Marine Sediment and Water Quality Technical Data Report

Proposed Aurora LNG Project

November 2016

Prepared for:
Aurora LNG
Calgary, Alberta

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COMMUNITY COMMITMENT CONNECTION

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EXECUTIVE SUMMARY

Aurora LNG is proposing to construct and operate a liquefied natural gas (LNG) facility and marine terminal near Prince Rupert, British Columbia referred to as the Aurora LNG Project ("the Project"). The Project is undergoing a substituted environmental assessment. One of the valued components being assessed as part of the environmental assessment is Water Quality, which includes the sampling of marine sediment and water to assess the effects of dredging at the proposed marine terminal and material offloading facility (MOF) at Digby Island.

This document presents the results of two field programs carried out to characterize the water quality and sediment in the following three proposed dredge areas:

- Berths 1 & 2 (south of Frederick Point)
- MOF (in Casey Cove)

A preliminary field program was completed from December 15 to 19, 2014 (surface sediment and water samples). A detailed sediment investigation was completed from January 15 to February 3, 2016 (supplemental surface samples and shallow core [vibracore] samples). In sediment, physical parameters and potential contaminants of concern for disposal at sea (metals, polycyclic aromatic hydrocarbons [PAHs], polychlorinated biphenyls [PCBs], and dioxins and furans [PCDD/Fs]) were analyzed. In water, physical parameters (including total suspended solids [TSS] and turbidity), anions and nutrients, total metals, and chlorophyll *a* were analyzed.

A total of 192 sediment samples (plus 35 field duplicates) were collected across the three proposed dredge footprints, as follows:

- 28 surface samples (9 at Berth 1, 6 at Berth 2, and 13 at the MOF), 19 of which were analyzed for PCDD/Fs in addition to metals, PAHs, and PCBs
- 29 large (0.5 m) interval cores (10 at Berth 1, 6 at Berth 2, 13 at the MOF) for characterization of metals, PAHs, and PCBs
- 15 small (0.2 m) interval cores (5 at Berth 1, 4 at Berth 2, 6 at the MOF) for characterization of PCDD/Fs

The program was designed to collect large interval cores at 0.5 m intervals to 1.5 m depth (3 samples per core) and small interval core depths at 0.2 m intervals to 1.0 m (5 samples per core). However, cores were shallower at several sites due to encountering coarse substrates or bedrock.

After completion of the detailed sediment investigation program and further discussions with Environment Canada regarding results, additional deeper sediment samples (below 2.5 m depth) were collected as part of a marine geotechnical program in May 2016 and were analyzed for particle size distribution and metals.

Metals, PAHs, PCBs, and PCDD/Fs in sediments were compared to the Canadian Council of Ministers of the Environment (CCME) Interim Sediment Quality Guidelines (ISQGs) and Probable Effects Levels (PELs), as well as disposal at sea screening criteria. Water quality samples were compared to British Columbia Ministry of Environment (BC MOE) Approved and Working Marine Water Quality Guidelines for the Protection of Aquatic Life.

In sediment samples, concentrations of all metals except for arsenic and copper were below CCME ISQGs and disposal at sea criteria. Elevated arsenic and copper are consistent with other sediment metal data in the Prince Rupert area, and are indicative of naturally elevated levels of these metals in soils of the Skeena watershed. No metals exceeded CCME PELs. PAHs were frequently below detection limits, with no samples exceeding disposal at sea criteria for total PAHs. Several shallow samples (surface sample and 0 to 0.5 m intervals in core samples) had individual CCME ISQG PAH exceedances at Berth 1 and the MOF, but no samples exceeded CCME PELs. PCBs were below detection limits in all samples and were below CCME ISQGs, PELs and disposal at sea screening criteria for total PCBs.

PCDD/F concentrations are presented as total toxic equivalency (TEQ) values. Concentrations were higher than CCME ISQGs in the following number of samples:

- 7 of 30 samples from Berth 1
- 3 of 21 samples from Berth 2
- 7 of 30 samples from the MOF.

The maximum concentration was 2.86 pg/g TEQ, which is over three times higher than the ISQG (0.85 pg/g), but well below the 10-fold safety factor incorporated in the guideline and well below the PEL (21.5 pg/g). Concentrations were highest in surface samples and the shallowest core samples (0-0.2 m intervals). Draft interim guidance from Environment and Climate Change Canada (ECCC) for assessing the risk for disposal at sea of sediments containing PCDD/Fs recommends using 95% upper confidence limits (UCLs) to further assess suitability of sediments for disposal at sea. The 95% UCL TEQs were compared to an ECCC lower action level (LAL) of 9 pg/g TEQ. For all samples, 95% UCL TEQs were below the LAL. A volume weighted calculation to determine PCDD/F concentrations in the overall dredge volume for each proposed dredge site was below the ECCC overall management objective (OMO) of 0.85 pg/g TEQ (overall volume weighted TEQs were 0.306 pg/g TEQ at Berth 1, 0.484 pg/g TEQ at Berth 2, and 0.246 pg/g TEQ at the MOF).

As per ECCC criteria for ocean disposal, the sediments from the three proposed Project dredge footprints are chemically suitable for open-water disposal at a non-dispersive site.

In the event of potential disposal on land, sediment chemistry was compared to BC Contaminated Sites Regulation (CSR) Schedule 7 standards (Standards Triggering Contaminated Soil Relocation Agreements) and BC MOE Technical Guidance 20 for “Applicability of Sodium and Chloride Ion Soil Relocation Standards to Dredged Marine and Estuarine Materials.” Available data met CSR Schedule 7, Column II standards to potentially dispose of dredged sediment on non-agricultural land, with the exception of chloride and sodium data. Conditions of BC MOE Technical Guidance 20 allow sediments with elevated concentrations of chloride and sodium to be disposed of on near-shore sites without a Contaminated Soil Relocation Agreement (CSRA).

As part of the marine geotechnical characterization of the study area, marine borehole samples were collected within or near the proposed dredge footprint in May 2016. Ten archived marine borehole samples (three from Berth 1, collected from 3.05 to 4.57 m below mudline; seven from the MOF, collected from 1.98 to 6.1 m below mudline) were analyzed for particle size distribution, with five of those samples also analyzed for metals. No borehole samples from Berth 2 were analyzed due to a lack sample recovery below 2.5 m depth. Berth 1 samples and shallower MOF samples were predominantly sand (similar to sediments from the surface 2.5 m), while deeper MOF samples (3.05 to 6.1 m below mudline) were mostly silt and sand (finer sediment than in the surface 2.5 m). Berth 1 samples were below marine sediment screening criteria

for metals. In the MOF, copper exceeded the disposal at sea screening criterion and the CCME ISQG in three samples (consistent with data for shallower depths).

