kg	ND	ND	0.0050	4426951
Indeno(1,2,3-cd)pyrene	mg/kg	0.076	ND	0.0050	4426951
Naphthalene	mg/kg	ND	ND	0.0050	4426951
Perylene	mg/kg	0.22	0.19	0.0050	4426951
Phenanthrene	mg/kg	0.057	ND	0.0050	4426951
Pyrene	mg/kg	0.47	0.028	0.0050	4426951
Surrogate Recovery (%)					
D10-Anthracene	%	86	80		4426951
D14-Terphenyl	%	93	91		4426951
D8-Acenaphthylene	%	79	74		4426951
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
ND = Not detected					

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	6.3°C
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TEH Analysis: Silica gel clean-up performed prior to analysis as per client request.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4421576	MS3	Matrix Spike	Isobutylbenzene - Volatile	2016/03/17		90	%	60 - 130
			Benzene	2016/03/17		95	%	60 - 130
			Toluene	2016/03/17		96	%	60 - 130
			Ethylbenzene	2016/03/17		97	%	60 - 130
			Total Xylenes	2016/03/17		97	%	60 - 130
4421576	MS3	Spiked Blank	Isobutylbenzene - Volatile	2016/03/17		98	%	60 - 130
			Benzene	2016/03/17		98	%	60 - 140
			Toluene	2016/03/17		99	%	60 - 140
			Ethylbenzene	2016/03/17		102	%	60 - 140
			Total Xylenes	2016/03/17		101	%	60 - 140
4421576	MS3	Method Blank	Isobutylbenzene - Volatile	2016/03/17		100	%	60 - 130
			Benzene	2016/03/17	ND, RDL=0.025		mg/kg	
			Toluene	2016/03/17	ND, RDL=0.025		mg/kg	
			Ethylbenzene	2016/03/17	ND, RDL=0.025		mg/kg	
			Total Xylenes	2016/03/17	ND, RDL=0.050		mg/kg	
			C6 - C10 (less BTEX)	2016/03/17	ND, RDL=2.5		mg/kg	
4421576	MS3	RPD	Benzene	2016/03/17	NC		%	50
			Toluene	2016/03/17	NC		%	50
			Ethylbenzene	2016/03/17	NC		%	50
			Total Xylenes	2016/03/17	NC		%	50
			C6 - C10 (less BTEX)	2016/03/17	NC		%	50
4423055	BAN	Matrix Spike [CAE414-02]	Acid Extractable Antimony (Sb)	2016/03/18		74 (1)	%	75 - 125
			Acid Extractable Arsenic (As)	2016/03/18		92	%	75 - 125
			Acid Extractable Barium (Ba)	2016/03/18		NC	%	75 - 125
			Acid Extractable Beryllium (Be)	2016/03/18		94	%	75 - 125
			Acid Extractable Boron (B)	2016/03/18		NC	%	75 - 125
			Acid Extractable Cadmium (Cd)	2016/03/18		92	%	75 - 125
			Acid Extractable Chromium (Cr)	2016/03/18		NC	%	75 - 125
			Acid Extractable Cobalt (Co)	2016/03/18		88	%	75 - 125
			Acid Extractable Copper (Cu)	2016/03/18		90	%	75 - 125
			Acid Extractable Lead (Pb)	2016/03/18		90	%	75 - 125
			Acid Extractable Manganese (Mn)	2016/03/18		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2016/03/18		87	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2016/03/18		NC	%	75 - 125
			Acid Extractable Nickel (Ni)	2016/03/18		NC	%	75 - 125
			Acid Extractable Selenium (Se)	2016/03/18		89	%	75 - 125
			Acid Extractable Silver (Ag)	2016/03/18		93	%	75 - 125
			Acid Extractable Strontium (Sr)	2016/03/18		NC	%	75 - 125
			Acid Extractable Thallium (Tl)	2016/03/18		95	%	75 - 125
			Acid Extractable Tin (Sn)	2016/03/18		92	%	75 - 125
			Acid Extractable Uranium (U)	2016/03/18		94	%	75 - 125
			Acid Extractable Vanadium (V)	2016/03/18		NC	%	75 - 125
			Acid Extractable Zinc (Zn)	2016/03/18		NC	%	75 - 125
4423055	BAN	Spiked Blank	Acid Extractable Antimony (Sb)	2016/03/18		99	%	75 - 125
			Acid Extractable Arsenic (As)	2016/03/18		99	%	75 - 125
			Acid Extractable Barium (Ba)	2016/03/18		96	%	75 - 125
			Acid Extractable Beryllium (Be)	2016/03/18		98	%	75 - 125

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4423055	BAN	Method Blank	Acid Extractable Boron (B)	2016/03/18		101	%	75 - 125
			Acid Extractable Cadmium (Cd)	2016/03/18		99	%	75 - 125
			Acid Extractable Chromium (Cr)	2016/03/18		97	%	75 - 125
			Acid Extractable Cobalt (Co)	2016/03/18		96	%	75 - 125
			Acid Extractable Copper (Cu)	2016/03/18		96	%	75 - 125
			Acid Extractable Lead (Pb)	2016/03/18		97	%	75 - 125
			Acid Extractable Manganese (Mn)	2016/03/18		98	%	75 - 125
			Acid Extractable Mercury (Hg)	2016/03/18		106	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2016/03/18		100	%	75 - 125
			Acid Extractable Nickel (Ni)	2016/03/18		97	%	75 - 125
			Acid Extractable Selenium (Se)	2016/03/18		100	%	75 - 125
			Acid Extractable Silver (Ag)	2016/03/18		98	%	75 - 125
			Acid Extractable Strontium (Sr)	2016/03/18		100	%	75 - 125
			Acid Extractable Thallium (Tl)	2016/03/18		100	%	75 - 125
			Acid Extractable Tin (Sn)	2016/03/18		100	%	75 - 125
			Acid Extractable Uranium (U)	2016/03/18		100	%	75 - 125
			Acid Extractable Vanadium (V)	2016/03/18		98	%	75 - 125
			Acid Extractable Zinc (Zn)	2016/03/18		98	%	75 - 125
			Acid Extractable Aluminum (Al)	2016/03/18	ND, RDL=10		mg/kg	
			Acid Extractable Antimony (Sb)	2016/03/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Arsenic (As)	2016/03/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Barium (Ba)	2016/03/18	ND, RDL=5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2016/03/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Boron (B)	2016/03/18	ND, RDL=50		mg/kg	
			Acid Extractable Cadmium (Cd)	2016/03/18	ND, RDL=0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2016/03/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2016/03/18	ND, RDL=1.0		mg/kg	
			Acid Extractable Copper (Cu)	2016/03/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Iron (Fe)	2016/03/18	ND, RDL=50		mg/kg	
			Acid Extractable Lead (Pb)	2016/03/18	ND, RDL=0.50		mg/kg	
			Acid Extractable Manganese (Mn)	2016/03/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2016/03/18	ND, RDL=0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2016/03/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2016/03/18	ND, RDL=2.0		mg/kg	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acid Extractable Selenium (Se)	2016/03/18	ND, RDL=1.0		mg/kg	
			Acid Extractable Silver (Ag)	2016/03/18	ND, RDL=0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2016/03/18	ND, RDL=5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2016/03/18	ND, RDL=0.10		mg/kg	
			Acid Extractable Tin (Sn)	2016/03/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Uranium (U)	2016/03/18	ND, RDL=0.10		mg/kg	
			Acid Extractable Vanadium (V)	2016/03/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2016/03/18	ND, RDL=5.0		mg/kg	
4423055	BAN	RPD [CAE414-02]	Acid Extractable Aluminum (Al)	2016/03/18	4.6		%	35
			Acid Extractable Antimony (Sb)	2016/03/18	NC		%	35
			Acid Extractable Arsenic (As)	2016/03/18	7.0		%	35
			Acid Extractable Barium (Ba)	2016/03/18	11		%	35
			Acid Extractable Beryllium (Be)	2016/03/18	NC		%	35
			Acid Extractable Boron (B)	2016/03/18	NC		%	35
			Acid Extractable Cadmium (Cd)	2016/03/18	NC		%	35
			Acid Extractable Chromium (Cr)	2016/03/18	6.2		%	35
			Acid Extractable Cobalt (Co)	2016/03/18	5.3		%	35
			Acid Extractable Copper (Cu)	2016/03/18	1.6		%	35
			Acid Extractable Iron (Fe)	2016/03/18	4.0		%	35
			Acid Extractable Lead (Pb)	2016/03/18	8.0		%	35
			Acid Extractable Manganese (Mn)	2016/03/18	3.2		%	35
			Acid Extractable Mercury (Hg)	2016/03/18	NC		%	35
			Acid Extractable Molybdenum (Mo)	2016/03/18	NC		%	35
			Acid Extractable Nickel (Ni)	2016/03/18	4.8		%	35
			Acid Extractable Selenium (Se)	2016/03/18	NC		%	35
			Acid Extractable Silver (Ag)	2016/03/18	NC		%	35
			Acid Extractable Strontium (Sr)	2016/03/18	7.5		%	35
			Acid Extractable Thallium (Tl)	2016/03/18	NC		%	35
			Acid Extractable Tin (Sn)	2016/03/18	NC		%	35
			Acid Extractable Uranium (U)	2016/03/18	2.0		%	35
			Acid Extractable Vanadium (V)	2016/03/18	3.5		%	35
			Acid Extractable Zinc (Zn)	2016/03/18	0.29		%	35
4423779	MS3	Matrix Spike	Isobutylbenzene - Volatile	2016/03/18		104	%	60 - 130
			Benzene	2016/03/18		101	%	60 - 130
			Toluene	2016/03/18		103	%	60 - 130
			Ethylbenzene	2016/03/18		105	%	60 - 130
			Total Xylenes	2016/03/18		105	%	60 - 130
4423779	MS3	Spiked Blank	Isobutylbenzene - Volatile	2016/03/18		98	%	60 - 130
			Benzene	2016/03/18		98	%	60 - 140
			Toluene	2016/03/18		99	%	60 - 140
			Ethylbenzene	2016/03/18		101	%	60 - 140
			Total Xylenes	2016/03/18		101	%	60 - 140
4423779	MS3	Method Blank	Isobutylbenzene - Volatile	2016/03/18		102	%	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
			Benzene	2016/03/18	ND, RDL=0.025		mg/kg	
			Toluene	2016/03/18	ND, RDL=0.025		mg/kg	
			Ethylbenzene	2016/03/18	ND, RDL=0.025		mg/kg	
			Total Xylenes	2016/03/18	ND, RDL=0.050		mg/kg	
			C6 - C10 (less BTEX)	2016/03/18	ND, RDL=2.5		mg/kg	
4423779	MS3	RPD	Benzene	2016/03/18	NC		%	50
			Toluene	2016/03/18	NC		%	50
			Ethylbenzene	2016/03/18	NC		%	50
			Total Xylenes	2016/03/18	NC		%	50
			C6 - C10 (less BTEX)	2016/03/18	NC		%	50
4425465	LGE	Matrix Spike [CAE413-02]	Decachlorobiphenyl	2016/03/22		99	%	70 - 130
			Aroclor 1254	2016/03/22		97	%	30 - 130
4425465	LGE	Spiked Blank	Decachlorobiphenyl	2016/03/22		112	%	70 - 130
			Aroclor 1254	2016/03/22		110	%	30 - 130
4425465	LGE	Method Blank	Decachlorobiphenyl	2016/03/22		103	%	70 - 130
			Aroclor 1016	2016/03/22	ND, RDL=0.010		mg/kg	
			Aroclor 1221	2016/03/22	ND, RDL=0.010		mg/kg	
			Aroclor 1232	2016/03/22	ND, RDL=0.010		mg/kg	
			Aroclor 1248	2016/03/22	ND, RDL=0.010		mg/kg	
			Aroclor 1242	2016/03/22	ND, RDL=0.010		mg/kg	
			Aroclor 1254	2016/03/22	ND, RDL=0.010		mg/kg	
			Aroclor 1260	2016/03/22	ND, RDL=0.010		mg/kg	
4425465	LGE	RPD [CAE413-02]	Aroclor 1016	2016/03/22	NC		%	50
			Aroclor 1221	2016/03/22	NC		%	50
			Aroclor 1232	2016/03/22	NC		%	50
			Aroclor 1248	2016/03/22	NC		%	50
			Aroclor 1242	2016/03/22	NC		%	50
			Aroclor 1254	2016/03/22	NC		%	50
			Aroclor 1260	2016/03/22	NC		%	50
4425635	BAN	Matrix Spike	Acid Extractable Antimony (Sb)	2016/03/22		89	%	75 - 125
			Acid Extractable Arsenic (As)	2016/03/22		94	%	75 - 125
			Acid Extractable Barium (Ba)	2016/03/22		NC	%	75 - 125
			Acid Extractable Beryllium (Be)	2016/03/22		92	%	75 - 125
			Acid Extractable Boron (B)	2016/03/22		86	%	75 - 125
			Acid Extractable Cadmium (Cd)	2016/03/22		95	%	75 - 125
			Acid Extractable Chromium (Cr)	2016/03/22		95	%	75 - 125
			Acid Extractable Cobalt (Co)	2016/03/22		95	%	75 - 125
			Acid Extractable Copper (Cu)	2016/03/22		96	%	75 - 125
			Acid Extractable Lead (Pb)	2016/03/22		92	%	75 - 125

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4425635	BAN	Spiked Blank		Acid Extractable Manganese (Mn)	2016/03/22		NC	%	75 - 125
				Acid Extractable Mercury (Hg)	2016/03/22		90	%	75 - 125
				Acid Extractable Molybdenum (Mo)	2016/03/22		95	%	75 - 125
				Acid Extractable Nickel (Ni)	2016/03/22		98	%	75 - 125
				Acid Extractable Selenium (Se)	2016/03/22		96	%	75 - 125
				Acid Extractable Silver (Ag)	2016/03/22		96	%	75 - 125
				Acid Extractable Strontium (Sr)	2016/03/22		98	%	75 - 125
				Acid Extractable Thallium (Tl)	2016/03/22		96	%	75 - 125
				Acid Extractable Tin (Sn)	2016/03/22		97	%	75 - 125
				Acid Extractable Uranium (U)	2016/03/22		96	%	75 - 125
				Acid Extractable Vanadium (V)	2016/03/22		93	%	75 - 125
				Acid Extractable Zinc (Zn)	2016/03/22		NC	%	75 - 125
				Acid Extractable Antimony (Sb)	2016/03/22		95	%	75 - 125
				Acid Extractable Arsenic (As)	2016/03/22		97	%	75 - 125
				Acid Extractable Barium (Ba)	2016/03/22		92	%	75 - 125
				Acid Extractable Beryllium (Be)	2016/03/22		89	%	75 - 125
				Acid Extractable Boron (B)	2016/03/22		86	%	75 - 125
				Acid Extractable Cadmium (Cd)	2016/03/22		96	%	75 - 125
				Acid Extractable Chromium (Cr)	2016/03/22		96	%	75 - 125
				Acid Extractable Cobalt (Co)	2016/03/22		96	%	75 - 125
				Acid Extractable Copper (Cu)	2016/03/22		96	%	75 - 125
				Acid Extractable Lead (Pb)	2016/03/22		94	%	75 - 125
				Acid Extractable Manganese (Mn)	2016/03/22		96	%	75 - 125
				Acid Extractable Mercury (Hg)	2016/03/22		97	%	75 - 125
				Acid Extractable Molybdenum (Mo)	2016/03/22		94	%	75 - 125
				Acid Extractable Nickel (Ni)	2016/03/22		97	%	75 - 125
				Acid Extractable Selenium (Se)	2016/03/22		97	%	75 - 125
				Acid Extractable Silver (Ag)	2016/03/22		97	%	75 - 125
				Acid Extractable Strontium (Sr)	2016/03/22		99	%	75 - 125
				Acid Extractable Thallium (Tl)	2016/03/22		96	%	75 - 125
				Acid Extractable Tin (Sn)	2016/03/22		96	%	75 - 125
				Acid Extractable Uranium (U)	2016/03/22		97	%	75 - 125
				Acid Extractable Vanadium (V)	2016/03/22		94	%	75 - 125
				Acid Extractable Zinc (Zn)	2016/03/22		98	%	75 - 125
4425635	BAN	Method Blank		Acid Extractable Aluminum (Al)	2016/03/22	ND, RDL=10		mg/kg	
				Acid Extractable Antimony (Sb)	2016/03/22	ND, RDL=2.0		mg/kg	
				Acid Extractable Arsenic (As)	2016/03/22	ND, RDL=2.0		mg/kg	
				Acid Extractable Barium (Ba)	2016/03/22	ND, RDL=5.0		mg/kg	
				Acid Extractable Beryllium (Be)	2016/03/22	ND, RDL=2.0		mg/kg	
				Acid Extractable Boron (B)	2016/03/22	ND, RDL=50		mg/kg	
				Acid Extractable Cadmium (Cd)	2016/03/22	ND, RDL=0.30		mg/kg	
				Acid Extractable Chromium (Cr)	2016/03/22	ND, RDL=2.0		mg/kg	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
				Acid Extractable Cobalt (Co)	2016/03/22	ND, RDL=1.0		mg/kg	
				Acid Extractable Copper (Cu)	2016/03/22	ND, RDL=2.0		mg/kg	
				Acid Extractable Iron (Fe)	2016/03/22	ND, RDL=50		mg/kg	
				Acid Extractable Lead (Pb)	2016/03/22	ND, RDL=0.50		mg/kg	
				Acid Extractable Manganese (Mn)	2016/03/22	ND, RDL=2.0		mg/kg	
				Acid Extractable Mercury (Hg)	2016/03/22	ND, RDL=0.10		mg/kg	
				Acid Extractable Molybdenum (Mo)	2016/03/22	ND, RDL=2.0		mg/kg	
				Acid Extractable Nickel (Ni)	2016/03/22	ND, RDL=2.0		mg/kg	
				Acid Extractable Selenium (Se)	2016/03/22	ND, RDL=1.0		mg/kg	
				Acid Extractable Silver (Ag)	2016/03/22	ND, RDL=0.50		mg/kg	
				Acid Extractable Strontium (Sr)	2016/03/22	ND, RDL=5.0		mg/kg	
				Acid Extractable Thallium (Tl)	2016/03/22	ND, RDL=0.10		mg/kg	
				Acid Extractable Tin (Sn)	2016/03/22	ND, RDL=2.0		mg/kg	
				Acid Extractable Uranium (U)	2016/03/22	ND, RDL=0.10		mg/kg	
				Acid Extractable Vanadium (V)	2016/03/22	ND, RDL=2.0		mg/kg	
				Acid Extractable Zinc (Zn)	2016/03/22	ND, RDL=5.0		mg/kg	
4425635	BAN	RPD		Acid Extractable Aluminum (Al)	2016/03/22	8.7		%	35
				Acid Extractable Antimony (Sb)	2016/03/22	NC		%	35
				Acid Extractable Arsenic (As)	2016/03/22	5.5		%	35
				Acid Extractable Barium (Ba)	2016/03/22	19		%	35
				Acid Extractable Beryllium (Be)	2016/03/22	NC		%	35
				Acid Extractable Boron (B)	2016/03/22	NC		%	35
				Acid Extractable Cadmium (Cd)	2016/03/22	NC		%	35
				Acid Extractable Chromium (Cr)	2016/03/22	6.8		%	35
				Acid Extractable Cobalt (Co)	2016/03/22	9.1		%	35
				Acid Extractable Copper (Cu)	2016/03/22	13		%	35
				Acid Extractable Iron (Fe)	2016/03/22	6.7		%	35
				Acid Extractable Lead (Pb)	2016/03/22	12		%	35
				Acid Extractable Manganese (Mn)	2016/03/22	18		%	35
				Acid Extractable Mercury (Hg)	2016/03/22	NC		%	35
				Acid Extractable Molybdenum (Mo)	2016/03/22	NC		%	35
				Acid Extractable Nickel (Ni)	2016/03/22	7.0		%	35
				Acid Extractable Selenium (Se)	2016/03/22	NC		%	35
				Acid Extractable Silver (Ag)	2016/03/22	NC		%	35