Water quality parameters were below water quality guidelines except copper and boron. Copper exceeded the BC MOE average guideline (0.002 mg/L) in one sample (0.00258 mg/L). Boron concentrations ranged from 3.36 to 4.19 mg/L, compared to a BC MOE maximum guideline: 1.2 mg/L), concentrations are similar in nearby Prince Rupert Port Authority (PRPA) monitored sites. TSS and turbidity were low or below detection limits during field studies, also similar to PRPA monitoring data.

ACRONYMS AND ABBREVIATIONS

ANOVA	analysis of variance
BC MOE	British Columbia Ministry of Environment
BC	British Columbia
CCME	Canadian Council of Ministers of the Environment
CSR	Contaminated Sites Regulation
CSRA	Contaminated Soil Relocation Agreement
DFO	Fisheries and Oceans Canada
DQO	data quality objective
EC	Environment Canada
ECCC	Environment and Climate Change Canada
ISQG	interim sediment quality guideline
LAL	lower action level
LNG	liquefied natural gas
MOF	material offloading facility
OMO	overall management objective
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCDD	polychlorinated dibenzodioxin
PCDF	polychlorinated dibenzofuran
PCL	primary core large
PCS	primary core small
PEL	probable effects level
PRPA	Prince Rupert Port Authority
QA/QC	quality assurance/quality control
RPD	relative percent difference
TDS	total dissolved solids
TEF	toxic equivalency factor
TEQ	toxic equivalency
the Project	the Aurora LNG Project
TOC	total organic carbon
TSS	total suspended solids
UCL	upper confidence limit
USEPA	United States Environmental Protection Agency
WHO	World Health Organization
WWII	World War II

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1 INTRODUCTION

Aurora LNG is proposing to construct and operate a liquefied natural gas (LNG) facility and marine terminal at Digby Island, near Prince Rupert, British Columbia (BC), referred to as the Aurora LNG Project ("the Project"). Natural gas from northeast BC will be converted into LNG for shipment by LNG carriers to markets in Asia, where it will be regasified and distributed. To facilitate safe manoeuvring and berthing of vessels, capital dredging of marine sediment and rock will be required at two berth areas, located south of Frederick Point, and at the Materials Off-loading Facility (MOF), located in Casey Cove. Dredging will occur to -15 m chart datum in all three dredge areas.

The Project is undergoing a substituted environmental assessment under the *BC Environmental Assessment Act*. One of the valued components being assessed for the environmental assessment is Water Quality, which includes the sampling of marine sediment and water to assess the potential effects of dredging.

Information on existing chemical and physical characteristics of sediment within the proposed dredge areas for the Project is required to assess potential environmental effects of dredging on marine fish and fish habitat and human health, and to inform dredgeate management and permitting requirements.

At the request of Aurora LNG, Stantec carried out two field programs to characterize water and sediment quality in the proposed dredge areas. The first program, conducted in December 2014, was a preliminary investigation to collect and analyze surface sediments and water samples. This initial field program was intended to provide preliminary chemical and physical characterization of sediments to inform a subsequent, comprehensive sediment investigation. The second program was a detailed characterization of marine sediments, including shallow cores in the proposed dredge footprints. The data presented herein will be used to support the assessment of potential project effects on water quality, and to evaluate management options for dredged sediment. If sediment is deemed suitable for disposal at sea, this information will also be used to prepare an application for ocean disposal of dredged material under the *Canadian Environmental Protection Act, 1999*.

2 STUDY AREAS

The study area falls within the proposed dredge footprints off the south end of Digby Island (see Figure 1) and in Casey Cove, on the east side of Digby Island (see Figure 2).

Aurora LNG is currently considering two options for the material offloading facility (MOF) in Casey Cove: a pile-and-deck option and a concrete caisson option. Based on preliminary Project engineering and design information, it is estimated that dredging associated with the pile-and-deck MOF option would involve the removal of 365,000 m^3 of sediment, while dredging for the concrete caisson MOF option would involve the removal of 314,000 m^3 of sediment. For the purposes of characterizing the physical and chemical composition of marine sediment, the marine sediment sampling program was designed using the larger dredge volume associated with the pile-and-deck MOF option. The final selection of MOF design will be made during detailed Project engineering.

3 DREDGE SITE HISTORY

3.1 Factors Influencing Load Site Material Quality

The proposed marine terminal is located on private and provincial crown land (private land is owned by Aurora LNG). There are two small communities on Digby Island, Dodge Cove and Crippen Cove, which lie on private lots on the east side of the island. The Prince Rupert Airport lies on the northwestern portion of Digby Island, approximately 2 km from Casey Cove and 5 km from the proposed marine berths. The northern portion of Digby Island is a Metlakatla First Nation Reserve. There are no other known current land uses on Digby Island near the proposed dredge footprints.

The services of a third party, Environmental Risk Information Services (ERIS; www.eris.ca), were retained to compile a comprehensive list of present and historical site uses, events at or near the dredge sites that may have impacted site quality (such as recent or historical spills), and current and historical industrial processes at or near the site. ERIS conducted a search of 43 relevant provincial, federal, and private databases, including the wastewater discharge inventory, federal contaminated sites inventory, national environmental emergencies system database for spills of hazardous substances, and the national pollutant release inventory. The search boundary included Digby Island and the entire jurisdiction of the Prince Rupert Port Authority (PRPA, to encompass areas of known current and historical industrial activity on Ridley Island and in Porpoise Harbour. The results are summarized in Table 1-1 and Table 1-2 (see Appendix 1), with relevant search results included in Table 1 and on Figure 3.

Current and historical industrial and human uses of the area, including sites identified in the ERIS database search, additional Fisheries and Oceans Canada (DFO) information on historical dump sites (Johannessen et al. 2007; Canadian Hydrographic Service [CHS] 1995), and discharge points and sewer outfall locations provided by the PRPA, are displayed on Figure 3. Three historical dump sites were identified in the area (see Figure 3). Sites at Philips Point (1,000-1,500 m^3 log storage waste) and Porpoise Harbour (5,000 m^3 of non-floatable dredge material from routine dredging at the Watson Island pulp mill) were identified in Johannessen et al. (2007). Casey Cove is also thought to have been used as a waste dumping site during World War II (WWII), based on a review of the nautical chart for the area (CHS 1995) and anecdotal reports from mariners of submerged debris. Known historical spills in the area, outside of the ERIS database search, are limited to a more recent release of an unknown volume of weak black liquor (a solution of water, lignin residues, hemicellulose, and inorganic chemicals [sodium hydroxide and sodium sulphide] resulting from the kraft chemical pulping process) from the Watson Island pulp mill into Porpoise Harbour in January 2012 (Environment and Climate Change Canada [ECCC] 2014a).

Historical use of Digby Island is also known to have included military activity. Frederick Point was the location of an important defensive fort during WWII, which included gun emplacements, searchlight positions, a munitions magazine, and numerous support structures and concrete bunkers (Department of National Defense 1986). While military activity at Frederick Point is assumed to have been largely land-based, with minimal potential for introduction of contaminants to the marine environment, remnants of a corduroy and gravel road link the site to a former marine station at Casey Cove. The marine station was built in the early 1900s to serve as the northern marine base servicing lighthouses and aids to navigation in the Prince Rupert Harbour, and was expanded during WWII. Currently, seven buildings remain intact at the site, including the carpenter shop, machine shop, a stores building, an office building, two miscellaneous

buildings, and one dilapidated house, in addition to a deteriorating wharf constructed of rebar and concrete that extends north into Casey Cove (Stantec 2015).

Table 1 Potential Contaminant Sources and Human Activity in the Prince Rupert Port Authority

Facility Types	Activity/Facility Name	Activity Timing	Potential Contaminants
Oil refineries	None known		
Mills	Skeena Cellulose Pulp Mill, including the historical effluent line across Ridley Island	Historical (1950s to 2001; spill in 2012)	Sulphites, Dioxins and Furans, weak black liquor
Mines	None known		
Sewage Outfalls	Various	Operating	Organic matter, Metals, Bacteria
Storm Drains/ Pipes	Various	Operating	PAH, Metals, Bacteria
Shipping Docks	CN railway and AquaTrain	Operating	Hydrocarbons
	Fairview Container Terminal	Operating	Hydrocarbons, PAH, PCB, Metals
	Prince Rupert Grain Terminal	Operating	Hydrocarbons
	Ridley Terminals Inc.	Operating	Hydrocarbons, PAH, PCB, Metals
	Westview Wood Pellet Terminal	Operating	Hydrocarbons
Other Industries	Aero Trading Co. Ltd fish plant, Port Edward	Operating	Organic matter
	Alaska/BC Ferries Terminal	Operating	Hydrocarbons
	Atlin Terminal (cruise ships and yachts)	Operating	Hydrocarbons
	Canfisco Prince Rupert and Seal Cove fish processing plants	Operating	Organic matter
	Digby Island Ferry Dock	Operating	Hydrocarbons
	Fuel docks (various)	Operating and Historical	Hydrocarbons
	Lightering Dock	Operating	Hydrocarbons
	Northland Cruise Terminal	Operating	Hydrocarbons
	North Pacific Cannery	Historical (1889-1981)	Hydrocarbons, Metals
	Ocean Dock (cruise ships and small vessels)	Historical (dates unknown)	Hydrocarbons
	Port Edward Small Craft Harbour	Operating	Hydrocarbons
	Prince Rupert Rowing and Yacht Club	Operating	Hydrocarbons
Other Industries (cont'd)	Ridley Island and Port Edward log sorting facilities	Historical (dates unknown)	Possibly dioxins and furans associated with wood preservatives
	Rushbrook Marina	Operating	Hydrocarbons
	Seaplane Terminal	Operating	Hydrocarbons

Table 1 Potential Contaminant Sources and Human Activity in the Prince Rupert Port Authority

Facility Types	Activity/Facility Name		Activity Timing	Potential Contaminants
Other Sources of Pollution and Contamination	ERIS Search Results	Navigational light (Southwest of Lelu Island)	Historical (dates unknown)	Possible lead-based paint and debris: Metals, PAH, Hydrocarbons
		Port Edward (DFO historical review[a])	Historical (dates unknown)	Potentially contaminated sediments: Metals, PAH, Hydrocarbons
		Navigational light (Porpoise Harbour Entrance Range Front)	Historical (dates unknown)	Possible lead-based paint and submerged off-shore batteries: Metals
		Prince Rupert Canadian Coast Guard Search and Rescue Station, Fairview	Historical (dates unknown)	Submerged off-shore batteries and possible creosote compounds from timber batteries: Metals, PAHs, Hydrocarbons
		Prince Rupert, Cow Bay (DFO historical review[a])	Historical (dates unknown)	Potentially contaminated sediments: Metals, PAH, Hydrocarbons
		Prince Rupert, Rushbrook (DFO historical review[a])	Historical (dates unknown)	Potentially contaminated sediments: Metals, PAH, Hydrocarbons
	Marine Station at Casey Cove		Historical (1900-WWII)	Hydrocarbons, Metals

NOTE:

[a] Contaminated Sites on Federal Land Inventory indicates a DFO historical review in the area that concluded there is potential for contaminated sediments or soils, with no additional details provided.