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QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
				Acid Extractable Strontium (Sr)	2016/03/22	NC		%	35
				Acid Extractable Thallium (Tl)	2016/03/22	NC		%	35
				Acid Extractable Tin (Sn)	2016/03/22	NC		%	35
				Acid Extractable Uranium (U)	2016/03/22	NC		%	35
				Acid Extractable Vanadium (V)	2016/03/22	13		%	35
				Acid Extractable Zinc (Zn)	2016/03/22	14		%	35
4426155	XQI	Matrix Spike		Free Cyanide	2016/03/22		95	%	75 - 125
4426155	XQI	Spiked Blank		Free Cyanide	2016/03/22		101	%	80 - 120
4426155	XQI	Method Blank		Free Cyanide	2016/03/22	ND, RDL=0.01		ug/g	
4426155	XQI	RPD		Free Cyanide	2016/03/22	NC		%	35
4426951	RST	Matrix Spike [CAE413-02]		D10-Anthracene	2016/03/25		89	%	30 - 130
				D14-Terphenyl	2016/03/25		81	%	30 - 130
				D8-Acenaphthylene	2016/03/25		78	%	30 - 130
				1-Methylnaphthalene	2016/03/25		87	%	30 - 130
				2-Methylnaphthalene	2016/03/25		97	%	30 - 130
				Acenaphthene	2016/03/25		99	%	30 - 130
				Acenaphthylene	2016/03/25		NC	%	30 - 130
				Anthracene	2016/03/25		NC	%	30 - 130
				Benzo(a)anthracene	2016/03/25		NC	%	30 - 130
				Benzo(a)pyrene	2016/03/25		NC	%	30 - 130
				Benzo(b)fluoranthene	2016/03/25		NC	%	30 - 130
				Benzo(g,h,i)perylene	2016/03/25		NC	%	30 - 130
				Benzo(j)fluoranthene	2016/03/25		NC	%	30 - 130
				Benzo(k)fluoranthene	2016/03/25		NC	%	30 - 130
				Chrysene	2016/03/25		NC	%	30 - 130
				Dibenz(a,h)anthracene	2016/03/25		NC	%	30 - 130
				Fluoranthene	2016/03/25		NC	%	30 - 130
				Fluorene	2016/03/25		NC	%	30 - 130
				Indeno(1,2,3-cd)pyrene	2016/03/25		NC	%	30 - 130
				Naphthalene	2016/03/25		92	%	30 - 130
				Perylene	2016/03/25		NC	%	30 - 130
				Phenanthrene	2016/03/25		NC	%	30 - 130
				Pyrene	2016/03/25		NC	%	30 - 130
4426951	RST	Spiked Blank		D10-Anthracene	2016/03/25		84	%	30 - 130
				D14-Terphenyl	2016/03/25		88	%	30 - 130
				D8-Acenaphthylene	2016/03/25		82	%	30 - 130
				1-Methylnaphthalene	2016/03/25		87	%	30 - 130
				2-Methylnaphthalene	2016/03/25		94	%	30 - 130
				Acenaphthene	2016/03/25		95	%	30 - 130
				Acenaphthylene	2016/03/25		101	%	30 - 130
				Anthracene	2016/03/25		110	%	30 - 130
				Benzo(a)anthracene	2016/03/25		104	%	30 - 130
				Benzo(a)pyrene	2016/03/25		87	%	30 - 130
				Benzo(b)fluoranthene	2016/03/25		87	%	30 - 130
				Benzo(g,h,i)perylene	2016/03/25		79	%	30 - 130
				Benzo(j)fluoranthene	2016/03/25		91	%	30 - 130
				Benzo(k)fluoranthene	2016/03/25		98	%	30 - 130
				Chrysene	2016/03/25		119	%	30 - 130
				Dibenz(a,h)anthracene	2016/03/25		69	%	30 - 130
				Fluoranthene	2016/03/25		115	%	30 - 130
				Fluorene	2016/03/25		104	%	30 - 130

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4426951	RST	Method Blank	Indeno(1,2,3-cd)pyrene	2016/03/25		71	%	30 - 130
			Naphthalene	2016/03/25		90	%	30 - 130
			Perylene	2016/03/25		88	%	30 - 130
			Phenanthrene	2016/03/25		113	%	30 - 130
			Pyrene	2016/03/25		108	%	30 - 130
			D10-Anthracene	2016/03/25		83	%	30 - 130
			D14-Terphenyl	2016/03/25		86	%	30 - 130
			D8-Acenaphthylene	2016/03/25		80	%	30 - 130
			1-Methylnaphthalene	2016/03/25	ND, RDL=0.0050		mg/kg	
			2-Methylnaphthalene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Acenaphthene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Acenaphthylene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Anthracene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Benzo(a)anthracene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Benzo(a)pyrene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Benzo(b)fluoranthene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Benzo(g,h,i)perylene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Benzo(j)fluoranthene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Benzo(k)fluoranthene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Chrysene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Dibenz(a,h)anthracene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Fluoranthene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Fluorene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Indeno(1,2,3-cd)pyrene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Naphthalene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Perylene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Phenanthrene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Pyrene	2016/03/25	ND, RDL=0.0050		mg/kg	
4426951	RST	RPD [CAE413-02]	1-Methylnaphthalene	2016/03/28	NC		%	50
			2-Methylnaphthalene	2016/03/28	NC		%	50

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
				Acenaphthene	2016/03/28	NC		%	50
				Acenaphthylene	2016/03/28	115 (2)		%	50
				Anthracene	2016/03/28	69 (2)		%	50
				Benzo(a)anthracene	2016/03/28	63 (3)		%	50
				Benzo(a)pyrene	2016/03/28	89 (2)		%	50
				Benzo(b)fluoranthene	2016/03/28	96 (2)		%	50
				Benzo(g,h,i)perylene	2016/03/28	90 (2)		%	50
				Benzo(j)fluoranthene	2016/03/28	97 (2)		%	50
				Benzo(k)fluoranthene	2016/03/28	87 (2)		%	50
				Chrysene	2016/03/28	53 (3)		%	50
				Dibenz(a,h)anthracene	2016/03/28	85 (2)		%	50
				Fluoranthene	2016/03/28	100 (3)		%	50
				Fluorene	2016/03/28	77 (2)		%	50
				Indeno(1,2,3-cd)pyrene	2016/03/28	88 (2)		%	50
				Naphthalene	2016/03/28	NC		%	50
				Perylene	2016/03/28	87 (2)		%	50
				Phenanthrene	2016/03/28	74 (2)		%	50
				Pyrene	2016/03/28	63 (2)		%	50
4426952	BAN		Matrix Spike	Acid Extractable Antimony (Sb)	2016/03/22		89	%	75 - 125
				Acid Extractable Arsenic (As)	2016/03/22		95	%	75 - 125
				Acid Extractable Barium (Ba)	2016/03/22		NC	%	75 - 125
				Acid Extractable Beryllium (Be)	2016/03/22		94	%	75 - 125
				Acid Extractable Boron (B)	2016/03/22		87	%	75 - 125
				Acid Extractable Cadmium (Cd)	2016/03/22		92	%	75 - 125
				Acid Extractable Chromium (Cr)	2016/03/22		NC	%	75 - 125
				Acid Extractable Cobalt (Co)	2016/03/22		96	%	75 - 125
				Acid Extractable Copper (Cu)	2016/03/22		94	%	75 - 125
				Acid Extractable Lead (Pb)	2016/03/22		92	%	75 - 125
				Acid Extractable Manganese (Mn)	2016/03/22		NC	%	75 - 125
				Acid Extractable Mercury (Hg)	2016/03/22		87	%	75 - 125
				Acid Extractable Molybdenum (Mo)	2016/03/22		96	%	75 - 125
				Acid Extractable Nickel (Ni)	2016/03/22		96	%	75 - 125
				Acid Extractable Selenium (Se)	2016/03/22		96	%	75 - 125
				Acid Extractable Silver (Ag)	2016/03/22		99	%	75 - 125
				Acid Extractable Strontium (Sr)	2016/03/22		101	%	75 - 125
				Acid Extractable Thallium (Tl)	2016/03/22		96	%	75 - 125
				Acid Extractable Tin (Sn)	2016/03/22		99	%	75 - 125
				Acid Extractable Uranium (U)	2016/03/22		97	%	75 - 125
				Acid Extractable Vanadium (V)	2016/03/22		95	%	75 - 125
				Acid Extractable Zinc (Zn)	2016/03/22		NC	%	75 - 125
4426952	BAN		Spiked Blank	Acid Extractable Antimony (Sb)	2016/03/22		99	%	75 - 125
				Acid Extractable Arsenic (As)	2016/03/22		99	%	75 - 125
				Acid Extractable Barium (Ba)	2016/03/22		95	%	75 - 125
				Acid Extractable Beryllium (Be)	2016/03/22		92	%	75 - 125
				Acid Extractable Boron (B)	2016/03/22		91	%	75 - 125
				Acid Extractable Cadmium (Cd)	2016/03/22		92	%	75 - 125
				Acid Extractable Chromium (Cr)	2016/03/22		96	%	75 - 125
				Acid Extractable Cobalt (Co)	2016/03/22		96	%	75 - 125
				Acid Extractable Copper (Cu)	2016/03/22		95	%	75 - 125
				Acid Extractable Lead (Pb)	2016/03/22		94	%	75 - 125
				Acid Extractable Manganese (Mn)	2016/03/22		97	%	75 - 125
				Acid Extractable Mercury (Hg)	2016/03/22		99	%	75 - 125

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4426952	BAN	Method Blank	Acid Extractable Molybdenum (Mo)	2016/03/22		101	%	75 - 125
			Acid Extractable Nickel (Ni)	2016/03/22		97	%	75 - 125
			Acid Extractable Selenium (Se)	2016/03/22		102	%	75 - 125
			Acid Extractable Silver (Ag)	2016/03/22		99	%	75 - 125
			Acid Extractable Strontium (Sr)	2016/03/22		100	%	75 - 125
			Acid Extractable Thallium (Tl)	2016/03/22		98	%	75 - 125
			Acid Extractable Tin (Sn)	2016/03/22		103	%	75 - 125
			Acid Extractable Uranium (U)	2016/03/22		101	%	75 - 125
			Acid Extractable Vanadium (V)	2016/03/22		99	%	75 - 125
			Acid Extractable Zinc (Zn)	2016/03/22		96	%	75 - 125
			Acid Extractable Aluminum (Al)	2016/03/22	ND, RDL=10		mg/kg	
			Acid Extractable Antimony (Sb)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Arsenic (As)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Barium (Ba)	2016/03/22	ND, RDL=5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Boron (B)	2016/03/22	ND, RDL=50		mg/kg	
			Acid Extractable Cadmium (Cd)	2016/03/22	ND, RDL=0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2016/03/22	ND, RDL=1.0		mg/kg	
			Acid Extractable Copper (Cu)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Iron (Fe)	2016/03/22	ND, RDL=50		mg/kg	
			Acid Extractable Lead (Pb)	2016/03/22	ND, RDL=0.50		mg/kg	
			Acid Extractable Manganese (Mn)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2016/03/22	ND, RDL=0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Selenium (Se)	2016/03/22	ND, RDL=1.0		mg/kg	
			Acid Extractable Silver (Ag)	2016/03/22	ND, RDL=0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2016/03/22	ND, RDL=5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2016/03/22	ND, RDL=0.10		mg/kg	

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4426952	BAN	RPD	Acid Extractable Tin (Sn)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Uranium (U)	2016/03/22	ND, RDL=0.10		mg/kg	
			Acid Extractable Vanadium (V)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2016/03/22	ND, RDL=5.0		mg/kg	
			Acid Extractable Aluminum (Al)	2016/03/22	2.5		%	35
			Acid Extractable Antimony (Sb)	2016/03/22	NC		%	35
			Acid Extractable Arsenic (As)	2016/03/22	NC		%	35
			Acid Extractable Barium (Ba)	2016/03/22	6.8		%	35
			Acid Extractable Beryllium (Be)	2016/03/22	NC		%	35
			Acid Extractable Boron (B)	2016/03/22	NC		%	35
			Acid Extractable Cadmium (Cd)	2016/03/22	NC		%	35
			Acid Extractable Chromium (Cr)	2016/03/22	0.90		%	35
			Acid Extractable Cobalt (Co)	2016/03/22	0.11		%	35
			Acid Extractable Copper (Cu)	2016/03/22	1.3		%	35
			Acid Extractable Iron (Fe)	2016/03/22	0.097		%	35
			Acid Extractable Lead (Pb)	2016/03/22	0.21		%	35
			Acid Extractable Manganese (Mn)	2016/03/22	1.2		%	35
			Acid Extractable Mercury (Hg)	2016/03/22	NC		%	35
			Acid Extractable Molybdenum (Mo)	2016/03/22	NC		%	35
			Acid Extractable Nickel (Ni)	2016/03/22	0.14		%	35
			Acid Extractable Selenium (Se)	2016/03/22	NC		%	35
			Acid Extractable Silver (Ag)	2016/03/22	NC		%	35
			Acid Extractable Strontium (Sr)	2016/03/22	NC		%	35
			Acid Extractable Thallium (Tl)	2016/03/22	NC		%	35
			Acid Extractable Tin (Sn)	2016/03/22	NC		%	35
			Acid Extractable Uranium (U)	2016/03/22	0.75		%	35
			Acid Extractable Vanadium (V)	2016/03/22	0.20		%	35
			Acid Extractable Zinc (Zn)	2016/03/22	1.8		%	35
4427007	KCR	Spiked Blank	Isobutylbenzene - Extractable	2016/03/22		77	%	30 - 130
			n-Dotriacontane - Extractable	2016/03/22		73	%	30 - 130
			>C10-C16 Hydrocarbons	2016/03/22		69	%	30 - 130
			>C16-C21 Hydrocarbons	2016/03/22		69	%	30 - 130
			>C21-<C32 Hydrocarbons	2016/03/22		88	%	30 - 130
4427007	KCR	Method Blank	Isobutylbenzene - Extractable	2016/03/22		91	%	30 - 130
			n-Dotriacontane - Extractable	2016/03/22		93	%	30 - 130
			>C10-C16 Hydrocarbons	2016/03/22	ND, RDL=10		mg/kg	
			>C16-C21 Hydrocarbons	2016/03/22	ND, RDL=10		mg/kg	
			>C21-<C32 Hydrocarbons	2016/03/22	ND, RDL=15		mg/kg	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC			Date		Value	Recovery	UNITS	QC Limits
Batch	Init	QC Type	Parameter	Analyzed				
4427539	TPE	RPD	Soluble (5:1) pH	2016/03/22	0.41		%	N/A
<p>N/A = Not Applicable</p> <p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>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.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.</p> <p>NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).</p> <p>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 (one or both samples < 5x RDL).</p> <p>(1) Recovery is within QC acceptance limits. < 10 % of compounds in multi-component analysis in violation.</p> <p>(2) Duplicate: results are outside acceptance limit. Sample was past recommended hold time for repeat analysis.</p> <p>(3) Duplicate: results are outside acceptance limit. Sample was past recommended hold time for repeat analysis. Elevated PAH RDL(s) due to sample dilution.</p>								

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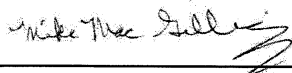
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VALIDATION SIGNATURE PAGE

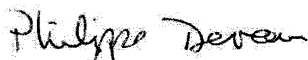
The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Brad Newman, Scientific Specialist



Mike MacGillivray, Scientific Specialist (Inorganics)



Phil Deveau

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Your Project #: 721329/3084
Site Location: LONG COVE
Your C.O.C. #: D 05948

Attention: Cathy Martin

Public Works & Government Services Canada
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Report Date: 2016/03/31
Report #: R3947070
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B651625

Received: 2016/03/15, 10:21

Sample Matrix: Soil
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Free (WAD) Cyanide (1)	5	2016/03/21	2016/03/22	CAM SOP-00457	OMOE E3015 m
TEH in Soil (PIRI) (2, 3)	5	2016/03/22	2016/03/22	ATL SOP 00111	Atl. RBCA v3 m
Metals Leach TCLP/CGSB extraction (2)	1	2016/03/30	2016/03/30	ATL SOP 00058	EPA 6020A R1 m
Metals Solids Acid Extr. ICPMS (2)	1	2016/03/18	2016/03/18	ATL SOP 00058	EPA 6020A R1 m
Metals Solids Acid Extr. ICPMS (2)	2	2016/03/21	2016/03/22	ATL SOP 00058	EPA 6020A R1 m
Metals Solids Acid Extr. ICPMS (2)	2	2016/03/22	2016/03/22	ATL SOP 00058	EPA 6020A R1 m
Moisture (2)	5	N/A	2016/03/17	ATL SOP 00001	OMOE Handbook 1983 m
PAH in sediment by GC/MS (Low Level) (2, 3)	5	2016/03/22	2016/03/25	ATL SOP 00102	EPA 8270D 2007 m
Low Level PCB in Soil by GC-ECD (2)	5	2016/03/21	2016/03/22	ATL SOP 00106	EPA 8082A m
PCB Aroclor sum (low level soil) (2)	5	N/A	2016/03/22		Auto Calc.
pH (5:1 DI Water Extract) (2)	3	2016/03/18	2016/03/21	ATL SOP 00003	SM 22 4500-H+ B m
pH (5:1 DI Water Extract) (2)	2	2016/03/22	2016/03/22	ATL SOP 00003	SM 22 4500-H+ B m
VPH in Soil (PIRI) (2)	1	2016/03/15	2016/03/18	ATL SOP 00119	Atl. RBCA v3 m
VPH in Soil (PIRI) (2)	4	2016/03/16	2016/03/18	ATL SOP 00119	Atl. RBCA v3 m
TCLP Inorganic extraction - pH (2)	1	N/A	2016/03/30	ATL SOP 00035	EPA 1311 m
TCLP Inorganic extraction - Weight (2)	1	N/A	2016/03/30	ATL SOP 00035	EPA 1311 m
ModTPH (T1) Calc. for Soil (2)	1	N/A	2016/03/18	N/A	Atl. RBCA v3 m
ModTPH (T1) Calc. for Soil (2)	4	N/A	2016/03/21	N/A	Atl. RBCA v3 m

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 Maxxam Analytics Mississauga

(2) This test was performed by Maxxam Bedford

(3) Soils are reported on a dry weight basis unless otherwise specified.