Previous dredging or disposal activities are not known to have occurred at the proposed dredge sites. The closest known dredging activity was associated with the northern expansion of the Fairview container terminal on Kaien Island, 1.5 km across the harbour from Casey Cove, which occurred in late 2015. Approximately 6,500 m^3 of dredged material from the Fairview site was disposed of on land (on Ridley Island), not at sea (Smith 2016, pers. comm.). Additional development projects that fall within the PRPA boundaries and that include a proposed dredging component include the Canpotex potash export terminal on Ridley Island (dredge volume of up to 411,000 m^3 permitted for ocean disposal beside nearby Coast Island, which does not include the volume constituting the upper 40 cm of the dredge cut [Disposal at Sea Permit No. 4543-2-03597 issued by EC on October 9, 2014 under the *Canadian Environmental Protection Act, 1999* (ECCC 2014b)]). However, based on information received during the Project environmental assessment, the Canpotex project is considered cancelled. The Pacific NorthWest LNG Project on Lelu Island proposes a dredge volume of approximately 200,000 m^3, of which approximately 192,000 m^3 is proposed for ocean disposal at Brown Passage and 8,000 m^3 is to be disposed of on Lelu Island (CEAA 2016). The Fairview Container Terminal Expansion Phase II proposes dredging of 6,500 m^3 of material for the northern expansion, with disposal on land, and dredging of 180,000 m3 of material for the southern expansion, with disposal at sea proposed for Brown Passage. The Westcoast Connector Gas Transmission Project proposes dredging of 280,000 m^3 of material from off the southwest shore of Ridley Island, with

potential disposal at sea. The previously used disposal site closest to the project is located at Brown Passage (54.30800 N, -130.75833 W), approximately 30 km northwest of the Project site.

Site-specific information on sedimentation rates at the proposed dredge sites is not available; however, there is limited information on sedimentation rates in the nearby area. Based on sedimentation rates off Ridley and Lelu Islands, discharge from the Skeena River is estimated to result in a maximum sediment deposition of 1 cm/yr at the Aurora LNG Project site (Fissel, 2015 pers. comm.). This estimated rate does not take into account other site-specific sediment transport processes for which information does not exist. To understand the coastal hydrodynamic processes and potential changes of sediment transport and deposition due to Project construction, a hydrodynamic model is currently being developed.

3.2 Ecologically Important Areas

Marine waters in the proposed berth and MOF areas support a range of intertidal and subtidal plant and animal species typical of the Prince Rupert area, including eelgrass, kelp, invertebrates, and fish such as salmon, rockfish, and flatfish (Stantec 2016a). Marine mammals likely present in the area include harbour porpoise, humpback whales, killer whales and habour seals (Stantec 2016b). Ecologically important areas in and around the PRPA jurisdiction are shown on Figure 4. This figure displays relevant data assembled from publicly available sources (including DFO, British Columbia Marine Conservation Analysis, and GeoBC CRIMS Data) and data collected by Stantec on behalf of the Aurora LNG Project through intertidal and subtidal surveys.

The MOF in Casey Cove and the marine berth dredge areas south of Digby Island fall within Important Areas for Dungeness crab and Tanner crab, as delineated by DFO (see Figure 4), which cover most of the PRPA jurisdiction. Eelgrass biobands and eelgrass patches have been noted around Digby Island (see Figure 4). Bull kelp patches are expected to be encountered at the southernmost marine berth (see Figure 4, Inset 2). All proposed dredge areas are well removed from Important Areas for shrimp (to the southwest of Digby Island) and eulachon (to the southeast).

4 METHODS

A preliminary field investigation of sediment and water quality was conducted during a five-day field program from December 15 to 19, 2014, with a detailed sediment investigation completed over 16 field days from January 15 to February 3, 2016. A work plan developed to guide the detailed sediment investigation was submitted to ECCC for review and comment prior to implementation of the field program.

As per ECCC disposal at sea minimum sample collection requirements (ECCC 2013; Appendix 2), sample location numbers required for characterization of sediment within the proposed dredge footprint (based on proposed soft (sediment) dredge volumes) are presented in Table 2.

Table 2 Study Area Dredge Volumes and Minimum Sample Requirements

Area	Dredge Area (m^2)	Soft (Sediment) Dredge Volume (m^3)	Hard (Rock) Dredge Volume (m^3)	Total Dredge Volume (m^3)	Sediment Sample Sites Required[a]	Actual Sample Sites Collected[b]
MOF	102,196	365,000	0	365,000	25	26
Berth 1 North	16,962	51,680	7,160	58,840	19	19
Berth 1 South	22,014	66,790	0	66,790		
Berth 1 Total	38,976	118,470	7,160	125,630		
Berth 2	15,340	42,930	18,640	61,570	11	12

NOTES:

[a] ECCC 2013

[b] Due to a realignment of the footprint (February 19, 2016), two sites fall outside of the Berth 1 footprint (BA01 = 5 m outside; PCS02 = 6 m outside), four sites fall outside of the Berth 2 footprint (BB01 = 11 m outside; BB03 = 17 m outside; SS05 = 4 m outside; PCS19 = 15 m outside), and one site falls outside of the MOF footprint (PCS21 = 122 m outside). All sites, however, are included in the data summary herein.

Sediment samples were collected using surface grab and shallow coring methods to provide characterization of the proposed dredge areas spatially and with depth. A summary of sediment samples collected during both programs is provided in Table 3.

Table 3 Summary of Sediment Sampling Programs

Area	Collection Program	Sample Type	Number of Sample Sites[a]	Number of Samples Collected for Analysis	Number of Duplicate Samples Collected
Berth 1	Preliminary (2014)	Surface Grab	6	6	1
		Vibracores	0	0	0
	Detailed (2016)	Surface Grab	3	3	1
		Vibracores - Large Interval (up to 5 samples per core)	10	35	4 (1 site)
		Vibracores - Small Interval (up to 7 samples per core)[b]	5	24	5 (1 site)
	Total		19	68	11
Berth 2	Preliminary (2014)	Surface Grab	3	3	1
		Vibracores	0	0	0
	Detailed (2016)	Surface Grab	3	3	0
		Vibracores - Large Interval (up to 5 samples per core)	6	16	3 (1 site)
		Vibracores - Small Interval (up to 7 samples per core)[b]	4	16	3 (1 site)
	Total		12	38	7
MOF	Preliminary (2014)	Surface Grab	3	3	1
		Vibracores	0	0	0
	Detailed (2016)	Surface Grab	10	10	1
		Vibracores - Large Interval (up to 5 samples per core)	13	51	10 (2 sites)
		Vibracores - Small Interval (up to 7 samples per core)[b]	6	22	5 (1 site)
	Total		26	86	17
Total for all Areas[b]			**57**	**192**	**35**

NOTES:

[a] Due to a realignment of the footprint (February 19, 2016), two sites fall outside of the Berth 1 footprint (BA01 = 5 m outside; PCS02 = 6 m outside), four sites fall outside of the Berth 2 footprint (BB01 = 11 m outside; BB03 = 17 m outside; SS05 = 4 m outside; PCS19 = 15 m outside), and one site falls outside of the MOF footprint (PCS21 = 122 m outside). All sites, however, are included in the summary of the data.

[b] Small interval vibracore samples are not included in sample site totals by area as each location was paired with a large interval core sample site.

Contaminants of potential concern and physical parameters in sediment selected for analysis were largely dictated by the Disposal at Sea Regulations (SOR/2001-275), which specify sediments proposed for ocean disposal be analyzed for a suite of metals (cadmium, lead, and mercury); polycyclic aromatic hydrocarbons (PAHs); polychlorinated biphenyls (PCBs); total organic carbon (TOC); percent moisture; and detailed particle size distribution. Sediment samples were also analyzed for additional metals required for disposal at sea permitting in BC (arsenic, chromium, copper, and zinc), and dioxins and furans (PCDD/Fs), given the historical pulp mill discharges in the Prince Rupert area and precedent for analysis of this contaminant for ocean disposal characterization required by ECCC for other projects in the vicinity. A review of historical information influencing load site material quality (see Section 3.1) confirmed this list of contaminants of potential concern is complete.

During the preliminary field program, *in situ* water quality conditions were measured and seawater samples were collected and analyzed for various physical tests (conductivity, hardness, pH, salinity, TSS, and turbidity), anions and nutrients, total metals, and chlorophyll *a*. Water quality samples were collected at three sites in the preliminary field program (see Table 3-1, Appendix 3, and in Figure 5). Background water quality data are supplemented with data collected quarterly by the PRPA (see Section 5.7) at nearby sites (see Table 3-2, Appendix 3, and Figure 5). Water samples were not collected during the detailed sediment investigation.

Data collected in 2014 from an area off Miller Point that was previously considered for Project infrastructure (three surface sediment samples plus one duplicate and data from a one-time sampling event at one water quality sampling station) are omitted from the data summarized herein because they fall outside of the proposed dredge footprint.

As part of the marine geotechnical investigation of the area, boreholes were collected within or near the dredge footprints in May 2016. Analysis of some of the deeper marine borehole samples was conducted in October 2016. Results are included in Appendix 8 and summarized in this report.

4.1 Sediment Sampling

During the preliminary field program, the Lax Kw'alaams Band provided a 9.75 m aluminum research vessel equipped with a winch (the M/V Bounty Hunter) and two crew members. This vessel and crew facilitated the sampling program conducted by two Stantec scientists and a technician from the Metlakatla First Nation.

For the detailed sediment investigation program, Rocky Mountain Soil Sampling Inc. (Bowen Island, BC) was subcontracted to facilitate vibracore sampling with their 8.5 m aluminum landing craft vessel (M/V Plan B), equipped with an A-frame and winch. Two Stantec scientists, three Rocky Mountain Soil Sampling crew members, and a Metlakatla First Nation technician conducted the detailed sediment sampling work.

Between the preliminary and detailed programs, 28 sediment samples (and three field duplicates) were collected using a standard ponar or shipek grab: 12 in the preliminary program and 16 in the detailed program. During the detailed program, 44 shallow cores were collected using a 10 cm diameter vibracore (with field duplicates taken from seven cores). Sediment sampling sites, dates, and sampling devices are presented in Table 3-3 in Appendix 3.

During surface sediment sample recovery in the preliminary program, multiple grabs had to be consolidated in many cases to collect sufficient fine sediment sample volume at a given site. Surface sediment samples during the detailed program were considered sufficient if the sampling grab retained at least 25% of its

capacity. In many cases, several attempts were made to retrieve sufficient sediment volume (with volumes <25% not retained for sample analysis). The shipek sampler was deployed during the detailed investigation program at sampling sites with strong currents and/or suspected rocky substrates to increase the likelihood of success. Photo 1 shows a surface sample grab collected with the shipek sampler at site SS04.

Photo 1 **Surface Grab Sample Collection with a Shipek Sampler (Site SS04 at Berth 2)**

Deeper core sample (vibracore) recoveries were seldom successful upon first attempt due to suspected rocky substrates, steep seafloor inclines, and poor weather conditions. After successful site drilling, cores were brought on board and divided into one of two intervals: 0.5 m for large interval sites (primary cores – large; PCL), or 0.2 m for detailed interval sites (primary cores – small; PCS). Vibracore drive depths were targeted to 2.5 m for PCL sites, and 1.4 m for PCS sites; however, drive refusal frequently occurred at shallower depths. The longest possible drive attempts were retained at each site. Attempts were made to geographically pair PCS sites with PCL sites but in several cases, poor recovery prevented close pairing of sites. At all successful core sites, samples for analysis (and duplicate samples when applicable) were collected from within each interval. Photo 2 and Photo 3 show the vibracore post-core collection, in preparation for sample processing, with the A-frame used to lower the vibracore to the sea-floor captured in Photo 3.

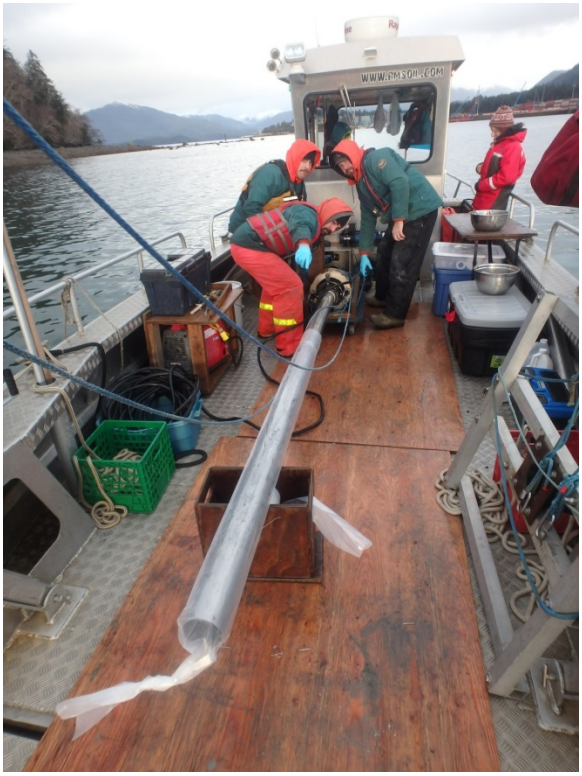

Photo 2 **Vibracore Drilling System used to Collect Shallow Core Samples**

Photo 3 **Vibracore Drilling System used to Collect Shallow Core Samples, with A-frame used for Maneuvering Vibracore System**

After surface sample or vibracore sample recovery, sediment samples were homogenized by hand mixing thoroughly in a clean stainless steel bowl. Observations of texture, colour, organic content, and odour were made prior to sample processing, and photos were taken of each sample pre- and post-homogenization (see Table 3-3 in Appendix 3). Photo 4 shows core sample PCL11 (0.5-1.0 m interval) in preparation for homogenization. Photo 5 shows a sample post-homogenization, ready to be separated into sample jars.