Attention: Cathy Martin

Public Works & Government Services Canada
PO Box 4600
10 Barter's Hill
St. John's, NL
A1C 5T2

Your P.O. #: CALLUP #96
Your Project #: 721329/3084
Site Location: LONG COVE
Your C.O.C. #: D 05948

Report Date: 2016/03/31
Report #: R3947070
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B651625

Received: 2016/03/15, 10:21

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Heather Macumber, Project Manager
Email: HMacumber@maxxam.ca
Phone# (902)420-0203 Ext:226

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B651625
Report Date: 2016/03/31

Public Works & Government Services Canada
Client Project #: 721329/3084
Site Location: LONG COVE
Your P.O. #: CALLUP #96

RBCA HYDROCARBONS IN SOIL (SOIL)

Maxxam ID		CAE411		CAE412	CAE413	CAE414		
Sampling Date		2016/03/09 15:00		2016/03/08 16:00	2016/03/09 16:00	2016/03/10 16:00		
COC Number		D 05948		D 05948	D 05948	D 05948		
	UNITS	BH1-MS1-0-0.40Z	QC Batch	BH2-MS1-OB	BH3-MS1-0-1.0Z	BH4-MS1-OB	RDL	QC Batch
Petroleum Hydrocarbons								
Benzene	mg/kg	ND	4421576	ND	ND	ND	0.025	4423779
Toluene	mg/kg	ND	4421576	ND	ND	ND	0.025	4423779
Ethylbenzene	mg/kg	ND	4421576	ND	ND	ND	0.025	4423779
Total Xylenes	mg/kg	ND	4421576	ND	0.079	ND	0.050	4423779
C6 - C10 (less BTEX)	mg/kg	ND	4421576	ND	ND	ND	2.5	4423779
>C10-C16 Hydrocarbons	mg/kg	ND	4427007	ND	ND	ND	10	4427007
>C16-C21 Hydrocarbons	mg/kg	ND	4427007	16	37	ND	10	4427007
>C21-<C32 Hydrocarbons	mg/kg	ND	4427007	66	120	ND	15	4427007
Modified TPH (Tier1)	mg/kg	ND	4417932	82	160	ND	15	4417932
Reached Baseline at C32	mg/kg	NA	4427007	Yes	Yes	NA	N/A	4427007
Hydrocarbon Resemblance	mg/kg	NA	4427007	COMMENT (1)	COMMENT (2)	NA	N/A	4427007
Surrogate Recovery (%)								
Isobutylbenzene - Extractable	%	95	4427007	103	91	98		4427007
n-Dotriacontane - Extractable	%	90	4427007	101	92	86		4427007
Isobutylbenzene - Volatile	%	104	4421576	93	97	89		4423779
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not detected N/A = Not Applicable (1) Lube oil fraction. (2) Lube oil fraction. Unidentified compound(s) in fuel / lube range.								

RBCA HYDROCARBONS IN SOIL (SOIL)

Maxxam ID		CAE415		
Sampling Date		2016/03/10 16:00		
COC Number		D 05948		
	UNITS	BH4-MS2-0.15-1.0Z	RDL	QC Batch
Petroleum Hydrocarbons				
Benzene	mg/kg	ND	0.025	4423779
Toluene	mg/kg	ND	0.025	4423779
Ethylbenzene	mg/kg	ND	0.025	4423779
Total Xylenes	mg/kg	ND	0.050	4423779
C6 - C10 (less BTEX)	mg/kg	ND	2.5	4423779
>C10-C16 Hydrocarbons	mg/kg	ND	10	4427007
>C16-C21 Hydrocarbons	mg/kg	ND	10	4427007
>C21-<C32 Hydrocarbons	mg/kg	ND	15	4427007
Modified TPH (Tier1)	mg/kg	ND	15	4417932
Reached Baseline at C32	mg/kg	NA	N/A	4427007
Hydrocarbon Resemblance	mg/kg	NA	N/A	4427007
Surrogate Recovery (%)				
Isobutylbenzene - Extractable	%	95		4427007
n-Dotriacontane - Extractable	%	91		4427007
Isobutylbenzene - Volatile	%	95		4423779
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				
ND = Not detected				
N/A = Not Applicable				

Maxxam Job #: B651625
Report Date: 2016/03/31

Public Works & Government Services Canada
Client Project #: 721329/3084
Site Location: LONG COVE
Your P.O. #: CALLUP #96

ATLANTIC TCLP LEACHATE + METALS (SOIL)

Maxxam ID		CAE411		
Sampling Date		2016/03/09 15:00		
COC Number		D 05948		
	UNITS	BH1-MS1-0-0.40Z	RDL	QC Batch
Inorganics				
Sample Weight (as received)	g	100	N/A	4434870
Initial pH	N/A	4.9		4434874
Final pH	N/A	5.0		4434874
Metals				
Leachable Arsenic (As)	ug/L	ND	20	4436262
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable ND = Not detected				

Maxxam Job #: B651625
Report Date: 2016/03/31

Public Works & Government Services Canada
Client Project #: 721329/3084
Site Location: LONG COVE
Your P.O. #: CALLUP #96

RESULTS OF ANALYSES OF SOIL

Maxxam ID		CAE411	CAE412		CAE413	CAE414	CAE415		
Sampling Date		2016/03/09 15:00	2016/03/08 16:00		2016/03/09 16:00	2016/03/10 16:00	2016/03/10 16:00		
COC Number		D 05948	D 05948		D 05948	D 05948	D 05948		
	UNITS	BH1-MS1-0-0.40Z	BH2-MS1-OB	QC Batch	BH3-MS1-0-1.0Z	BH4-MS1-OB	BH4-MS2-0.15-1.0Z	RDL	QC Batch
Inorganics									
Free Cyanide	ug/g	ND	0.02	4426155	0.02	0.09	0.05	0.01	4426155
Moisture	%	22	34	4419319	51	82	74	1.0	4419319
Soluble (5:1) pH	pH	7.42	8.16	4427539	7.54	7.07	7.26	N/A	4425975
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not detected N/A = Not Applicable									

Maxxam Job #: B651625
Report Date: 2016/03/31

Public Works & Government Services Canada
Client Project #: 721329/3084
Site Location: LONG COVE
Your P.O. #: CALLUP #96

PCB'S AND DDT BY GC-ECD (SOIL)

Maxxam ID		CAE411	CAE412		CAE413	CAE413		CAE414		
Sampling Date		2016/03/09 15:00	2016/03/08 16:00		2016/03/09 16:00	2016/03/09 16:00		2016/03/10 16:00		
COC Number		D 05948	D 05948		D 05948	D 05948		D 05948		
	UNITS	BH1-MS1-0-0.40Z	BH2-MS1-0B	RDL	BH3-MS1-0-1.0Z	BH3-MS1-0-1.0Z Lab-Dup	RDL	BH4-MS1-0B	RDL	QC Batch

PCBs										
Aroclor 1016	mg/kg	ND	ND	0.010	ND	ND	0.030	ND	0.010	4425465
Aroclor 1221	mg/kg	ND	ND	0.010	ND	ND	0.030	ND	0.010	4425465
Aroclor 1232	mg/kg	ND	ND	0.010	ND	ND	0.030	ND	0.010	4425465
Aroclor 1248	mg/kg	ND	ND	0.010	ND	ND	0.030	ND	0.010	4425465
Aroclor 1242	mg/kg	ND	ND	0.010	ND	ND	0.030	ND	0.010	4425465
Aroclor 1254	mg/kg	ND	ND	0.010	ND	ND	0.030	ND	0.010	4425465
Aroclor 1260	mg/kg	ND	ND	0.010	ND	ND	0.030	ND	0.010	4425465
Calculated Total PCB	mg/kg	ND	ND	0.010	ND		0.030	ND	0.010	4417940

Surrogate Recovery (%)

Decachlorobiphenyl	%	108 (1)	98		89 (2)	98 (2)		102 (1)		4425465
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RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Lab-Dup = Laboratory Initiated Duplicate

ND = Not detected

(1) PCB:Unidentified (possibly halogenated) compounds detected.

(2) Elevated PCB RDL due to matrix / co-extractive interference. PCB:Unidentified (possibly halogenated) compounds detected.

Maxxam ID		CAE415		
Sampling Date		2016/03/10 16:00		
COC Number		D 05948		
	UNITS	BH4-MS2-0.15-1.0Z	RDL	QC Batch

PCBs				
Aroclor 1016	mg/kg	ND	0.010	4425465
Aroclor 1221	mg/kg	ND	0.010	4425465
Aroclor 1232	mg/kg	ND	0.010	4425465
Aroclor 1248	mg/kg	ND	0.010	4425465
Aroclor 1242	mg/kg	ND	0.010	4425465
Aroclor 1254	mg/kg	ND	0.010	4425465
Aroclor 1260	mg/kg	ND	0.010	4425465
Calculated Total PCB	mg/kg	ND	0.010	4417940

Surrogate Recovery (%)

Decachlorobiphenyl	%	102		4425465
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RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

ND = Not detected

Maxxam Job #: B651625
Report Date: 2016/03/31

Public Works & Government Services Canada
Client Project #: 721329/3084
Site Location: LONG COVE
Your P.O. #: CALLUP #96

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		CAE411	CAE412		CAE413		CAE414		
Sampling Date		2016/03/09 15:00	2016/03/08 16:00		2016/03/09 16:00		2016/03/10 16:00		
COC Number		D 05948	D 05948		D 05948		D 05948		
	UNITS	BH1-MS1-0-0.40Z	BH2-MS1-OB	QC Batch	BH3-MS1-0-1.0Z	QC Batch	BH4-MS1-OB	RDL	QC Batch
Metals									
Acid Extractable Aluminum (Al)	mg/kg	16000	10000	4426952	11000	4425635	17000	10	4423055
Acid Extractable Antimony (Sb)	mg/kg	ND	ND	4426952	ND	4425635	ND	2.0	4423055
Acid Extractable Arsenic (As)	mg/kg	24	11	4426952	11	4425635	12	2.0	4423055
Acid Extractable Barium (Ba)	mg/kg	150	170	4426952	230	4425635	53	5.0	4423055
Acid Extractable Beryllium (Be)	mg/kg	ND	ND	4426952	ND	4425635	ND	2.0	4423055
Acid Extractable Boron (B)	mg/kg	ND	ND	4426952	ND	4425635	52	50	4423055
Acid Extractable Cadmium (Cd)	mg/kg	ND	0.44	4426952	0.60	4425635	0.53	0.30	4423055
Acid Extractable Chromium (Cr)	mg/kg	30	26	4426952	25	4425635	31	2.0	4423055
Acid Extractable Cobalt (Co)	mg/kg	22	12	4426952	11	4425635	13	1.0	4423055
Acid Extractable Copper (Cu)	mg/kg	64	49	4426952	55	4425635	22	2.0	4423055
Acid Extractable Iron (Fe)	mg/kg	36000	25000	4426952	23000	4425635	24000	50	4423055
Acid Extractable Lead (Pb)	mg/kg	22	30	4426952	28	4425635	12	0.50	4423055
Acid Extractable Manganese (Mn)	mg/kg	960	750	4426952	550	4425635	840	2.0	4423055
Acid Extractable Mercury (Hg)	mg/kg	ND	ND	4426952	0.10	4425635	ND	0.10	4423055
Acid Extractable Molybdenum (Mo)	mg/kg	ND	6.2	4426952	8.9	4425635	8.3	2.0	4423055
Acid Extractable Nickel (Ni)	mg/kg	34	24	4426952	22	4425635	26	2.0	4423055
Acid Extractable Selenium (Se)	mg/kg	ND	ND	4426952	ND	4425635	1.3	1.0	4423055
Acid Extractable Silver (Ag)	mg/kg	ND	ND	4426952	ND	4425635	ND	0.50	4423055
Acid Extractable Strontium (Sr)	mg/kg	20	64	4426952	210	4425635	79	5.0	4423055
Acid Extractable Thallium (Tl)	mg/kg	ND	0.10	4426952	0.17	4425635	ND	0.10	4423055
Acid Extractable Tin (Sn)	mg/kg	ND	ND	4426952	3.3	4425635	ND	2.0	4423055
Acid Extractable Uranium (U)	mg/kg	14	2.2	4426952	2.4	4425635	4.2	0.10	4423055
Acid Extractable Vanadium (V)	mg/kg	35	26	4426952	31	4425635	31	2.0	4423055
Acid Extractable Zinc (Zn)	mg/kg	110	160	4426952	110	4425635	79	5.0	4423055
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
ND = Not detected									

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		CAE414		CAE415		
Sampling Date		2016/03/10 16:00		2016/03/10 16:00		
COC Number		D 05948		D 05948		
	UNITS	BH4-MS1-OB Lab-Dup	QC Batch	BH4-MS2-0.15-1.0Z	RDL	QC Batch
Metals						
Acid Extractable Aluminum (Al)	mg/kg	16000	4423055	15000	10	4425635
Acid Extractable Antimony (Sb)	mg/kg	ND	4423055	ND	2.0	4425635
Acid Extractable Arsenic (As)	mg/kg	11	4423055	12	2.0	4425635
Acid Extractable Barium (Ba)	mg/kg	47	4423055	120	5.0	4425635
Acid Extractable Beryllium (Be)	mg/kg	ND	4423055	ND	2.0	4425635
Acid Extractable Boron (B)	mg/kg	ND	4423055	ND	50	4425635
Acid Extractable Cadmium (Cd)	mg/kg	0.48	4423055	0.52	0.30	4425635
Acid Extractable Chromium (Cr)	mg/kg	29	4423055	23	2.0	4425635
Acid Extractable Cobalt (Co)	mg/kg	12	4423055	7.8	1.0	4425635
Acid Extractable Copper (Cu)	mg/kg	21	4423055	63	2.0	4425635
Acid Extractable Iron (Fe)	mg/kg	23000	4423055	11000	50	4425635
Acid Extractable Lead (Pb)	mg/kg	11	4423055	6.5	0.50	4425635
Acid Extractable Manganese (Mn)	mg/kg	810	4423055	350	2.0	4425635
Acid Extractable Mercury (Hg)	mg/kg	ND	4423055	ND	0.10	4425635
Acid Extractable Molybdenum (Mo)	mg/kg	7.8	4423055	2.7	2.0	4425635
Acid Extractable Nickel (Ni)	mg/kg	25	4423055	22	2.0	4425635
Acid Extractable Selenium (Se)	mg/kg	1.0	4423055	1.3	1.0	4425635
Acid Extractable Silver (Ag)	mg/kg	ND	4423055	ND	0.50	4425635
Acid Extractable Strontium (Sr)	mg/kg	73	4423055	68	5.0	4425635
Acid Extractable Thallium (Tl)	mg/kg	ND	4423055	ND	0.10	4425635
Acid Extractable Tin (Sn)	mg/kg	ND	4423055	ND	2.0	4425635
Acid Extractable Uranium (U)	mg/kg	4.2	4423055	1.3	0.10	4425635
Acid Extractable Vanadium (V)	mg/kg	30	4423055	18	2.0	4425635
Acid Extractable Zinc (Zn)	mg/kg	78	4423055	110	5.0	4425635
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
Lab-Dup = Laboratory Initiated Duplicate						
ND = Not detected						

Maxxam Job #: B651625
Report Date: 2016/03/31

Public Works & Government Services Canada
Client Project #: 721329/3084
Site Location: LONG COVE
Your P.O. #: CALLUP #96

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		CAE411	CAE412	CAE413		CAE413		
Sampling Date		2016/03/09 15:00	2016/03/08 16:00	2016/03/09 16:00		2016/03/09 16:00		
COC Number		D 05948	D 05948	D 05948		D 05948		
	UNITS	BH1-MS1-0-0.40Z	BH2-MS1-0B	BH3-MS1-0-1.0Z	RDL	BH3-MS1-0-1.0Z Lab-Dup	RDL	QC Batch

Polyaromatic Hydrocarbons								
1-Methylnaphthalene	mg/kg	ND	ND	ND	0.0050	ND	0.0050	4426951
2-Methylnaphthalene	mg/kg	ND	ND	ND	0.0050	ND	0.0050	4426951
Acenaphthene	mg/kg	ND	0.017	ND	0.0050	0.017	0.0050	4426951
Acenaphthylene	mg/kg	ND	0.012	0.064	0.0050	0.24 (1)	0.0050	4426951
Anthracene	mg/kg	0.0070	0.18	0.64	0.0050	1.3 (1)	0.0050	4426951
Benzo(a)anthracene	mg/kg	0.024	0.20	6.1	0.0050	12 (2)	0.025	4426951
Benzo(a)pyrene	mg/kg	0.017	0.20	2.3	0.0050	6.1 (1)	0.0050	4426951
Benzo(b)fluoranthene	mg/kg	0.028	0.25	2.9	0.0050	8.2 (1)	0.0050	4426951
Benzo(g,h,i)perylene	mg/kg	0.011	0.11	0.56	0.0050	1.5 (1)	0.0050	4426951
Benzo(j)fluoranthene	mg/kg	0.013	0.14	1.5	0.0050	4.5 (1)	0.0050	4426951
Benzo(k)fluoranthene	mg/kg	0.016	0.14	1.9	0.0050	4.7 (1)	0.0050	4426951
Chrysene	mg/kg	0.030	0.34	4.9	0.0050	8.4 (2)	0.025	4426951
Dibenz(a,h)anthracene	mg/kg	ND	0.034	0.26	0.0050	0.65 (1)	0.0050	4426951
Fluoranthene	mg/kg	0.075	0.70	8.6	0.0050	26 (2)	0.025	4426951
Fluorene	mg/kg	ND	0.043	0.079	0.0050	0.18 (1)	0.0050	4426951
Indeno(1,2,3-cd)pyrene	mg/kg	0.0093	0.12	0.69	0.0050	1.8 (1)	0.0050	4426951
Naphthalene	mg/kg	ND	ND	ND	0.0050	ND	0.0050	4426951
Perylene	mg/kg	0.025	0.073	0.62	0.0050	1.6 (1)	0.0050	4426951
Phenanthrene	mg/kg	0.0071	0.28	0.54	0.0050	1.2 (1)	0.0050	4426951
Pyrene	mg/kg	0.039	0.36	4.7	0.0050	9.0 (1)	0.0050	4426951
Surrogate Recovery (%)								
D10-Anthracene	%	77	94	88		92		4426951
D14-Terphenyl	%	77	91	88		85		4426951
D8-Acenaphthylene	%	82	84	77		79		4426951

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Lab-Dup = Laboratory Initiated Duplicate

ND = Not detected

(1) Duplicate: results are outside acceptance limit. Sample was past recommended hold time for repeat analysis.