Post-homogenization, sediment was placed into pre-cleaned 120 mL glass jars and plastic bags provided by the laboratory. Three jars were filled (no headspace) for each sample to satisfy laboratory requirements for the requested analyses. A bag of sediment was also collected for salinity paste analysis. All samples were transported on ice in a cooler at less than 4°C and shipped by air under chain of custody to the ALS Environmental (ALS) analytical laboratory (Burnaby, BC) within specified holding times for analysis.

Figure 6 shows a summary of sample types and associated analyses. For surface grabs, 9 of 28 samples were analyzed for detailed particle size, metals, moisture, TOC, salinity, PAHs, and PCBs. The remaining 19 surface samples were also analyzed for PCDD/Fs. For PCL sites, samples within the top 1.5 m were initially analyzed for detailed particle size, metals, moisture, TOC, salinity, PAHs, and PCBs. At PCS sites, samples within the top 1.0 m were initially analyzed for moisture, detailed particle size, TOC, and PCDD/Fs. Remaining deeper intervals from both PCL and PCS cores were archived. In cases where the deepest analyzed sample exceeded guidelines (see Section 5.3 for details), archived samples were analyzed to assess to what depth guideline exceedances occurred. Due to multiple failed vibracore drive attempts and concern about poor recovery in the area, only one sample in the MOF (PCS21 – collected only to a depth of 0.2 m) was analyzed for moisture, detailed particle size, TOC, and PCDD/Fs as well as metals, PAHs, and PCBs. This sample did not exceed guidelines in any analyzed metals, PAHs, PCBs, or PCDD/Fs (see Table 6-1, Appendix 6) and, therefore, is not included in summary statistics for the MOF.

Photo 4 **Core Sample Collection and Observation prior to Homogenization (PCL11 0.5-1.0 m interval)**

Photo 5 **Homogenization of Core Sample Interval (PCS01 1.0-1.2 m interval)**

Excess sediment remaining in the sampling devices that was not required for analysis was returned to the ocean in the vicinity of the collection location. Liquids used for decontamination of equipment (acetone, Alconox, and deionized water) were left to evaporate or soaked up with paper towel and placed in a garbage bag on board for disposal on land at the conclusion of the field day.

Following completion of the detailed sediment investigation field program, advancements in engineering design of the Project components resulted in minor realignments of the proposed dredge footprints. Two sites in Berth 1 (BA01, PCS02), four sites in Berth 2 (SS05, BB01, PCS19, and BB03), and one site in the MOF (PCS21) now fall outside of the proposed dredge boundaries (within 4 to 17 m for the proposed Berths 1 and 2 dredge footprints, and within 122 m for site PCS21 outside of the proposed MOF dredge footprint). These samples are close enough to the revised dredge that they are considered to be representative of the sediment characteristics in and around the dredge footprints and, thus, are summarized with all other field-collected data.

4.2 Water Sampling

Water quality monitoring occurred at three locations, close to the areas where sediment samples were collected at each of the proposed dredge footprints (see Figure 5).

Seawater samples were collected from just below the surface (1 m) and from depth (1 to 2 m off bottom) during both ebbing and flooding tidal conditions at each site using a Kemmerer sampler (12 samples total). Samples were placed in appropriate lab-provided bottles (plastic or amber glass) and preserved with acid if necessary for the designated analysis. All samples were packed in a cooler with ice (temperature less than 4°C) and shipped under chain of custody to the ALS laboratory (Burnaby, BC) within specified analytical holding times. Analyses were conducted for physical tests (conductivity, hardness, pH, salinity, TSS, and turbidity), anions and nutrients, total metals, and chlorophyll *a*. A travel blank was included with one sample shipment as part of the quality assurance/quality control (QA/QC) program.

In situ water quality measurements were collected throughout the water column at each site in 1 to 2 m intervals using a YSI ProPlus multiparameter meter rented from and calibrated by Pine Environmental Services (Burnaby, BC). The meter was also calibrated in the field prior to taking measurements. Parameters of interest were salinity, dissolved oxygen, temperature, conductivity, total dissolved solids, and pH. *In situ* measurements were collected at 1 m intervals to 3 m depth (the length of the YSI cable), after which depth samples were collected using the Kemmerer sampler and readings were taken on the boat. Turbidity was measured using a LaMotte 2020e Turbidity meter rented from Pine Environmental Services, with water collected in the Kemmerer sampler. In addition, Secchi depth was recorded during each sampling event as a measure of water clarity.

Seawater sample transfer from the Kemmerer sampler to the collection bottle (site WQ_BB, flooding tide) and *in situ* water quality data collection (site WQ_BB, ebbing tide) are shown in Photo 6 and Photo 7, respectively.

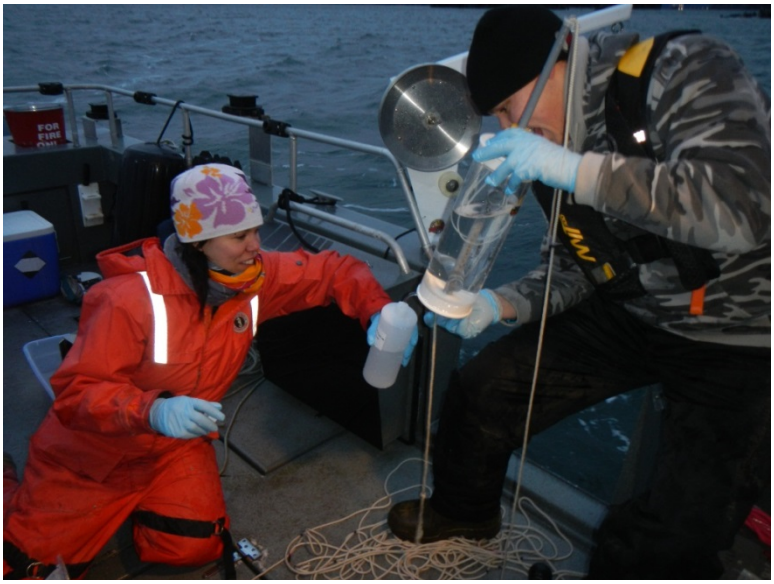

Photo 6 **Seawater Sample Collection (Site WQ_BB, at Berth 2, on Flooding Tide)**