(2) Duplicate: results are outside acceptance limit. Sample was past recommended hold time for repeat analysis. Elevated PAH RDL(s) due to sample dilution.

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		CAE414	CAE415		
Sampling Date		2016/03/10 16:00	2016/03/10 16:00		
COC Number		D 05948	D 05948		
	UNITS	BH4-MS1-OB	BH4-MS2-0.15-1.OZ	RDL	QC Batch
Polyaromatic Hydrocarbons					
1-Methylnaphthalene	mg/kg	ND	ND	0.0050	4426951
2-Methylnaphthalene	mg/kg	ND	ND	0.0050	4426951
Acenaphthene	mg/kg	ND	ND	0.0050	4426951
Acenaphthylene	mg/kg	ND	ND	0.0050	4426951
Anthracene	mg/kg	0.066	ND	0.0050	4426951
Benzo(a)anthracene	mg/kg	0.32	ND	0.0050	4426951
Benzo(a)pyrene	mg/kg	0.17	ND	0.0050	4426951
Benzo(b)fluoranthene	mg/kg	0.23	ND	0.0050	4426951
Benzo(g,h,i)perylene	mg/kg	0.078	ND	0.0050	4426951
Benzo(j)fluoranthene	mg/kg	0.15	ND	0.0050	4426951
Benzo(k)fluoranthene	mg/kg	0.13	ND	0.0050	4426951
Chrysene	mg/kg	0.34	0.025	0.0050	4426951
Dibenz(a,h)anthracene	mg/kg	ND	ND	0.0050	4426951
Fluoranthene	mg/kg	0.95	0.064	0.0050	4426951
Fluorene	mg/kg	ND	ND	0.0050	4426951
Indeno(1,2,3-cd)pyrene	mg/kg	0.076	ND	0.0050	4426951
Naphthalene	mg/kg	ND	ND	0.0050	4426951
Perylene	mg/kg	0.22	0.19	0.0050	4426951
Phenanthrene	mg/kg	0.057	ND	0.0050	4426951
Pyrene	mg/kg	0.47	0.028	0.0050	4426951
Surrogate Recovery (%)					
D10-Anthracene	%	86	80		4426951
D14-Terphenyl	%	93	91		4426951
D8-Acenaphthylene	%	79	74		4426951
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
ND = Not detected					

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	6.3°C
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Revised report - TCLP + As added to sample BH1-MS1-0.040Z as per request from Cathy Martin. HM Mar 29/16

TEH Analysis: Silica gel clean-up performed prior to analysis as per client request.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4421576	MS3	Matrix Spike		Isobutylbenzene - Volatile	2016/03/17		90	%	60 - 130
				Benzene	2016/03/17		95	%	60 - 130
				Toluene	2016/03/17		96	%	60 - 130
				Ethylbenzene	2016/03/17		97	%	60 - 130
				Total Xylenes	2016/03/17		97	%	60 - 130
4421576	MS3	Spiked Blank		Isobutylbenzene - Volatile	2016/03/17		98	%	60 - 130
				Benzene	2016/03/17		98	%	60 - 140
				Toluene	2016/03/17		99	%	60 - 140
				Ethylbenzene	2016/03/17		102	%	60 - 140
				Total Xylenes	2016/03/17		101	%	60 - 140
4421576	MS3	Method Blank		Isobutylbenzene - Volatile	2016/03/17		100	%	60 - 130
				Benzene	2016/03/17	ND, RDL=0.025		mg/kg	
				Toluene	2016/03/17	ND, RDL=0.025		mg/kg	
				Ethylbenzene	2016/03/17	ND, RDL=0.025		mg/kg	
				Total Xylenes	2016/03/17	ND, RDL=0.050		mg/kg	
				C6 - C10 (less BTEX)	2016/03/17	ND, RDL=2.5		mg/kg	
				Benzene	2016/03/17	NC		%	50
				Toluene	2016/03/17	NC		%	50
				Ethylbenzene	2016/03/17	NC		%	50
				Total Xylenes	2016/03/17	NC		%	50
4423055	BAN	Matrix Spike [CAE414-02]		C6 - C10 (less BTEX)	2016/03/17	NC		%	50
				Acid Extractable Antimony (Sb)	2016/03/18		74 (1)	%	75 - 125
				Acid Extractable Arsenic (As)	2016/03/18		92	%	75 - 125
				Acid Extractable Barium (Ba)	2016/03/18		NC	%	75 - 125
				Acid Extractable Beryllium (Be)	2016/03/18		94	%	75 - 125
				Acid Extractable Boron (B)	2016/03/18		NC	%	75 - 125
				Acid Extractable Cadmium (Cd)	2016/03/18		92	%	75 - 125
				Acid Extractable Chromium (Cr)	2016/03/18		NC	%	75 - 125
				Acid Extractable Cobalt (Co)	2016/03/18		88	%	75 - 125
				Acid Extractable Copper (Cu)	2016/03/18		90	%	75 - 125
				Acid Extractable Lead (Pb)	2016/03/18		90	%	75 - 125
				Acid Extractable Manganese (Mn)	2016/03/18		NC	%	75 - 125
				Acid Extractable Mercury (Hg)	2016/03/18		87	%	75 - 125
				Acid Extractable Molybdenum (Mo)	2016/03/18		NC	%	75 - 125
				Acid Extractable Nickel (Ni)	2016/03/18		NC	%	75 - 125
				Acid Extractable Selenium (Se)	2016/03/18		89	%	75 - 125
				Acid Extractable Silver (Ag)	2016/03/18		93	%	75 - 125
				Acid Extractable Strontium (Sr)	2016/03/18		NC	%	75 - 125
				Acid Extractable Thallium (Tl)	2016/03/18		95	%	75 - 125
				Acid Extractable Tin (Sn)	2016/03/18		92	%	75 - 125
				Acid Extractable Uranium (U)	2016/03/18		94	%	75 - 125
				Acid Extractable Vanadium (V)	2016/03/18		NC	%	75 - 125
				Acid Extractable Zinc (Zn)	2016/03/18		NC	%	75 - 125
4423055	BAN	Spiked Blank		Acid Extractable Antimony (Sb)	2016/03/18		99	%	75 - 125
				Acid Extractable Arsenic (As)	2016/03/18		99	%	75 - 125
				Acid Extractable Barium (Ba)	2016/03/18		96	%	75 - 125
				Acid Extractable Beryllium (Be)	2016/03/18		98	%	75 - 125

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4423055	BAN	Method Blank	Acid Extractable Boron (B)	2016/03/18		101	%	75 - 125
			Acid Extractable Cadmium (Cd)	2016/03/18		99	%	75 - 125
			Acid Extractable Chromium (Cr)	2016/03/18		97	%	75 - 125
			Acid Extractable Cobalt (Co)	2016/03/18		96	%	75 - 125
			Acid Extractable Copper (Cu)	2016/03/18		96	%	75 - 125
			Acid Extractable Lead (Pb)	2016/03/18		97	%	75 - 125
			Acid Extractable Manganese (Mn)	2016/03/18		98	%	75 - 125
			Acid Extractable Mercury (Hg)	2016/03/18		106	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2016/03/18		100	%	75 - 125
			Acid Extractable Nickel (Ni)	2016/03/18		97	%	75 - 125
			Acid Extractable Selenium (Se)	2016/03/18		100	%	75 - 125
			Acid Extractable Silver (Ag)	2016/03/18		98	%	75 - 125
			Acid Extractable Strontium (Sr)	2016/03/18		100	%	75 - 125
			Acid Extractable Thallium (Tl)	2016/03/18		100	%	75 - 125
			Acid Extractable Tin (Sn)	2016/03/18		100	%	75 - 125
			Acid Extractable Uranium (U)	2016/03/18		100	%	75 - 125
			Acid Extractable Vanadium (V)	2016/03/18		98	%	75 - 125
			Acid Extractable Zinc (Zn)	2016/03/18		98	%	75 - 125
			Acid Extractable Aluminum (Al)	2016/03/18	ND, RDL=10		mg/kg	
			Acid Extractable Antimony (Sb)	2016/03/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Arsenic (As)	2016/03/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Barium (Ba)	2016/03/18	ND, RDL=5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2016/03/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Boron (B)	2016/03/18	ND, RDL=50		mg/kg	
			Acid Extractable Cadmium (Cd)	2016/03/18	ND, RDL=0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2016/03/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2016/03/18	ND, RDL=1.0		mg/kg	
			Acid Extractable Copper (Cu)	2016/03/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Iron (Fe)	2016/03/18	ND, RDL=50		mg/kg	
			Acid Extractable Lead (Pb)	2016/03/18	ND, RDL=0.50		mg/kg	
			Acid Extractable Manganese (Mn)	2016/03/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2016/03/18	ND, RDL=0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2016/03/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2016/03/18	ND, RDL=2.0		mg/kg	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
				Acid Extractable Selenium (Se)	2016/03/18	ND, RDL=1.0		mg/kg	
				Acid Extractable Silver (Ag)	2016/03/18	ND, RDL=0.50		mg/kg	
				Acid Extractable Strontium (Sr)	2016/03/18	ND, RDL=5.0		mg/kg	
				Acid Extractable Thallium (Tl)	2016/03/18	ND, RDL=0.10		mg/kg	
				Acid Extractable Tin (Sn)	2016/03/18	ND, RDL=2.0		mg/kg	
				Acid Extractable Uranium (U)	2016/03/18	ND, RDL=0.10		mg/kg	
				Acid Extractable Vanadium (V)	2016/03/18	ND, RDL=2.0		mg/kg	
				Acid Extractable Zinc (Zn)	2016/03/18	ND, RDL=5.0		mg/kg	
4423055	BAN	RPD [CAE414-02]		Acid Extractable Aluminum (Al)	2016/03/18	4.6		%	35
				Acid Extractable Antimony (Sb)	2016/03/18	NC		%	35
				Acid Extractable Arsenic (As)	2016/03/18	7.0		%	35
				Acid Extractable Barium (Ba)	2016/03/18	11		%	35
				Acid Extractable Beryllium (Be)	2016/03/18	NC		%	35
				Acid Extractable Boron (B)	2016/03/18	NC		%	35
				Acid Extractable Cadmium (Cd)	2016/03/18	NC		%	35
				Acid Extractable Chromium (Cr)	2016/03/18	6.2		%	35
				Acid Extractable Cobalt (Co)	2016/03/18	5.3		%	35
				Acid Extractable Copper (Cu)	2016/03/18	1.6		%	35
				Acid Extractable Iron (Fe)	2016/03/18	4.0		%	35
				Acid Extractable Lead (Pb)	2016/03/18	8.0		%	35
				Acid Extractable Manganese (Mn)	2016/03/18	3.2		%	35
				Acid Extractable Mercury (Hg)	2016/03/18	NC		%	35
				Acid Extractable Molybdenum (Mo)	2016/03/18	NC		%	35
				Acid Extractable Nickel (Ni)	2016/03/18	4.8		%	35
				Acid Extractable Selenium (Se)	2016/03/18	NC		%	35
				Acid Extractable Silver (Ag)	2016/03/18	NC		%	35
				Acid Extractable Strontium (Sr)	2016/03/18	7.5		%	35
				Acid Extractable Thallium (Tl)	2016/03/18	NC		%	35
				Acid Extractable Tin (Sn)	2016/03/18	NC		%	35
				Acid Extractable Uranium (U)	2016/03/18	2.0		%	35
				Acid Extractable Vanadium (V)	2016/03/18	3.5		%	35
				Acid Extractable Zinc (Zn)	2016/03/18	0.29		%	35
4423779	MS3	Matrix Spike		Isobutylbenzene - Volatile	2016/03/18		104	%	60 - 130
				Benzene	2016/03/18		101	%	60 - 130
				Toluene	2016/03/18		103	%	60 - 130
				Ethylbenzene	2016/03/18		105	%	60 - 130
				Total Xylenes	2016/03/18		105	%	60 - 130
4423779	MS3	Spiked Blank		Isobutylbenzene - Volatile	2016/03/18		98	%	60 - 130
				Benzene	2016/03/18		98	%	60 - 140
				Toluene	2016/03/18		99	%	60 - 140
				Ethylbenzene	2016/03/18		101	%	60 - 140
				Total Xylenes	2016/03/18		101	%	60 - 140
4423779	MS3	Method Blank		Isobutylbenzene - Volatile	2016/03/18		102	%	60 - 130

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QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
				Benzene	2016/03/18	ND, RDL=0.025		mg/kg	
				Toluene	2016/03/18	ND, RDL=0.025		mg/kg	
				Ethylbenzene	2016/03/18	ND, RDL=0.025		mg/kg	
				Total Xylenes	2016/03/18	ND, RDL=0.050		mg/kg	
				C6 - C10 (less BTEX)	2016/03/18	ND, RDL=2.5		mg/kg	
4423779	MS3	RPD		Benzene	2016/03/18	NC		%	50
				Toluene	2016/03/18	NC		%	50
				Ethylbenzene	2016/03/18	NC		%	50
				Total Xylenes	2016/03/18	NC		%	50
				C6 - C10 (less BTEX)	2016/03/18	NC		%	50
4425465	LGE	Matrix Spike [CAE413-02]		Decachlorobiphenyl	2016/03/22		99	%	70 - 130
				Aroclor 1254	2016/03/22		97	%	30 - 130
4425465	LGE	Spiked Blank		Decachlorobiphenyl	2016/03/22		112	%	70 - 130
				Aroclor 1254	2016/03/22		110	%	30 - 130
4425465	LGE	Method Blank		Decachlorobiphenyl	2016/03/22		103	%	70 - 130
				Aroclor 1016	2016/03/22	ND, RDL=0.010		mg/kg	
				Aroclor 1221	2016/03/22	ND, RDL=0.010		mg/kg	
				Aroclor 1232	2016/03/22	ND, RDL=0.010		mg/kg	
				Aroclor 1248	2016/03/22	ND, RDL=0.010		mg/kg	
				Aroclor 1242	2016/03/22	ND, RDL=0.010		mg/kg	
				Aroclor 1254	2016/03/22	ND, RDL=0.010		mg/kg	
				Aroclor 1260	2016/03/22	ND, RDL=0.010		mg/kg	
4425465	LGE	RPD [CAE413-02]		Aroclor 1016	2016/03/22	NC		%	50
				Aroclor 1221	2016/03/22	NC		%	50
				Aroclor 1232	2016/03/22	NC		%	50
				Aroclor 1248	2016/03/22	NC		%	50
				Aroclor 1242	2016/03/22	NC		%	50
				Aroclor 1254	2016/03/22	NC		%	50
				Aroclor 1260	2016/03/22	NC		%	50
4425635	BAN	Matrix Spike		Acid Extractable Antimony (Sb)	2016/03/22		89	%	75 - 125
				Acid Extractable Arsenic (As)	2016/03/22		94	%	75 - 125
				Acid Extractable Barium (Ba)	2016/03/22		NC	%	75 - 125
				Acid Extractable Beryllium (Be)	2016/03/22		92	%	75 - 125
				Acid Extractable Boron (B)	2016/03/22		86	%	75 - 125
				Acid Extractable Cadmium (Cd)	2016/03/22		95	%	75 - 125
				Acid Extractable Chromium (Cr)	2016/03/22		95	%	75 - 125
				Acid Extractable Cobalt (Co)	2016/03/22		95	%	75 - 125
				Acid Extractable Copper (Cu)	2016/03/22		96	%	75 - 125
				Acid Extractable Lead (Pb)	2016/03/22		92	%	75 - 125

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QA/QC				Date				
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4425635	BAN	Spiked Blank	Acid Extractable Manganese (Mn)	2016/03/22		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2016/03/22		90	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2016/03/22		95	%	75 - 125
			Acid Extractable Nickel (Ni)	2016/03/22		98	%	75 - 125
			Acid Extractable Selenium (Se)	2016/03/22		96	%	75 - 125
			Acid Extractable Silver (Ag)	2016/03/22		96	%	75 - 125
			Acid Extractable Strontium (Sr)	2016/03/22		98	%	75 - 125
			Acid Extractable Thallium (Tl)	2016/03/22		96	%	75 - 125
			Acid Extractable Tin (Sn)	2016/03/22		97	%	75 - 125
			Acid Extractable Uranium (U)	2016/03/22		96	%	75 - 125
			Acid Extractable Vanadium (V)	2016/03/22		93	%	75 - 125
			Acid Extractable Zinc (Zn)	2016/03/22		NC	%	75 - 125
			Acid Extractable Antimony (Sb)	2016/03/22		95	%	75 - 125
			Acid Extractable Arsenic (As)	2016/03/22		97	%	75 - 125
			Acid Extractable Barium (Ba)	2016/03/22		92	%	75 - 125
			Acid Extractable Beryllium (Be)	2016/03/22		89	%	75 - 125
			Acid Extractable Boron (B)	2016/03/22		86	%	75 - 125
			Acid Extractable Cadmium (Cd)	2016/03/22		96	%	75 - 125
			Acid Extractable Chromium (Cr)	2016/03/22		96	%	75 - 125
			Acid Extractable Cobalt (Co)	2016/03/22		96	%	75 - 125
			Acid Extractable Copper (Cu)	2016/03/22		96	%	75 - 125
			Acid Extractable Lead (Pb)	2016/03/22		94	%	75 - 125
			Acid Extractable Manganese (Mn)	2016/03/22		96	%	75 - 125
			Acid Extractable Mercury (Hg)	2016/03/22		97	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2016/03/22		94	%	75 - 125
			Acid Extractable Nickel (Ni)	2016/03/22		97	%	75 - 125
			Acid Extractable Selenium (Se)	2016/03/22		97	%	75 - 125
			Acid Extractable Silver (Ag)	2016/03/22		97	%	75 - 125
			Acid Extractable Strontium (Sr)	2016/03/22		99	%	75 - 125
			Acid Extractable Thallium (Tl)	2016/03/22		96	%	75 - 125
			Acid Extractable Tin (Sn)	2016/03/22		96	%	75 - 125
			Acid Extractable Uranium (U)	2016/03/22		97	%	75 - 125
			Acid Extractable Vanadium (V)	2016/03/22		94	%	75 - 125
			Acid Extractable Zinc (Zn)	2016/03/22		98	%	75 - 125
4425635	BAN	Method Blank	Acid Extractable Aluminum (Al)	2016/03/22	ND, RDL=10		mg/kg	
			Acid Extractable Antimony (Sb)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Arsenic (As)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Barium (Ba)	2016/03/22	ND, RDL=5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Boron (B)	2016/03/22	ND, RDL=50		mg/kg	
			Acid Extractable Cadmium (Cd)	2016/03/22	ND, RDL=0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2016/03/22	ND, RDL=2.0		mg/kg	

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acid Extractable Cobalt (Co)	2016/03/22	ND, RDL=1.0		mg/kg	
			Acid Extractable Copper (Cu)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Iron (Fe)	2016/03/22	ND, RDL=50		mg/kg	
			Acid Extractable Lead (Pb)	2016/03/22	ND, RDL=0.50		mg/kg	
			Acid Extractable Manganese (Mn)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2016/03/22	ND, RDL=0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Selenium (Se)	2016/03/22	ND, RDL=1.0		mg/kg	
			Acid Extractable Silver (Ag)	2016/03/22	ND, RDL=0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2016/03/22	ND, RDL=5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2016/03/22	ND, RDL=0.10		mg/kg	
			Acid Extractable Tin (Sn)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Uranium (U)	2016/03/22	ND, RDL=0.10		mg/kg	
			Acid Extractable Vanadium (V)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2016/03/22	ND, RDL=5.0		mg/kg	
4425635	BAN	RPD	Acid Extractable Aluminum (Al)	2016/03/22	8.7		%	35
			Acid Extractable Antimony (Sb)	2016/03/22	NC		%	35
			Acid Extractable Arsenic (As)	2016/03/22	5.5		%	35
			Acid Extractable Barium (Ba)	2016/03/22	19		%	35
			Acid Extractable Beryllium (Be)	2016/03/22	NC		%	35
			Acid Extractable Boron (B)	2016/03/22	NC		%	35
			Acid Extractable Cadmium (Cd)	2016/03/22	NC		%	35
			Acid Extractable Chromium (Cr)	2016/03/22	6.8		%	35
			Acid Extractable Cobalt (Co)	2016/03/22	9.1		%	35
			Acid Extractable Copper (Cu)	2016/03/22	13		%	35
			Acid Extractable Iron (Fe)	2016/03/22	6.7		%	35
			Acid Extractable Lead (Pb)	2016/03/22	12		%	35
			Acid Extractable Manganese (Mn)	2016/03/22	18		%	35
			Acid Extractable Mercury (Hg)	2016/03/22	NC		%	35
			Acid Extractable Molybdenum (Mo)	2016/03/22	NC		%	35
			Acid Extractable Nickel (Ni)	2016/03/22	7.0		%	35
			Acid Extractable Selenium (Se)	2016/03/22	NC		%	35
			Acid Extractable Silver (Ag)	2016/03/22	NC		%	35

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC			Date		Value	Recovery	UNITS	QC Limits
Batch	Init	QC Type	Parameter	Analyzed				
			Acid Extractable Strontium (Sr)	2016/03/22	NC		%	35
			Acid Extractable Thallium (Tl)	2016/03/22	NC		%	35
			Acid Extractable Tin (Sn)	2016/03/22	NC		%	35
			Acid Extractable Uranium (U)	2016/03/22	NC		%	35
			Acid Extractable Vanadium (V)	2016/03/22	13		%	35
			Acid Extractable Zinc (Zn)	2016/03/22	14		%	35
4426155	XQI	Matrix Spike	Free Cyanide	2016/03/22		95	%	75 - 125
4426155	XQI	Spiked Blank	Free Cyanide	2016/03/22		101	%	80 - 120
4426155	XQI	Method Blank	Free Cyanide	2016/03/22	ND, RDL=0.01		ug/g	
4426155	XQI	RPD	Free Cyanide	2016/03/22	NC		%	35
4426951	RST	Matrix Spike [CAE413-02]	D10-Anthracene	2016/03/25		89	%	30 - 130
			D14-Terphenyl	2016/03/25		81	%	30 - 130
			D8-Acenaphthylene	2016/03/25		78	%	30 - 130
			1-Methylnaphthalene	2016/03/25		87	%	30 - 130
			2-Methylnaphthalene	2016/03/25		97	%	30 - 130
			Acenaphthene	2016/03/25		99	%	30 - 130
			Acenaphthylene	2016/03/25		NC	%	30 - 130
			Anthracene	2016/03/25		NC	%	30 - 130
			Benzo(a)anthracene	2016/03/25		NC	%	30 - 130
			Benzo(a)pyrene	2016/03/25		NC	%	30 - 130
			Benzo(b)fluoranthene	2016/03/25		NC	%	30 - 130
			Benzo(g,h,i)perylene	2016/03/25		NC	%	30 - 130
			Benzo(j)fluoranthene	2016/03/25		NC	%	30 - 130
			Benzo(k)fluoranthene	2016/03/25		NC	%	30 - 130
			Chrysene	2016/03/25		NC	%	30 - 130
			Dibenz(a,h)anthracene	2016/03/25		NC	%	30 - 130
			Fluoranthene	2016/03/25		NC	%	30 - 130
			Fluorene	2016/03/25		NC	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2016/03/25		NC	%	30 - 130
			Naphthalene	2016/03/25		92	%	30 - 130
			Perylene	2016/03/25		NC	%	30 - 130
			Phenanthrene	2016/03/25		NC	%	30 - 130
			Pyrene	2016/03/25		NC	%	30 - 130
4426951	RST	Spiked Blank	D10-Anthracene	2016/03/25		84	%	30 - 130
			D14-Terphenyl	2016/03/25		88	%	30 - 130
			D8-Acenaphthylene	2016/03/25		82	%	30 - 130
			1-Methylnaphthalene	2016/03/25		87	%	30 - 130
			2-Methylnaphthalene	2016/03/25		94	%	30 - 130
			Acenaphthene	2016/03/25		95	%	30 - 130
			Acenaphthylene	2016/03/25		101	%	30 - 130
			Anthracene	2016/03/25		110	%	30 - 130
			Benzo(a)anthracene	2016/03/25		104	%	30 - 130
			Benzo(a)pyrene	2016/03/25		87	%	30 - 130
			Benzo(b)fluoranthene	2016/03/25		87	%	30 - 130
			Benzo(g,h,i)perylene	2016/03/25		79	%	30 - 130
			Benzo(j)fluoranthene	2016/03/25		91	%	30 - 130
			Benzo(k)fluoranthene	2016/03/25		98	%	30 - 130
			Chrysene	2016/03/25		119	%	30 - 130
			Dibenz(a,h)anthracene	2016/03/25		69	%	30 - 130
			Fluoranthene	2016/03/25		115	%	30 - 130
			Fluorene	2016/03/25		104	%	30 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC					Date							
Batch	Init	QC Type		Parameter	Analyzed	Value	Recovery	UNITS	QC Limits			
4426951	RST	Method Blank		Indeno(1,2,3-cd)pyrene	2016/03/25		71	%	30 - 130			
				Naphthalene	2016/03/25		90	%	30 - 130			
				Perylene	2016/03/25		88	%	30 - 130			
				Phenanthrene	2016/03/25		113	%	30 - 130			
				Pyrene	2016/03/25		108	%	30 - 130			
				D10-Anthracene	2016/03/25		83	%	30 - 130			
				D14-Terphenyl	2016/03/25		86	%	30 - 130			
				D8-Acenaphthylene	2016/03/25		80	%	30 - 130			
				1-Methylnaphthalene	2016/03/25	ND, RDL=0.0050		mg/kg				
				2-Methylnaphthalene	2016/03/25	ND, RDL=0.0050		mg/kg				
				Acenaphthene	2016/03/25	ND, RDL=0.0050		mg/kg				
				Acenaphthylene	2016/03/25	ND, RDL=0.0050		mg/kg				
				Anthracene	2016/03/25	ND, RDL=0.0050		mg/kg				
				Benzo(a)anthracene	2016/03/25	ND, RDL=0.0050		mg/kg				
				Benzo(a)pyrene	2016/03/25	ND, RDL=0.0050		mg/kg				
				Benzo(b)fluoranthene	2016/03/25	ND, RDL=0.0050		mg/kg				
				Benzo(g,h,i)perylene	2016/03/25	ND, RDL=0.0050		mg/kg				
				Benzo(j)fluoranthene	2016/03/25	ND, RDL=0.0050		mg/kg				
				Benzo(k)fluoranthene	2016/03/25	ND, RDL=0.0050		mg/kg				
				Chrysene	2016/03/25	ND, RDL=0.0050		mg/kg				
				Dibenz(a,h)anthracene	2016/03/25	ND, RDL=0.0050		mg/kg				
				Fluoranthene	2016/03/25	ND, RDL=0.0050		mg/kg				
				Fluorene	2016/03/25	ND, RDL=0.0050		mg/kg				
				Indeno(1,2,3-cd)pyrene	2016/03/25	ND, RDL=0.0050		mg/kg				
				Naphthalene	2016/03/25	ND, RDL=0.0050		mg/kg				
				Perylene	2016/03/25	ND, RDL=0.0050		mg/kg				
				Phenanthrene	2016/03/25	ND, RDL=0.0050		mg/kg				
				Pyrene	2016/03/25	ND, RDL=0.0050		mg/kg				
			4426951	RST	RPD [CAE413-02]		1-Methylnaphthalene	2016/03/28	NC		%	50
							2-Methylnaphthalene	2016/03/28	NC		%	50

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC			Date		Value	Recovery	UNITS	QC Limits
Batch	Init	QC Type	Parameter	Analyzed				
4426952	BAN	Matrix Spike	Acenaphthene	2016/03/28	NC		%	50
			Acenaphthylene	2016/03/28	115 (2)		%	50
			Anthracene	2016/03/28	69 (2)		%	50
			Benzo(a)anthracene	2016/03/28	63 (3)		%	50
			Benzo(a)pyrene	2016/03/28	89 (2)		%	50
			Benzo(b)fluoranthene	2016/03/28	96 (2)		%	50
			Benzo(g,h,i)perylene	2016/03/28	90 (2)		%	50
			Benzo(j)fluoranthene	2016/03/28	97 (2)		%	50
			Benzo(k)fluoranthene	2016/03/28	87 (2)		%	50
			Chrysene	2016/03/28	53 (3)		%	50
			Dibenz(a,h)anthracene	2016/03/28	85 (2)		%	50
			Fluoranthene	2016/03/28	100 (3)		%	50
			Fluorene	2016/03/28	77 (2)		%	50
			Indeno(1,2,3-cd)pyrene	2016/03/28	88 (2)		%	50
			Naphthalene	2016/03/28	NC		%	50
			Perylene	2016/03/28	87 (2)		%	50
			Phenanthrene	2016/03/28	74 (2)		%	50
			Pyrene	2016/03/28	63 (2)		%	50
			Acid Extractable Antimony (Sb)	2016/03/22		89	%	75 - 125
			Acid Extractable Arsenic (As)	2016/03/22		95	%	75 - 125
			Acid Extractable Barium (Ba)	2016/03/22		NC	%	75 - 125
			Acid Extractable Beryllium (Be)	2016/03/22		94	%	75 - 125
			Acid Extractable Boron (B)	2016/03/22		87	%	75 - 125
			Acid Extractable Cadmium (Cd)	2016/03/22		92	%	75 - 125
			Acid Extractable Chromium (Cr)	2016/03/22		NC	%	75 - 125
			Acid Extractable Cobalt (Co)	2016/03/22		96	%	75 - 125
			Acid Extractable Copper (Cu)	2016/03/22		94	%	75 - 125
			Acid Extractable Lead (Pb)	2016/03/22		92	%	75 - 125
			Acid Extractable Manganese (Mn)	2016/03/22		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2016/03/22		87	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2016/03/22		96	%	75 - 125
			Acid Extractable Nickel (Ni)	2016/03/22		96	%	75 - 125
			Acid Extractable Selenium (Se)	2016/03/22		96	%	75 - 125
			Acid Extractable Silver (Ag)	2016/03/22		99	%	75 - 125
			Acid Extractable Strontium (Sr)	2016/03/22		101	%	75 - 125
			Acid Extractable Thallium (Tl)	2016/03/22		96	%	75 - 125
			Acid Extractable Tin (Sn)	2016/03/22		99	%	75 - 125
			Acid Extractable Uranium (U)	2016/03/22		97	%	75 - 125
			Acid Extractable Vanadium (V)	2016/03/22		95	%	75 - 125
			Acid Extractable Zinc (Zn)	2016/03/22		NC	%	75 - 125
4426952	BAN	Spiked Blank	Acid Extractable Antimony (Sb)	2016/03/22		99	%	75 - 125
			Acid Extractable Arsenic (As)	2016/03/22		99	%	75 - 125
			Acid Extractable Barium (Ba)	2016/03/22		95	%	75 - 125
			Acid Extractable Beryllium (Be)	2016/03/22		92	%	75 - 125
			Acid Extractable Boron (B)	2016/03/22		91	%	75 - 125
			Acid Extractable Cadmium (Cd)	2016/03/22		92	%	75 - 125
			Acid Extractable Chromium (Cr)	2016/03/22		96	%	75 - 125
			Acid Extractable Cobalt (Co)	2016/03/22		96	%	75 - 125
			Acid Extractable Copper (Cu)	2016/03/22		95	%	75 - 125
			Acid Extractable Lead (Pb)	2016/03/22		94	%	75 - 125
			Acid Extractable Manganese (Mn)	2016/03/22		97	%	75 - 125
			Acid Extractable Mercury (Hg)	2016/03/22		99	%	75 - 125

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4426952	BAN	Method Blank	Acid Extractable Molybdenum (Mo)	2016/03/22		101	%	75 - 125
			Acid Extractable Nickel (Ni)	2016/03/22		97	%	75 - 125
			Acid Extractable Selenium (Se)	2016/03/22		102	%	75 - 125
			Acid Extractable Silver (Ag)	2016/03/22		99	%	75 - 125
			Acid Extractable Strontium (Sr)	2016/03/22		100	%	75 - 125
			Acid Extractable Thallium (Tl)	2016/03/22		98	%	75 - 125
			Acid Extractable Tin (Sn)	2016/03/22		103	%	75 - 125
			Acid Extractable Uranium (U)	2016/03/22		101	%	75 - 125
			Acid Extractable Vanadium (V)	2016/03/22		99	%	75 - 125
			Acid Extractable Zinc (Zn)	2016/03/22		96	%	75 - 125
			Acid Extractable Aluminum (Al)	2016/03/22	ND, RDL=10		mg/kg	
			Acid Extractable Antimony (Sb)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Arsenic (As)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Barium (Ba)	2016/03/22	ND, RDL=5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Boron (B)	2016/03/22	ND, RDL=50		mg/kg	
			Acid Extractable Cadmium (Cd)	2016/03/22	ND, RDL=0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2016/03/22	ND, RDL=1.0		mg/kg	
			Acid Extractable Copper (Cu)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Iron (Fe)	2016/03/22	ND, RDL=50		mg/kg	
			Acid Extractable Lead (Pb)	2016/03/22	ND, RDL=0.50		mg/kg	
			Acid Extractable Manganese (Mn)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2016/03/22	ND, RDL=0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Selenium (Se)	2016/03/22	ND, RDL=1.0		mg/kg	
			Acid Extractable Silver (Ag)	2016/03/22	ND, RDL=0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2016/03/22	ND, RDL=5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2016/03/22	ND, RDL=0.10		mg/kg	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
				Acid Extractable Tin (Sn)	2016/03/22	ND, RDL=2.0		mg/kg	
				Acid Extractable Uranium (U)	2016/03/22	ND, RDL=0.10		mg/kg	
				Acid Extractable Vanadium (V)	2016/03/22	ND, RDL=2.0		mg/kg	
				Acid Extractable Zinc (Zn)	2016/03/22	ND, RDL=5.0		mg/kg	
4426952	BAN	RPD		Acid Extractable Aluminum (Al)	2016/03/22	2.5		%	35
				Acid Extractable Antimony (Sb)	2016/03/22	NC		%	35
				Acid Extractable Arsenic (As)	2016/03/22	NC		%	35
				Acid Extractable Barium (Ba)	2016/03/22	6.8		%	35
				Acid Extractable Beryllium (Be)	2016/03/22	NC		%	35
				Acid Extractable Boron (B)	2016/03/22	NC		%	35
				Acid Extractable Cadmium (Cd)	2016/03/22	NC		%	35
				Acid Extractable Chromium (Cr)	2016/03/22	0.90		%	35
				Acid Extractable Cobalt (Co)	2016/03/22	0.11		%	35
				Acid Extractable Copper (Cu)	2016/03/22	1.3		%	35
				Acid Extractable Iron (Fe)	2016/03/22	0.097		%	35
				Acid Extractable Lead (Pb)	2016/03/22	0.21		%	35
				Acid Extractable Manganese (Mn)	2016/03/22	1.2		%	35
				Acid Extractable Mercury (Hg)	2016/03/22	NC		%	35
				Acid Extractable Molybdenum (Mo)	2016/03/22	NC		%	35
				Acid Extractable Nickel (Ni)	2016/03/22	0.14		%	35
				Acid Extractable Selenium (Se)	2016/03/22	NC		%	35
				Acid Extractable Silver (Ag)	2016/03/22	NC		%	35
				Acid Extractable Strontium (Sr)	2016/03/22	NC		%	35
				Acid Extractable Thallium (Tl)	2016/03/22	NC		%	35
				Acid Extractable Tin (Sn)	2016/03/22	NC		%	35
				Acid Extractable Uranium (U)	2016/03/22	0.75		%	35
				Acid Extractable Vanadium (V)	2016/03/22	0.20		%	35
				Acid Extractable Zinc (Zn)	2016/03/22	1.8		%	35
4427007	KCR	Spiked Blank		Isobutylbenzene - Extractable	2016/03/22		77	%	30 - 130
				n-Dotriacontane - Extractable	2016/03/22		73	%	30 - 130
				>C10-C16 Hydrocarbons	2016/03/22		69	%	30 - 130
				>C16-C21 Hydrocarbons	2016/03/22		69	%	30 - 130
				>C21-<C32 Hydrocarbons	2016/03/22		88	%	30 - 130
4427007	KCR	Method Blank		Isobutylbenzene - Extractable	2016/03/22		91	%	30 - 130
				n-Dotriacontane - Extractable	2016/03/22		93	%	30 - 130
				>C10-C16 Hydrocarbons	2016/03/22	ND, RDL=10		mg/kg	
				>C16-C21 Hydrocarbons	2016/03/22	ND, RDL=10		mg/kg	
				>C21-<C32 Hydrocarbons	2016/03/22	ND, RDL=15		mg/kg	
4427539	TPE	RPD		Soluble (5:1) pH	2016/03/22	0.41		%	N/A
4434870	EDL	Method Blank		Sample Weight (as received)	2016/03/30	NA		g	
4436262	BAN	Matrix Spike [CAE411-01]		Leachable Arsenic (As)	2016/03/30		95	%	75 - 125
4436262	BAN	Spiked Blank		Leachable Arsenic (As)	2016/03/30		91	%	80 - 120