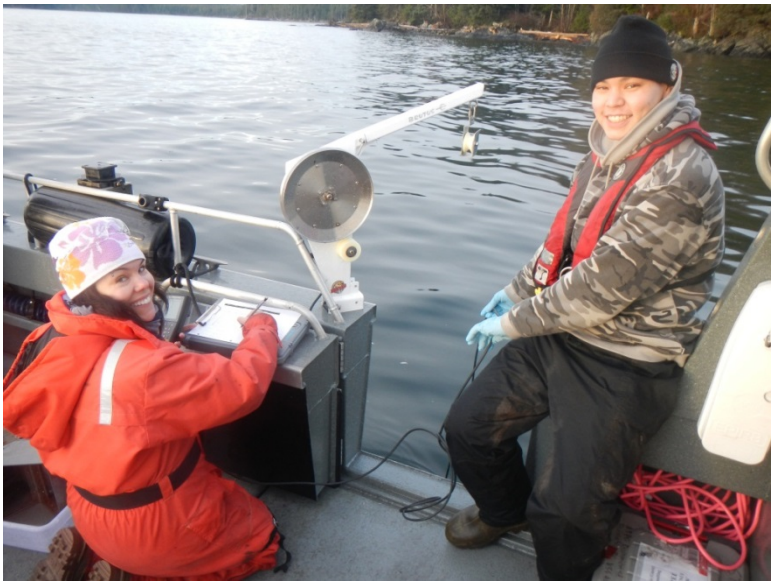

Photo 7: **In Situ Water Quality Data Collection Using a YSI ProPlus Multiparameter Meter (Site WQ_BB, at Berth 2, on Ebbing Tide)**

4.3 Data Analyses

Summary statistics were calculated for each dredge area and for each depth interval: total number of samples, minimum and maximum values, mean, median, standard deviation, number of samples exceeding screening criteria or sediment quality guidelines and number of samples with values equal to or lower than the corresponding detection level. Values less than detection were treated as one-half the detection limit for statistical purposes.

Sediment results were compared to Ocean Disposal screening criteria defined by the Disposal at Sea Regulations (SOR/2001-275) for PAHs, PCBs, mercury, and cadmium. Additional metals required for disposal at sea permitting in BC (arsenic, chromium, copper, lead, and zinc) were compared to Canadian Council of Ministers of the Environment (CCME) Interim Sediment Quality Guidelines (ISQGs) and Probable Effects Levels (PELs) for the Protection of Aquatic Life (CCME 2016). Disposal at sea screening criteria are further defined in the ECCC (2013) Disposal at sea Minimum Sample Analytical Requirements document (see Appendix 2). Results for PCDD/Fs were compared to the CCME ISQG and ECCC Interim Guidance for the Assessment of Risks from Dioxins and Furans in sediments proposed for Disposal at sea in Pacific and Yukon Region (ECCC 2014c; Appendix 2). Sediment screening criteria are presented in Table 4.

Table 4 Marine Sediment Screening Criteria

Parameter	Units	Screening Limit		
		Disposal at Sea[a]	CCME ISQG[b]	CCME PEL[b]
Cadmium	mg/kg	0.6	0.7	4.2
Mercury	mg/kg	0.75	0.13	0.7
Arsenic	mg/kg	7.24	7.24	41.6
Chromium	mg/kg	52.3	52.3	160
Copper	mg/kg	18.7	18.7	108
Lead	mg/kg	30.2	30.2	112
Zinc	mg/kg	124	124	271
Total PAHs	mg/kg	2.5	-	-
Total PCBs	mg/kg	0.1	0.0215	0.189
PCDD/Fs[c]	pg/g (TEQ)	9[d]	0.85[e]	21.5

NOTES:

[a] Disposal at sea Minimum Sample Analytical Requirements (ECCC 2013)

[b] CCME (2016)

[c] TEQs calculated using WHO 1998 TEFs for fish (van den Berg 1998)

[d] ECCC Lower Action Level (ECCC 2014c)

[e] ECCC Overall Management Objective (ECCC 2014c)

As a secondary option, an assessment of available sediment chemical characteristics was conducted to determine if the dredged material would be suitable for disposal on land. Sediment data were compared to BC Contaminated Sites Regulation (CSR) Schedule 7 (Standards Triggering Contaminated Soil Relocation Agreements) and Schedule 9 (Criteria to Protect Marine and/or Estuarine Aquatic Life), and BC Ministry of Environment (MOE) Technical Guidance 20, "Applicability of Sodium and Chloride Ion Soil Relocation Standards to Dredged Marine and Estuarine Materials."

Water quality results were compared to BC MOE Approved and Working Water Quality Guidelines for the Protection of Marine Aquatic Life, as shown in Table 5. Approved water quality guidelines were used where available; otherwise, screening was conducted using working water quality guidelines.

Table 5 Seawater Screening Criteria

Parameter	Units	BC MOE Water Quality Guidelines (Marine Aquatic Life)[a]	
		Long-term Average WQG	Short-term Maximum WQG
Physical Tests			
pH	-	-	7.0-8.7
Anions and Nutrients			
Ammonia, Total (as N)	mg/L	0.10-47[b] (2.2)	0.67-312[b] (15)
Fluoride (F)	mg/L	-	1.5
Nitrate (as N)	mg/L	3.7	-
Total Metals			
Arsenic (As)-Total	mg/L		0.0125
Beryllium (Be)-Total	mg/L	0.1[c]	
Boron (B)-Total	mg/L	1.2	
Cadmium (Cd)-Total	mg/L		0.00012[c]
Copper (Cu)-Total	mg/L	0.002	0.003
Lead (Pb)-Total	mg/L	0.002[d]	0.14
Manganese (Mn)-Total	mg/L		0.1[c]
Nickel (Ni)-Total	mg/L	0.0083[c]	
Selenium (Se)-Total	mg/L	0.002	
Silver (Ag)-Total	mg/L	0.0015	0.003
Vanadium (V)-Total	mg/L	0.05[c]	
Zinc (Zn)-Total	mg/L	0.01	0.055

NOTES:

[a] Approved Water Quality Guideline, per BC MOE 2016, unless otherwise noted

[b] The ammonia-N guidelines are dependent upon salinity, temperature, and pH. For saltwater with salinity of 30 ppt, temperature of 10 C, and pH of 8.0 (conditions which most conservatively represent the observations made during the December 2014 sampling program, for all sites), the short-term maximum guideline for total ammonia-Nis 15 mg/L, while the long-term average guideline is 2.2 mg/L.