Maxxam Job #: B651625
Report Date: 2016/03/31

Public Works & Government Services Canada
Client Project #: 721329/3084
Site Location: LONG COVE
Your P.O. #: CALLUP #96

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
	4436262	BAN	Method Blank	Leachable Arsenic (As)	2016/03/30	ND, RDL=20		ug/L	
<p>N/A = Not Applicable</p> <p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>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.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.</p> <p>NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).</p> <p>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 (one or both samples < 5x RDL).</p> <p>(1) Recovery is within QC acceptance limits. < 10 % of compounds in multi-component analysis in violation.</p> <p>(2) Duplicate: results are outside acceptance limit. Sample was past recommended hold time for repeat analysis.</p> <p>(3) Duplicate: results are outside acceptance limit. Sample was past recommended hold time for repeat analysis. Elevated PAH RDL(s) due to sample dilution.</p>									

Maxxam Job #: B651625
Report Date: 2016/03/31

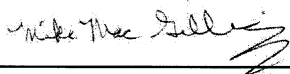
Public Works & Government Services Canada
Client Project #: 721329/3084
Site Location: LONG COVE
Your P.O. #: CALLUP #96

VALIDATION SIGNATURE PAGE


The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Brad Newman, Scientific Specialist



Mike MacGillivray, Scientific Specialist (Inorganics)



Phil Deveau

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Your P.O. #: CALL UP #96
Your Project #: 721329/3084
Site Location: LONG COVE, NL
Your C.O.C. #: D06087

Attention: Cathy Martin

Public Works & Government Services Canada
PO Box 4600
10 Barter's Hill
St. John's, NL
A1C 5T2

Report Date: 2016/03/28
Report #: R3943903
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B651632

Received: 2016/03/15, 10:59

Sample Matrix: SEDIMENT
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Free (WAD) Cyanide (1)	1	2016/03/19	2016/03/21	CAM SOP-00457	OMOE E3015 m
TEH in Soil (PIRI) (2, 4)	1	2016/03/21	2016/03/22	ATL SOP 00197	Atl. RBCA v3 m
Metals Solids Acid Extr. ICPMS (3)	1	2016/03/21	2016/03/22	ATL SOP 00058	EPA 6020A R1 m
Moisture	1	N/A	2016/03/18	ATL SOP-00196	OMOE Handbook 1983 m
PAH in sediment by GC/MS (Low Level) (3, 4)	1	2016/03/22	2016/03/25	ATL SOP 00102	EPA 8270D 2007 m
Low Level PCB in Soil by GC-ECD (3)	1	2016/03/21	2016/03/22	ATL SOP 00106	EPA 8082A m
PCB Aroclor sum (low level soil) (3)	1	N/A	2016/03/22		Auto Calc.
pH (5:1 DI Water Extract) (3)	1	2016/03/18	2016/03/21	ATL SOP 00003	SM 22 4500-H+ B m
VPH in Soil (PIRI) (1)	1	2016/03/17	2016/03/21	ATL SOP 00199	Atl. RBCA v3 m
ModTPH (T1) Calc. for Soil	1	N/A	2016/03/22	N/A	Atl. RBCA v3 m

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 Maxxam Analytics Mississauga

(2) Reported on a dry weight basis.

(3) This test was performed by Maxxam Bedford

(4) Soils are reported on a dry weight basis unless otherwise specified.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Heather Macumber, Project Manager

Email: HMacumber@maxxam.ca

Phone# (902)420-0203 Ext:226

=====

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RBCA HYDROCARBONS IN SOIL (SEDIMENT)

Maxxam ID		CAE455	CAE455		
Sampling Date		2016/03/13 12:00	2016/03/13 12:00		
COC Number		D06087	D06087		
	UNITS	BH5-MS1-OB	BH5-MS1-OB Lab-Dup	RDL	QC Batch
Inorganics					
Moisture	%	77	78	1.0	4421281
Petroleum Hydrocarbons					
Benzene	mg/kg	ND	ND	0.025	4421842
Toluene	mg/kg	ND	ND	0.025	4421842
Ethylbenzene	mg/kg	ND	ND	0.025	4421842
Total Xylenes	mg/kg	ND	ND	0.050	4421842
C6 - C10 (less BTEX)	mg/kg	ND	ND	2.5	4421842
>C10-C16 Hydrocarbons	mg/kg	ND	ND	10	4424059
>C16-C21 Hydrocarbons	mg/kg	ND	ND	10	4424059
>C21-<C32 Hydrocarbons	mg/kg	ND	ND	15	4424059
Modified TPH (Tier1)	mg/kg	ND		15	4426062
Reached Baseline at C32	mg/kg	Yes	Yes	N/A	4424059
Surrogate Recovery (%)					
Isobutylbenzene - Extractable	%	86 (1)	83 (1)		4424059
n-Dotriacontane - Extractable	%	119	114		4424059
Isobutylbenzene - Volatile	%	107	107		4421842
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate ND = Not detected N/A = Not Applicable (1) Triple silica gel cleanup was used to remove organic interferences from sample extract as per client request.					

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RESULTS OF ANALYSES OF SEDIMENT

Maxxam ID		CAE455		
Sampling Date		2016/03/13 12:00		
COC Number		D06087		
	UNITS	BH5-MS1-OB	RDL	QC Batch
Inorganics				
Free Cyanide	ug/g	0.04	0.02	4425143
Soluble (5:1) pH	pH	6.77	N/A	4425975
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				
N/A = Not Applicable				

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PCB'S AND DDT BY GC-ECD (SEDIMENT)

Maxxam ID		CAE455		
Sampling Date		2016/03/13 12:00		
COC Number		D06087		
	UNITS	BH5-MS1-OB	RDL	QC Batch
PCBs				
Aroclor 1016	mg/kg	ND	0.010	4425465
Aroclor 1221	mg/kg	ND	0.010	4425465
Aroclor 1232	mg/kg	ND	0.010	4425465
Aroclor 1248	mg/kg	ND	0.010	4425465
Aroclor 1242	mg/kg	ND	0.010	4425465
Aroclor 1254	mg/kg	ND	0.010	4425465
Aroclor 1260	mg/kg	ND	0.010	4425465
Calculated Total PCB	mg/kg	ND	0.010	4417940
Surrogate Recovery (%)				
Decachlorobiphenyl	%	102 (1)		4425465
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not detected (1) PCB: Unidentified (possibly halogenated) compounds detected.				

ELEMENTS BY ATOMIC SPECTROSCOPY (SEDIMENT)

Maxxam ID		CAE455		
Sampling Date		2016/03/13 12:00		
COC Number		D06087		
	UNITS	BH5-MS1-OB	RDL	QC Batch
Metals				
Acid Extractable Aluminum (Al)	mg/kg	15000	10	4425635
Acid Extractable Antimony (Sb)	mg/kg	ND	2.0	4425635
Acid Extractable Arsenic (As)	mg/kg	14	2.0	4425635
Acid Extractable Barium (Ba)	mg/kg	140	5.0	4425635
Acid Extractable Beryllium (Be)	mg/kg	ND	2.0	4425635
Acid Extractable Boron (B)	mg/kg	51	50	4425635
Acid Extractable Cadmium (Cd)	mg/kg	0.46	0.30	4425635
Acid Extractable Chromium (Cr)	mg/kg	30	2.0	4425635
Acid Extractable Cobalt (Co)	mg/kg	13	1.0	4425635
Acid Extractable Copper (Cu)	mg/kg	70	2.0	4425635
Acid Extractable Iron (Fe)	mg/kg	25000	50	4425635
Acid Extractable Lead (Pb)	mg/kg	34	0.50	4425635
Acid Extractable Manganese (Mn)	mg/kg	600	2.0	4425635
Acid Extractable Mercury (Hg)	mg/kg	0.11	0.10	4425635
Acid Extractable Molybdenum (Mo)	mg/kg	6.8	2.0	4425635
Acid Extractable Nickel (Ni)	mg/kg	24	2.0	4425635
Acid Extractable Selenium (Se)	mg/kg	ND	1.0	4425635
Acid Extractable Silver (Ag)	mg/kg	ND	0.50	4425635
Acid Extractable Strontium (Sr)	mg/kg	73	5.0	4425635
Acid Extractable Thallium (Tl)	mg/kg	0.13	0.10	4425635
Acid Extractable Tin (Sn)	mg/kg	5.0	2.0	4425635
Acid Extractable Uranium (U)	mg/kg	3.6	0.10	4425635
Acid Extractable Vanadium (V)	mg/kg	34	2.0	4425635
Acid Extractable Zinc (Zn)	mg/kg	100	5.0	4425635
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				
ND = Not detected				

SEMI-VOLATILE ORGANICS BY GC-MS (SEDIMENT)

Maxxam ID		CAE455		
Sampling Date		2016/03/13 12:00		
COC Number		D06087		
	UNITS	BH5-MS1-OB	RDL	QC Batch
Polyaromatic Hydrocarbons				
1-Methylnaphthalene	mg/kg	ND	0.0050	4426951
2-Methylnaphthalene	mg/kg	ND	0.0050	4426951
Acenaphthene	mg/kg	0.037	0.0050	4426951
Acenaphthylene	mg/kg	0.15	0.0050	4426951
Anthracene	mg/kg	0.77	0.0050	4426951
Benzo(a)anthracene	mg/kg	5.6	0.0050	4426951
Benzo(a)pyrene	mg/kg	3.1	0.0050	4426951
Benzo(b)fluoranthene	mg/kg	3.9	0.0050	4426951
Benzo(g,h,i)perylene	mg/kg	1.1	0.0050	4426951
Benzo(j)fluoranthene	mg/kg	1.9	0.0050	4426951
Benzo(k)fluoranthene	mg/kg	2.2	0.0050	4426951
Chrysene	mg/kg	5.8	0.0050	4426951
Dibenz(a,h)anthracene	mg/kg	0.30	0.0050	4426951
Fluoranthene	mg/kg	17	0.0050	4426951
Fluorene	mg/kg	0.089	0.0050	4426951
Indeno(1,2,3-cd)pyrene	mg/kg	0.98	0.0050	4426951
Naphthalene	mg/kg	ND	0.0050	4426951
Perylene	mg/kg	1.0	0.0050	4426951
Phenanthrene	mg/kg	0.52	0.0050	4426951
Pyrene	mg/kg	5.6	0.0050	4426951
Surrogate Recovery (%)				
D10-Anthracene	%	89		4426951
D14-Terphenyl	%	94		4426951
D8-Acenaphthylene	%	80		4426951
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				
ND = Not detected				



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GENERAL COMMENTS

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
	4421281	ACL	RPD [CAE455-01]	Moisture	2016/03/18	0.39		%	25
	4421842	MCT	Spiked Blank	Isobutylbenzene - Volatile	2016/03/21		98	%	60 - 130
				Benzene	2016/03/21		69	%	60 - 140
				Toluene	2016/03/21		66	%	60 - 140
				Ethylbenzene	2016/03/21		69	%	60 - 140
				Total Xylenes	2016/03/21		72	%	60 - 140
	4421842	MCT	Method Blank	Isobutylbenzene - Volatile	2016/03/21		102	%	60 - 130
				Benzene	2016/03/21	ND, RDL=0.025		mg/kg	
				Toluene	2016/03/21	ND, RDL=0.025		mg/kg	
				Ethylbenzene	2016/03/21	ND, RDL=0.025		mg/kg	
				Total Xylenes	2016/03/21	ND, RDL=0.050		mg/kg	
				C6 - C10 (less BTEX)	2016/03/21	ND, RDL=2.5		mg/kg	
	4421842	MCT	RPD [CAE455-01]	Benzene	2016/03/21	NC		%	50
				Toluene	2016/03/21	NC		%	50
				Ethylbenzene	2016/03/21	NC		%	50
				Total Xylenes	2016/03/21	NC		%	50
				C6 - C10 (less BTEX)	2016/03/21	NC		%	50
	4424059	SPI	RPD [CAE455-01]	>C10-C16 Hydrocarbons	2016/03/22	NC		%	50
				>C16-C21 Hydrocarbons	2016/03/22	NC		%	50
				>C21-<C32 Hydrocarbons	2016/03/22	NC		%	50
	4425143	XQI	Matrix Spike	Free Cyanide	2016/03/21		105	%	75 - 125
	4425143	XQI	Spiked Blank	Free Cyanide	2016/03/21		98	%	80 - 120
	4425143	XQI	Method Blank	Free Cyanide	2016/03/21	ND, RDL=0.01		ug/g	
	4425143	XQI	RPD	Free Cyanide	2016/03/21	NC		%	35
	4425465	LGE	Matrix Spike	Decachlorobiphenyl	2016/03/22		99	%	70 - 130
				Aroclor 1254	2016/03/22		97	%	30 - 130
	4425465	LGE	Spiked Blank	Decachlorobiphenyl	2016/03/22		112	%	70 - 130
				Aroclor 1254	2016/03/22		110	%	30 - 130
	4425465	LGE	Method Blank	Decachlorobiphenyl	2016/03/22		103	%	70 - 130
				Aroclor 1016	2016/03/22	ND, RDL=0.010		mg/kg	
				Aroclor 1221	2016/03/22	ND, RDL=0.010		mg/kg	
				Aroclor 1232	2016/03/22	ND, RDL=0.010		mg/kg	
				Aroclor 1248	2016/03/22	ND, RDL=0.010		mg/kg	
				Aroclor 1242	2016/03/22	ND, RDL=0.010		mg/kg	
				Aroclor 1254	2016/03/22	ND, RDL=0.010		mg/kg	
				Aroclor 1260	2016/03/22	ND, RDL=0.010		mg/kg	
	4425465	LGE	RPD	Aroclor 1016	2016/03/22	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
				Aroclor 1221	2016/03/22	NC		%	50
				Aroclor 1232	2016/03/22	NC		%	50
				Aroclor 1248	2016/03/22	NC		%	50
				Aroclor 1242	2016/03/22	NC		%	50
				Aroclor 1254	2016/03/22	NC		%	50
				Aroclor 1260	2016/03/22	NC		%	50
4425635	BAN		Matrix Spike	Acid Extractable Antimony (Sb)	2016/03/22		89	%	75 - 125
				Acid Extractable Arsenic (As)	2016/03/22		94	%	75 - 125
				Acid Extractable Barium (Ba)	2016/03/22		NC	%	75 - 125
				Acid Extractable Beryllium (Be)	2016/03/22		92	%	75 - 125
				Acid Extractable Boron (B)	2016/03/22		86	%	75 - 125
				Acid Extractable Cadmium (Cd)	2016/03/22		95	%	75 - 125
				Acid Extractable Chromium (Cr)	2016/03/22		95	%	75 - 125
				Acid Extractable Cobalt (Co)	2016/03/22		95	%	75 - 125
				Acid Extractable Copper (Cu)	2016/03/22		96	%	75 - 125
				Acid Extractable Lead (Pb)	2016/03/22		92	%	75 - 125
				Acid Extractable Manganese (Mn)	2016/03/22		NC	%	75 - 125
				Acid Extractable Mercury (Hg)	2016/03/22		90	%	75 - 125
				Acid Extractable Molybdenum (Mo)	2016/03/22		95	%	75 - 125
				Acid Extractable Nickel (Ni)	2016/03/22		98	%	75 - 125
				Acid Extractable Selenium (Se)	2016/03/22		96	%	75 - 125
				Acid Extractable Silver (Ag)	2016/03/22		96	%	75 - 125
				Acid Extractable Strontium (Sr)	2016/03/22		98	%	75 - 125
				Acid Extractable Thallium (Tl)	2016/03/22		96	%	75 - 125
				Acid Extractable Tin (Sn)	2016/03/22		97	%	75 - 125
				Acid Extractable Uranium (U)	2016/03/22		96	%	75 - 125
				Acid Extractable Vanadium (V)	2016/03/22		93	%	75 - 125
				Acid Extractable Zinc (Zn)	2016/03/22		NC	%	75 - 125
4425635	BAN		Spiked Blank	Acid Extractable Antimony (Sb)	2016/03/22		95	%	75 - 125
				Acid Extractable Arsenic (As)	2016/03/22		97	%	75 - 125
				Acid Extractable Barium (Ba)	2016/03/22		92	%	75 - 125
				Acid Extractable Beryllium (Be)	2016/03/22		89	%	75 - 125
				Acid Extractable Boron (B)	2016/03/22		86	%	75 - 125
				Acid Extractable Cadmium (Cd)	2016/03/22		96	%	75 - 125
				Acid Extractable Chromium (Cr)	2016/03/22		96	%	75 - 125
				Acid Extractable Cobalt (Co)	2016/03/22		96	%	75 - 125
				Acid Extractable Copper (Cu)	2016/03/22		96	%	75 - 125
				Acid Extractable Lead (Pb)	2016/03/22		94	%	75 - 125
				Acid Extractable Manganese (Mn)	2016/03/22		96	%	75 - 125
				Acid Extractable Mercury (Hg)	2016/03/22		97	%	75 - 125
				Acid Extractable Molybdenum (Mo)	2016/03/22		94	%	75 - 125
				Acid Extractable Nickel (Ni)	2016/03/22		97	%	75 - 125
				Acid Extractable Selenium (Se)	2016/03/22		97	%	75 - 125
				Acid Extractable Silver (Ag)	2016/03/22		97	%	75 - 125
				Acid Extractable Strontium (Sr)	2016/03/22		99	%	75 - 125
				Acid Extractable Thallium (Tl)	2016/03/22		96	%	75 - 125
				Acid Extractable Tin (Sn)	2016/03/22		96	%	75 - 125
				Acid Extractable Uranium (U)	2016/03/22		97	%	75 - 125
				Acid Extractable Vanadium (V)	2016/03/22		94	%	75 - 125
				Acid Extractable Zinc (Zn)	2016/03/22		98	%	75 - 125

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4425635	BAN	Method Blank	Acid Extractable Aluminum (Al)	2016/03/22	ND, RDL=10		mg/kg	
			Acid Extractable Antimony (Sb)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Arsenic (As)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Barium (Ba)	2016/03/22	ND, RDL=5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Boron (B)	2016/03/22	ND, RDL=50		mg/kg	
			Acid Extractable Cadmium (Cd)	2016/03/22	ND, RDL=0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2016/03/22	ND, RDL=1.0		mg/kg	
			Acid Extractable Copper (Cu)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Iron (Fe)	2016/03/22	ND, RDL=50		mg/kg	
			Acid Extractable Lead (Pb)	2016/03/22	ND, RDL=0.50		mg/kg	
			Acid Extractable Manganese (Mn)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2016/03/22	ND, RDL=0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Selenium (Se)	2016/03/22	ND, RDL=1.0		mg/kg	
			Acid Extractable Silver (Ag)	2016/03/22	ND, RDL=0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2016/03/22	ND, RDL=5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2016/03/22	ND, RDL=0.10		mg/kg	
			Acid Extractable Tin (Sn)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Uranium (U)	2016/03/22	ND, RDL=0.10		mg/kg	
			Acid Extractable Vanadium (V)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2016/03/22	ND, RDL=5.0		mg/kg	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4425635	BAN	RPD		Acid Extractable Aluminum (Al)	2016/03/22	8.7		%	35
				Acid Extractable Antimony (Sb)	2016/03/22	NC		%	35
				Acid Extractable Arsenic (As)	2016/03/22	5.5		%	35
				Acid Extractable Barium (Ba)	2016/03/22	19		%	35
				Acid Extractable Beryllium (Be)	2016/03/22	NC		%	35
				Acid Extractable Boron (B)	2016/03/22	NC		%	35
				Acid Extractable Cadmium (Cd)	2016/03/22	NC		%	35
				Acid Extractable Chromium (Cr)	2016/03/22	6.8		%	35
				Acid Extractable Cobalt (Co)	2016/03/22	9.1		%	35
				Acid Extractable Copper (Cu)	2016/03/22	13		%	35
				Acid Extractable Iron (Fe)	2016/03/22	6.7		%	35
				Acid Extractable Lead (Pb)	2016/03/22	12		%	35
				Acid Extractable Manganese (Mn)	2016/03/22	18		%	35
				Acid Extractable Mercury (Hg)	2016/03/22	NC		%	35
				Acid Extractable Molybdenum (Mo)	2016/03/22	NC		%	35
				Acid Extractable Nickel (Ni)	2016/03/22	7.0		%	35
				Acid Extractable Selenium (Se)	2016/03/22	NC		%	35
				Acid Extractable Silver (Ag)	2016/03/22	NC		%	35
				Acid Extractable Strontium (Sr)	2016/03/22	NC		%	35
				Acid Extractable Thallium (Tl)	2016/03/22	NC		%	35
				Acid Extractable Tin (Sn)	2016/03/22	NC		%	35
				Acid Extractable Uranium (U)	2016/03/22	NC		%	35
				Acid Extractable Vanadium (V)	2016/03/22	13		%	35
				Acid Extractable Zinc (Zn)	2016/03/22	14		%	35
4426951	RST	Matrix Spike		D10-Anthracene	2016/03/25		89	%	30 - 130
				D14-Terphenyl	2016/03/25		81	%	30 - 130
				D8-Acenaphthylene	2016/03/25		78	%	30 - 130
				1-Methylnaphthalene	2016/03/25		87	%	30 - 130
				2-Methylnaphthalene	2016/03/25		97	%	30 - 130
				Acenaphthene	2016/03/25		99	%	30 - 130
				Acenaphthylene	2016/03/25		NC	%	30 - 130
				Anthracene	2016/03/25		NC	%	30 - 130
				Benzo(a)anthracene	2016/03/25		NC	%	30 - 130
				Benzo(a)pyrene	2016/03/25		NC	%	30 - 130
				Benzo(b)fluoranthene	2016/03/25		NC	%	30 - 130
				Benzo(g,h,i)perylene	2016/03/25		NC	%	30 - 130
				Benzo(j)fluoranthene	2016/03/25		NC	%	30 - 130
				Benzo(k)fluoranthene	2016/03/25		NC	%	30 - 130
				Chrysene	2016/03/25		NC	%	30 - 130
				Dibenz(a,h)anthracene	2016/03/25		NC	%	30 - 130
				Fluoranthene	2016/03/25		NC	%	30 - 130
				Fluorene	2016/03/25		NC	%	30 - 130
				Indeno(1,2,3-cd)pyrene	2016/03/25		NC	%	30 - 130
				Naphthalene	2016/03/25		92	%	30 - 130
				Perylene	2016/03/25		NC	%	30 - 130
				Phenanthrene	2016/03/25		NC	%	30 - 130
				Pyrene	2016/03/25		NC	%	30 - 130
4426951	RST	Spiked Blank		D10-Anthracene	2016/03/25		84	%	30 - 130
				D14-Terphenyl	2016/03/25		88	%	30 - 130
				D8-Acenaphthylene	2016/03/25		82	%	30 - 130
				1-Methylnaphthalene	2016/03/25		87	%	30 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4426951	RST	Method Blank	2-Methylnaphthalene	2016/03/25		94	%	30 - 130
			Acenaphthene	2016/03/25		95	%	30 - 130
			Acenaphthylene	2016/03/25		101	%	30 - 130
			Anthracene	2016/03/25		110	%	30 - 130
			Benzo(a)anthracene	2016/03/25		104	%	30 - 130
			Benzo(a)pyrene	2016/03/25		87	%	30 - 130
			Benzo(b)fluoranthene	2016/03/25		87	%	30 - 130
			Benzo(g,h,i)perylene	2016/03/25		79	%	30 - 130
			Benzo(j)fluoranthene	2016/03/25		91	%	30 - 130
			Benzo(k)fluoranthene	2016/03/25		98	%	30 - 130
			Chrysene	2016/03/25		119	%	30 - 130
			Dibenz(a,h)anthracene	2016/03/25		69	%	30 - 130
			Fluoranthene	2016/03/25		115	%	30 - 130
			Fluorene	2016/03/25		104	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2016/03/25		71	%	30 - 130
			Naphthalene	2016/03/25		90	%	30 - 130
			Perylene	2016/03/25		88	%	30 - 130
			Phenanthrene	2016/03/25		113	%	30 - 130
			Pyrene	2016/03/25		108	%	30 - 130
			D10-Anthracene	2016/03/25		83	%	30 - 130
			D14-Terphenyl	2016/03/25		86	%	30 - 130
			D8-Acenaphthylene	2016/03/25		80	%	30 - 130
			1-Methylnaphthalene	2016/03/25	ND, RDL=0.0050		mg/kg	
			2-Methylnaphthalene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Acenaphthene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Acenaphthylene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Anthracene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Benzo(a)anthracene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Benzo(a)pyrene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Benzo(b)fluoranthene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Benzo(g,h,i)perylene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Benzo(j)fluoranthene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Benzo(k)fluoranthene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Chrysene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Dibenz(a,h)anthracene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Fluoranthene	2016/03/25	ND, RDL=0.0050		mg/kg	

Maxxam Job #: B651632
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Public Works & Government Services Canada
Client Project #: 721329/3084
Site Location: LONG COVE, NL
Your P.O. #: CALL UP #96
Sampler Initials: FF

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4426951	RST	RPD	Fluorene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Indeno(1,2,3-cd)pyrene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Naphthalene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Perylene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Phenanthrene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Pyrene	2016/03/25	ND, RDL=0.0050		mg/kg	
			1-Methylnaphthalene	2016/03/28	NC		%	50
			2-Methylnaphthalene	2016/03/28	NC		%	50
			Acenaphthene	2016/03/28	NC		%	50
			Acenaphthylene	2016/03/28	115 (1)		%	50
			Anthracene	2016/03/28	69 (1)		%	50
			Benzo(a)anthracene	2016/03/28	63 (2)		%	50
			Benzo(a)pyrene	2016/03/28	89 (1)		%	50
			Benzo(b)fluoranthene	2016/03/28	96 (1)		%	50
			Benzo(g,h,i)perylene	2016/03/28	90 (1)		%	50
			Benzo(j)fluoranthene	2016/03/28	97 (1)		%	50
			Benzo(k)fluoranthene	2016/03/28	87 (1)		%	50
			Chrysene	2016/03/28	53 (2)		%	50
			Dibenz(a,h)anthracene	2016/03/28	85 (1)		%	50
			Fluoranthene	2016/03/28	100 (2)		%	50
			Fluorene	2016/03/28	77 (1)		%	50
			Indeno(1,2,3-cd)pyrene	2016/03/28	88 (1)		%	50
			Naphthalene	2016/03/28	NC		%	50
			Perylene	2016/03/28	87 (1)		%	50
			Phenanthrene	2016/03/28	74 (1)		%	50
			Pyrene	2016/03/28	63 (1)		%	50

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.

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 spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of 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 (one or both samples < 5x RDL).

(1) Duplicate: results are outside acceptance limit. Sample was past recommended hold time for repeat analysis.

(2) Duplicate: results are outside acceptance limit. Sample was past recommended hold time for repeat analysis. Elevated PAH RDL(s) due to sample dilution.

Maxxam Job #: B651632
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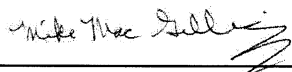
Public Works & Government Services Canada
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VALIDATION SIGNATURE PAGE

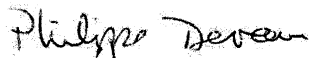
The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Cristina Carriere, Scientific Services



Mike MacGillivray, Scientific Specialist (Inorganics)



Phil Deveau



Rob Whelan, Laboratory Manager

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Your P.O. #: CALL UP #96
Your Project #: 721329/3084
Site Location: LONG COVE, NL
Your C.O.C. #: D06087

Attention: Cathy Martin

Public Works & Government Services Canada
PO Box 4600
10 Barter's Hill
St. John's, NL
A1C 5T2

Report Date: 2016/03/31
Report #: R3947065
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B651632

Received: 2016/03/15, 10:59

Sample Matrix: SEDIMENT
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Free (WAD) Cyanide (1)	1	2016/03/19	2016/03/21	CAM SOP-00457	OMOE E3015 m
TEH in Soil (PIRI) (2, 4)	1	2016/03/21	2016/03/22	ATL SOP 00197	Atl. RBCA v3 m
Metals Leach TCLP/CGSB extraction (3)	1	2016/03/30	2016/03/30	ATL SOP 00058	EPA 6020A R1 m
Metals Solids Acid Extr. ICPMS (3)	1	2016/03/21	2016/03/22	ATL SOP 00058	EPA 6020A R1 m
Moisture	1	N/A	2016/03/18	ATL SOP-00196	OMOE Handbook 1983 m
PAH in sediment by GC/MS (Low Level) (3, 4)	1	2016/03/22	2016/03/25	ATL SOP 00102	EPA 8270D 2007 m
Low Level PCB in Soil by GC-ECD (3)	1	2016/03/21	2016/03/22	ATL SOP 00106	EPA 8082A m
PCB Aroclor sum (low level soil) (3)	1	N/A	2016/03/22		Auto Calc.
pH (5:1 DI Water Extract) (3)	1	2016/03/18	2016/03/21	ATL SOP 00003	SM 22 4500-H+ B m
VPH in Soil (PIRI) (1)	1	2016/03/17	2016/03/21	ATL SOP 00199	Atl. RBCA v3 m
TCLP Inorganic extraction - pH (3)	1	N/A	2016/03/30	ATL SOP 00035	EPA 1311 m
TCLP Inorganic extraction - Weight (3)	1	N/A	2016/03/30	ATL SOP 00035	EPA 1311 m
ModTPH (T1) Calc. for Soil	1	N/A	2016/03/22	N/A	Atl. RBCA v3 m

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 Maxxam Analytics Mississauga

(2) Reported on a dry weight basis.

(3) This test was performed by Maxxam Bedford

(4) Soils are reported on a dry weight basis unless otherwise specified.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Heather Macumber, Project Manager

Email: HMacumber@maxxam.ca

Phone# (902)420-0203 Ext:226

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

RBCA HYDROCARBONS IN SOIL (SEDIMENT)

Maxxam ID		CAE455	CAE455		
Sampling Date		2016/03/13 12:00	2016/03/13 12:00		
COC Number		D06087	D06087		
	UNITS	BH5-MS1-OB	BH5-MS1-OB Lab-Dup	RDL	QC Batch
Inorganics					
Moisture	%	77	78	1.0	4421281
Petroleum Hydrocarbons					
Benzene	mg/kg	ND	ND	0.025	4421842
Toluene	mg/kg	ND	ND	0.025	4421842
Ethylbenzene	mg/kg	ND	ND	0.025	4421842
Total Xylenes	mg/kg	ND	ND	0.050	4421842
C6 - C10 (less BTEX)	mg/kg	ND	ND	2.5	4421842
>C10-C16 Hydrocarbons	mg/kg	ND	ND	10	4424059
>C16-C21 Hydrocarbons	mg/kg	ND	ND	10	4424059
>C21-<C32 Hydrocarbons	mg/kg	ND	ND	15	4424059
Modified TPH (Tier1)	mg/kg	ND		15	4426062
Reached Baseline at C32	mg/kg	Yes	Yes	N/A	4424059
Surrogate Recovery (%)					
Isobutylbenzene - Extractable	%	86 (1)	83 (1)		4424059
n-Dotriacontane - Extractable	%	119	114		4424059
Isobutylbenzene - Volatile	%	107	107		4421842
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate ND = Not detected N/A = Not Applicable (1) Triple silica gel cleanup was used to remove organic interferences from sample extract as per client request.					

Maxxam Job #: B651632
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Sampler Initials: FF

ATLANTIC TCLP LEACHATE + METALS (SEDIMENT)

Maxxam ID		CAE455		
Sampling Date		2016/03/13 12:00		
COC Number		D06087		
	UNITS	BH5-MS1-OB	RDL	QC Batch
Inorganics				
Sample Weight (as received)	g	100	N/A	4434870
Initial pH	N/A	4.9		4434874
Final pH	N/A	5.0		4434874
Metals				
Leachable Arsenic (As)	ug/L	ND	20	4436262
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				
N/A = Not Applicable				
ND = Not detected				

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Sampler Initials: FF

RESULTS OF ANALYSES OF SEDIMENT

Maxxam ID		CAE455		
Sampling Date		2016/03/13 12:00		
COC Number		D06087		
	UNITS	BH5-MS1-OB	RDL	QC Batch
Inorganics				
Free Cyanide	ug/g	0.04	0.02	4425143
Soluble (5:1) pH	pH	6.77	N/A	4425975
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable				

Maxxam Job #: B651632
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PCB'S AND DDT BY GC-ECD (SEDIMENT)

Maxxam ID		CAE455		
Sampling Date		2016/03/13 12:00		
COC Number		D06087		
	UNITS	BH5-MS1-OB	RDL	QC Batch
PCBs				
Aroclor 1016	mg/kg	ND	0.010	4425465
Aroclor 1221	mg/kg	ND	0.010	4425465
Aroclor 1232	mg/kg	ND	0.010	4425465
Aroclor 1248	mg/kg	ND	0.010	4425465
Aroclor 1242	mg/kg	ND	0.010	4425465
Aroclor 1254	mg/kg	ND	0.010	4425465
Aroclor 1260	mg/kg	ND	0.010	4425465
Calculated Total PCB	mg/kg	ND	0.010	4417940
Surrogate Recovery (%)				
Decachlorobiphenyl	%	102 (1)		4425465
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not detected (1) PCB:Unidentified (possibly halogenated) compounds detected.				

ELEMENTS BY ATOMIC SPECTROSCOPY (SEDIMENT)

Maxxam ID		CAE455		
Sampling Date		2016/03/13 12:00		
COC Number		D06087		
	UNITS	BH5-MS1-OB	RDL	QC Batch
Metals				
Acid Extractable Aluminum (Al)	mg/kg	15000	10	4425635
Acid Extractable Antimony (Sb)	mg/kg	ND	2.0	4425635
Acid Extractable Arsenic (As)	mg/kg	14	2.0	4425635
Acid Extractable Barium (Ba)	mg/kg	140	5.0	4425635
Acid Extractable Beryllium (Be)	mg/kg	ND	2.0	4425635
Acid Extractable Boron (B)	mg/kg	51	50	4425635
Acid Extractable Cadmium (Cd)	mg/kg	0.46	0.30	4425635
Acid Extractable Chromium (Cr)	mg/kg	30	2.0	4425635
Acid Extractable Cobalt (Co)	mg/kg	13	1.0	4425635
Acid Extractable Copper (Cu)	mg/kg	70	2.0	4425635
Acid Extractable Iron (Fe)	mg/kg	25000	50	4425635
Acid Extractable Lead (Pb)	mg/kg	34	0.50	4425635
Acid Extractable Manganese (Mn)	mg/kg	600	2.0	4425635
Acid Extractable Mercury (Hg)	mg/kg	0.11	0.10	4425635
Acid Extractable Molybdenum (Mo)	mg/kg	6.8	2.0	4425635
Acid Extractable Nickel (Ni)	mg/kg	24	2.0	4425635
Acid Extractable Selenium (Se)	mg/kg	ND	1.0	4425635
Acid Extractable Silver (Ag)	mg/kg	ND	0.50	4425635
Acid Extractable Strontium (Sr)	mg/kg	73	5.0	4425635
Acid Extractable Thallium (Tl)	mg/kg	0.13	0.10	4425635
Acid Extractable Tin (Sn)	mg/kg	5.0	2.0	4425635
Acid Extractable Uranium (U)	mg/kg	3.6	0.10	4425635
Acid Extractable Vanadium (V)	mg/kg	34	2.0	4425635
Acid Extractable Zinc (Zn)	mg/kg	100	5.0	4425635
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				
ND = Not detected				

SEMI-VOLATILE ORGANICS BY GC-MS (SEDIMENT)

Maxxam ID		CAE455		
Sampling Date		2016/03/13 12:00		
COC Number		D06087		
	UNITS	BH5-MS1-OB	RDL	QC Batch
Polyaromatic Hydrocarbons				
1-Methylnaphthalene	mg/kg	ND	0.0050	4426951
2-Methylnaphthalene	mg/kg	ND	0.0050	4426951
Acenaphthene	mg/kg	0.037	0.0050	4426951
Acenaphthylene	mg/kg	0.15	0.0050	4426951
Anthracene	mg/kg	0.77	0.0050	4426951
Benzo(a)anthracene	mg/kg	5.6	0.0050	4426951
Benzo(a)pyrene	mg/kg	3.1	0.0050	4426951
Benzo(b)fluoranthene	mg/kg	3.9	0.0050	4426951
Benzo(g,h,i)perylene	mg/kg	1.1	0.0050	4426951
Benzo(j)fluoranthene	mg/kg	1.9	0.0050	4426951
Benzo(k)fluoranthene	mg/kg	2.2	0.0050	4426951
Chrysene	mg/kg	5.8	0.0050	4426951
Dibenz(a,h)anthracene	mg/kg	0.30	0.0050	4426951
Fluoranthene	mg/kg	17	0.0050	4426951
Fluorene	mg/kg	0.089	0.0050	4426951
Indeno(1,2,3-cd)pyrene	mg/kg	0.98	0.0050	4426951
Naphthalene	mg/kg	ND	0.0050	4426951
Perylene	mg/kg	1.0	0.0050	4426951
Phenanthrene	mg/kg	0.52	0.0050	4426951
Pyrene	mg/kg	5.6	0.0050	4426951
Surrogate Recovery (%)				
D10-Anthracene	%	89		4426951
D14-Terphenyl	%	94		4426951
D8-Acenaphthylene	%	80		4426951
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not detected				



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GENERAL COMMENTS

Revised report - TCLP + As added to sample BH5-MS1-OB as per request from cathy martin. HM Mar 29/16

Results relate only to the items tested.

Maxxam Job #: B651632
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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4421281	ACL	RPD [CAE455-01]	Moisture	2016/03/18	0.39		%	25
4421842	MCT	Spiked Blank	Isobutylbenzene - Volatile	2016/03/21		98	%	60 - 130
			Benzene	2016/03/21		69	%	60 - 140
			Toluene	2016/03/21		66	%	60 - 140
			Ethylbenzene	2016/03/21		69	%	60 - 140
			Total Xylenes	2016/03/21		72	%	60 - 140
4421842	MCT	Method Blank	Isobutylbenzene - Volatile	2016/03/21		102	%	60 - 130
			Benzene	2016/03/21	ND, RDL=0.025		mg/kg	
			Toluene	2016/03/21	ND, RDL=0.025		mg/kg	
			Ethylbenzene	2016/03/21	ND, RDL=0.025		mg/kg	
			Total Xylenes	2016/03/21	ND, RDL=0.050		mg/kg	
			C6 - C10 (less BTEX)	2016/03/21	ND, RDL=2.5		mg/kg	
4421842	MCT	RPD [CAE455-01]	Benzene	2016/03/21	NC		%	50
			Toluene	2016/03/21	NC		%	50
			Ethylbenzene	2016/03/21	NC		%	50
			Total Xylenes	2016/03/21	NC		%	50
			C6 - C10 (less BTEX)	2016/03/21	NC		%	50
4424059	SPI	RPD [CAE455-01]	>C10-C16 Hydrocarbons	2016/03/22	NC		%	50
			>C16-C21 Hydrocarbons	2016/03/22	NC		%	50
			>C21-<C32 Hydrocarbons	2016/03/22	NC		%	50
4425143	XQI	Matrix Spike	Free Cyanide	2016/03/21		105	%	75 - 125
4425143	XQI	Spiked Blank	Free Cyanide	2016/03/21		98	%	80 - 120
4425143	XQI	Method Blank	Free Cyanide	2016/03/21	ND, RDL=0.01		ug/g	
4425143	XQI	RPD	Free Cyanide	2016/03/21	NC		%	35
4425465	LGE	Matrix Spike	Decachlorobiphenyl	2016/03/22		99	%	70 - 130
			Aroclor 1254	2016/03/22		97	%	30 - 130
4425465	LGE	Spiked Blank	Decachlorobiphenyl	2016/03/22		112	%	70 - 130
			Aroclor 1254	2016/03/22		110	%	30 - 130
4425465	LGE	Method Blank	Decachlorobiphenyl	2016/03/22		103	%	70 - 130
			Aroclor 1016	2016/03/22	ND, RDL=0.010		mg/kg	
			Aroclor 1221	2016/03/22	ND, RDL=0.010		mg/kg	
			Aroclor 1232	2016/03/22	ND, RDL=0.010		mg/kg	
			Aroclor 1248	2016/03/22	ND, RDL=0.010		mg/kg	
			Aroclor 1242	2016/03/22	ND, RDL=0.010		mg/kg	
			Aroclor 1254	2016/03/22	ND, RDL=0.010		mg/kg	
			Aroclor 1260	2016/03/22	ND, RDL=0.010		mg/kg	
4425465	LGE	RPD	Aroclor 1016	2016/03/22	NC		%	50

Maxxam Job #: B651632
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Public Works & Government Services Canada
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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC			Date		Value	Recovery	UNITS	QC Limits
Batch	Init	QC Type	Parameter	Analyzed				
4425635	BAN	Matrix Spike	Aroclor 1221	2016/03/22	NC		%	50
			Aroclor 1232	2016/03/22	NC		%	50
			Aroclor 1248	2016/03/22	NC		%	50
			Aroclor 1242	2016/03/22	NC		%	50
			Aroclor 1254	2016/03/22	NC		%	50
			Aroclor 1260	2016/03/22	NC		%	50
			Acid Extractable Antimony (Sb)	2016/03/22		89	%	75 - 125
			Acid Extractable Arsenic (As)	2016/03/22		94	%	75 - 125
			Acid Extractable Barium (Ba)	2016/03/22		NC	%	75 - 125
			Acid Extractable Beryllium (Be)	2016/03/22		92	%	75 - 125
			Acid Extractable Boron (B)	2016/03/22		86	%	75 - 125
			Acid Extractable Cadmium (Cd)	2016/03/22		95	%	75 - 125
			Acid Extractable Chromium (Cr)	2016/03/22		95	%	75 - 125
			Acid Extractable Cobalt (Co)	2016/03/22		95	%	75 - 125
			Acid Extractable Copper (Cu)	2016/03/22		96	%	75 - 125
			Acid Extractable Lead (Pb)	2016/03/22		92	%	75 - 125
			Acid Extractable Manganese (Mn)	2016/03/22		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2016/03/22		90	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2016/03/22		95	%	75 - 125
			Acid Extractable Nickel (Ni)	2016/03/22		98	%	75 - 125
			Acid Extractable Selenium (Se)	2016/03/22		96	%	75 - 125
			Acid Extractable Silver (Ag)	2016/03/22		96	%	75 - 125
			Acid Extractable Strontium (Sr)	2016/03/22		98	%	75 - 125
			Acid Extractable Thallium (Tl)	2016/03/22		96	%	75 - 125
			Acid Extractable Tin (Sn)	2016/03/22		97	%	75 - 125
			Acid Extractable Uranium (U)	2016/03/22		96	%	75 - 125
			Acid Extractable Vanadium (V)	2016/03/22		93	%	75 - 125
			Acid Extractable Zinc (Zn)	2016/03/22		NC	%	75 - 125
4425635	BAN	Spiked Blank	Acid Extractable Antimony (Sb)	2016/03/22		95	%	75 - 125
			Acid Extractable Arsenic (As)	2016/03/22		97	%	75 - 125
			Acid Extractable Barium (Ba)	2016/03/22		92	%	75 - 125
			Acid Extractable Beryllium (Be)	2016/03/22		89	%	75 - 125
			Acid Extractable Boron (B)	2016/03/22		86	%	75 - 125
			Acid Extractable Cadmium (Cd)	2016/03/22		96	%	75 - 125
			Acid Extractable Chromium (Cr)	2016/03/22		96	%	75 - 125
			Acid Extractable Cobalt (Co)	2016/03/22		96	%	75 - 125
			Acid Extractable Copper (Cu)	2016/03/22		96	%	75 - 125
			Acid Extractable Lead (Pb)	2016/03/22		94	%	75 - 125
			Acid Extractable Manganese (Mn)	2016/03/22		96	%	75 - 125
			Acid Extractable Mercury (Hg)	2016/03/22		97	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2016/03/22		94	%	75 - 125
			Acid Extractable Nickel (Ni)	2016/03/22		97	%	75 - 125
			Acid Extractable Selenium (Se)	2016/03/22		97	%	75 - 125
			Acid Extractable Silver (Ag)	2016/03/22		97	%	75 - 125
			Acid Extractable Strontium (Sr)	2016/03/22		99	%	75 - 125
			Acid Extractable Thallium (Tl)	2016/03/22		96	%	75 - 125
			Acid Extractable Tin (Sn)	2016/03/22		96	%	75 - 125
			Acid Extractable Uranium (U)	2016/03/22		97	%	75 - 125
			Acid Extractable Vanadium (V)	2016/03/22		94	%	75 - 125
			Acid Extractable Zinc (Zn)	2016/03/22		98	%	75 - 125

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4425635	BAN	Method Blank	Acid Extractable Aluminum (Al)	2016/03/22	ND, RDL=10		mg/kg	
			Acid Extractable Antimony (Sb)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Arsenic (As)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Barium (Ba)	2016/03/22	ND, RDL=5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Boron (B)	2016/03/22	ND, RDL=50		mg/kg	
			Acid Extractable Cadmium (Cd)	2016/03/22	ND, RDL=0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2016/03/22	ND, RDL=1.0		mg/kg	
			Acid Extractable Copper (Cu)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Iron (Fe)	2016/03/22	ND, RDL=50		mg/kg	
			Acid Extractable Lead (Pb)	2016/03/22	ND, RDL=0.50		mg/kg	
			Acid Extractable Manganese (Mn)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2016/03/22	ND, RDL=0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Selenium (Se)	2016/03/22	ND, RDL=1.0		mg/kg	
			Acid Extractable Silver (Ag)	2016/03/22	ND, RDL=0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2016/03/22	ND, RDL=5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2016/03/22	ND, RDL=0.10		mg/kg	
			Acid Extractable Tin (Sn)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Uranium (U)	2016/03/22	ND, RDL=0.10		mg/kg	
			Acid Extractable Vanadium (V)	2016/03/22	ND, RDL=2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2016/03/22	ND, RDL=5.0		mg/kg	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC			Parameter	Date	Value	Recovery	UNITS	QC Limits
Batch	Init	QC Type		Analyzed				
4425635	BAN	RPD	Acid Extractable Aluminum (Al)	2016/03/22	8.7		%	35
			Acid Extractable Antimony (Sb)	2016/03/22	NC		%	35
			Acid Extractable Arsenic (As)	2016/03/22	5.5		%	35
			Acid Extractable Barium (Ba)	2016/03/22	19		%	35
			Acid Extractable Beryllium (Be)	2016/03/22	NC		%	35
			Acid Extractable Boron (B)	2016/03/22	NC		%	35
			Acid Extractable Cadmium (Cd)	2016/03/22	NC		%	35
			Acid Extractable Chromium (Cr)	2016/03/22	6.8		%	35
			Acid Extractable Cobalt (Co)	2016/03/22	9.1		%	35
			Acid Extractable Copper (Cu)	2016/03/22	13		%	35
			Acid Extractable Iron (Fe)	2016/03/22	6.7		%	35
			Acid Extractable Lead (Pb)	2016/03/22	12		%	35
			Acid Extractable Manganese (Mn)	2016/03/22	18		%	35
			Acid Extractable Mercury (Hg)	2016/03/22	NC		%	35
			Acid Extractable Molybdenum (Mo)	2016/03/22	NC		%	35
			Acid Extractable Nickel (Ni)	2016/03/22	7.0		%	35
			Acid Extractable Selenium (Se)	2016/03/22	NC		%	35
			Acid Extractable Silver (Ag)	2016/03/22	NC		%	35
			Acid Extractable Strontium (Sr)	2016/03/22	NC		%	35
			Acid Extractable Thallium (Tl)	2016/03/22	NC		%	35
			Acid Extractable Tin (Sn)	2016/03/22	NC		%	35
			Acid Extractable Uranium (U)	2016/03/22	NC		%	35
			Acid Extractable Vanadium (V)	2016/03/22	13		%	35
			Acid Extractable Zinc (Zn)	2016/03/22	14		%	35
4426951	RST	Matrix Spike	D10-Anthracene	2016/03/25		89	%	30 - 130
			D14-Terphenyl	2016/03/25		81	%	30 - 130
			D8-Acenaphthylene	2016/03/25		78	%	30 - 130
			1-Methylnaphthalene	2016/03/25		87	%	30 - 130
			2-Methylnaphthalene	2016/03/25		97	%	30 - 130
			Acenaphthene	2016/03/25		99	%	30 - 130
			Acenaphthylene	2016/03/25		NC	%	30 - 130
			Anthracene	2016/03/25		NC	%	30 - 130
			Benzo(a)anthracene	2016/03/25		NC	%	30 - 130
			Benzo(a)pyrene	2016/03/25		NC	%	30 - 130
			Benzo(b)fluoranthene	2016/03/25		NC	%	30 - 130
			Benzo(g,h,i)perylene	2016/03/25		NC	%	30 - 130
			Benzo(j)fluoranthene	2016/03/25		NC	%	30 - 130
			Benzo(k)fluoranthene	2016/03/25		NC	%	30 - 130
			Chrysene	2016/03/25		NC	%	30 - 130
			Dibenz(a,h)anthracene	2016/03/25		NC	%	30 - 130
			Fluoranthene	2016/03/25		NC	%	30 - 130
			Fluorene	2016/03/25		NC	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2016/03/25		NC	%	30 - 130
			Naphthalene	2016/03/25		92	%	30 - 130
			Perylene	2016/03/25		NC	%	30 - 130
			Phenanthrene	2016/03/25		NC	%	30 - 130
			Pyrene	2016/03/25		NC	%	30 - 130
4426951	RST	Spiked Blank	D10-Anthracene	2016/03/25		84	%	30 - 130
			D14-Terphenyl	2016/03/25		88	%	30 - 130
			D8-Acenaphthylene	2016/03/25		82	%	30 - 130
			1-Methylnaphthalene	2016/03/25		87	%	30 - 130

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4426951	RST	Method Blank	2-Methylnaphthalene	2016/03/25		94	%	30 - 130
			Acenaphthene	2016/03/25		95	%	30 - 130
			Acenaphthylene	2016/03/25		101	%	30 - 130
			Anthracene	2016/03/25		110	%	30 - 130
			Benzo(a)anthracene	2016/03/25		104	%	30 - 130
			Benzo(a)pyrene	2016/03/25		87	%	30 - 130
			Benzo(b)fluoranthene	2016/03/25		87	%	30 - 130
			Benzo(g,h,i)perylene	2016/03/25		79	%	30 - 130
			Benzo(j)fluoranthene	2016/03/25		91	%	30 - 130
			Benzo(k)fluoranthene	2016/03/25		98	%	30 - 130
			Chrysene	2016/03/25		119	%	30 - 130
			Dibenz(a,h)anthracene	2016/03/25		69	%	30 - 130
			Fluoranthene	2016/03/25		115	%	30 - 130
			Fluorene	2016/03/25		104	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2016/03/25		71	%	30 - 130
			Naphthalene	2016/03/25		90	%	30 - 130
			Perylene	2016/03/25		88	%	30 - 130
			Phenanthrene	2016/03/25		113	%	30 - 130
			Pyrene	2016/03/25		108	%	30 - 130
			D10-Anthracene	2016/03/25		83	%	30 - 130
			D14-Terphenyl	2016/03/25		86	%	30 - 130
			D8-Acenaphthylene	2016/03/25		80	%	30 - 130
			1-Methylnaphthalene	2016/03/25	ND, RDL=0.0050		mg/kg	
			2-Methylnaphthalene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Acenaphthene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Acenaphthylene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Anthracene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Benzo(a)anthracene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Benzo(a)pyrene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Benzo(b)fluoranthene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Benzo(g,h,i)perylene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Benzo(j)fluoranthene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Benzo(k)fluoranthene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Chrysene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Dibenz(a,h)anthracene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Fluoranthene	2016/03/25	ND, RDL=0.0050		mg/kg	

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QA/QC				Date				
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4426951	RST	RPD	Fluorene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Indeno(1,2,3-cd)pyrene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Naphthalene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Perylene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Phenanthrene	2016/03/25	ND, RDL=0.0050		mg/kg	
			Pyrene	2016/03/25	ND, RDL=0.0050		mg/kg	
			1-Methylnaphthalene	2016/03/28	NC		%	50
			2-Methylnaphthalene	2016/03/28	NC		%	50
			Acenaphthene	2016/03/28	NC		%	50
			Acenaphthylene	2016/03/28	115 (1)		%	50
			Anthracene	2016/03/28	69 (1)		%	50
			Benzo(a)anthracene	2016/03/28	63 (2)		%	50
			Benzo(a)pyrene	2016/03/28	89 (1)		%	50
			Benzo(b)fluoranthene	2016/03/28	96 (1)		%	50
			Benzo(g,h,i)perylene	2016/03/28	90 (1)		%	50
			Benzo(j)fluoranthene	2016/03/28	97 (1)		%	50
			Benzo(k)fluoranthene	2016/03/28	87 (1)		%	50
			Chrysene	2016/03/28	53 (2)		%	50
			Dibenz(a,h)anthracene	2016/03/28	85 (1)		%	50
			Fluoranthene	2016/03/28	100 (2)		%	50
			Fluorene	2016/03/28	77 (1)		%	50
			Indeno(1,2,3-cd)pyrene	2016/03/28	88 (1)		%	50
			Naphthalene	2016/03/28	NC		%	50
			Perylene	2016/03/28	87 (1)		%	50
			Phenanthrene	2016/03/28	74 (1)		%	50
			Pyrene	2016/03/28	63 (1)		%	50
4434870	EDL	Method Blank	Sample Weight (as received)	2016/03/30	NA		g	
4436262	BAN	Matrix Spike	Leachable Arsenic (As)	2016/03/30		95	%	75 - 125
4436262	BAN	Spiked Blank	Leachable Arsenic (As)	2016/03/30		91	%	80 - 120

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4436262	BAN	Method Blank	Leachable Arsenic (As)	2016/03/30	ND, RDL=20		ug/L	
<p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>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.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.</p> <p>NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).</p> <p>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 (one or both samples < 5x RDL).</p> <p>(1) Duplicate: results are outside acceptance limit. Sample was past recommended hold time for repeat analysis.</p> <p>(2) Duplicate: results are outside acceptance limit. Sample was past recommended hold time for repeat analysis. Elevated PAH RDL(s) due to sample dilution.</p>								

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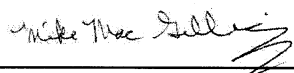
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VALIDATION SIGNATURE PAGE

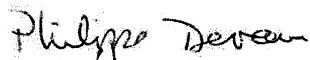
The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Cristina Carriere, Scientific Services



Mike MacGillivray, Scientific Specialist (Inorganics)



Phil Deveau



Rob Whelan, Laboratory Manager

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.