[c] Working Water Quality Guidelines, per BC MOE 2015a

[d] 80% of the measured values less than or equal to 0.002 mg/L total Pb

4.4 Quality Assurance/Quality Control

A quality assurance/quality control (QA/QC) program was implemented to:

- Avoid cross-contamination during field sampling
- Maintain sample quality during transit
- Maintain appropriate analytical processes
- Maintain data integrity and avoid transcription errors.

Field programs were conducted in accordance with the BC Field Sampling Manual (BC MOE 2013), and Stantec's standard field procedures. Relevant QA/QC measures included:

- Collecting field duplicates for approximately 10% of samples to provide information about field-level homogenization success, and variation in intra-sample physical and chemical characteristics
- Using a new pair of nitrile gloves to take each sample to reduce the risk of cross contamination, and frequent changes of gloves throughout the sampling and decontamination process
- Cleaning all equipment between samples with Alconox powder detergent and acetone, and rinsing with deionized water
- Using new, clean, laboratory-supplied glass jars and plastic bags to store each sample
- Placing samples into an ice-chilled cooler, sealed, and delivered to the laboratory within the acceptable holding timeframes and temperature tolerance
- Delivering all samples under chain of custody
- Inclusion of a travel blank with a seawater shipment to detect any possible sample contamination introduced during transit
- Maintaining a clean and organized work space appropriate for scientific sampling purposes
- Using an appropriately certified and qualified laboratory.

ALS is a Canadian Association for Laboratory Accreditation accredited laboratory that uses recognized methods to conduct laboratory analyses. As part of their laboratory QA/QC program, ALS routinely uses method blanks, method spikes, control standards, surrogate recoveries, and the analysis of replicated sub-samples.

Variability of replicate results was assessed using relative percent difference (RPD) for duplicate samples analyzed for the field and internal laboratory replicates. The RDP is calculated as:

$$\text{RPD} = \left(\frac{|\,\text{Result of Replicate 1} - \text{Result of Replicate 2}\,|}{\text{Average of Result of Replicate 1 and Result of Replicate 2}} \right) * 100$$

5 RESULTS

Complete laboratory reports, including laboratory QA/QC results for sediment and water quality data, are provided in Appendix 4.

5.1 Quality Assurance/Quality Control

Laboratory duplicates were analyzed for percent moisture, particle size, TOC, metals, PAHs, PCBs, PCDD/Fs in sediment and for pH, conductivity, and salinity in water. The data quality objectives (DQOs), as specified by the laboratory for sediment, were 20% for percent moisture, 25% for particle size (gravel), 30% for TOC, 40% for high variability metals, 30% for other metals, and 50% for PCBs, PAHs, and PCDD/Fs for results that were greater than ten times the detection limit. Lab DQOs for water were 10% for conductivity, and 25% for salinity for results that were greater than ten times the detection limit.

Where a replicate was less than ten times the detection limit, results were reported as the difference between replicate values in the appropriate units, with a difference limit of 5 (particle size fractions), sample-specific limits for PCDD/Fs in sediment, and 0.3 (pH), 0.01 (aluminum) in seawater samples.

For PCDD/Fs in sediment, some values did not match the RPD criteria of the method as the duplicate had low level hits, but levels were below the lowest calibration level and therefore within method control. Otherwise, in all cases, replicated results were within the stated DQOs.

Method blanks, surrogate recovery rates, and certified reference materials were analyzed concurrently with sediment samples. Results were expressed as a percentage of target values, and fell within DQOs in all cases, with the exception of the method blank for some PCDD/F targets.

For field duplicates, RPD was calculated when the concentration of at least one of the duplicate pair was equal to or greater than five times the reportable detection limit. RPDs were compared to DQOs recommended by the BC MOE (2015b) (RPDs for duplicate field samples should not exceed 1.5 times the acceptable lab RPD for that parameter. The recommended RPD limits are presented in Table 6.

Table 6 Recommended Data Quality Objectives for Field Duplicate Results

Parameter Category		Recommended RPD
Organics in soil and sediment	Polycyclic Aromatic Hydrocarbons (PAH)	75%
	Most other typical organic parameters (assumed to apply to PCBs, PCDD/Fs	60%
Metals in soil	High variability metals (Ag, Al, Ba, Hg, K, Mo, Na, Pb, Sn, Sr, Ti)	60%
	Other metals	45%
Metals in water		30%
General Inorganics in water		30%

The DQOs for sediment field duplicates were met (or not applicable due to non-detects) for all metals and PCBs but were exceeded for several PAHs (fluoranthene, pyrene, and total PAHs) in one surface sediment sample (SS13) and at least one PCDD/F congener in 5 of 17 field duplicate samples. The water quality field duplicate met all DQOs.

The water quality travel blank was below detection limits for all analytes except for boron, which may be indicative of sample contact with boro-silicate glassware in the lab.

Analytical results for the field duplicates for sediment (see Table 5-1), water (see Table 5-2) and the travel blank (see Table 5-3) are included in Appendix 5 but are not included in the calculation of summary statistics.

5.2 Sediment Particle Size, Total Organic Carbon, and Paste Salinity

Sediment analytical results by dredge area and sample type are included in Table 6-1, Appendix 6, with summary statistics for moisture, particle size, and TOC by depth for the three areas (Berth 1, Berth 2, and MOF) provided in Tables 6-2 to 6-33, Appendix 6.

Analysis of paste salinity is required if the dredgeate is to be disposed of on land (see Section 5.7; required under the *BC Environmental Management Act* and associated Contaminated Sites Regulation (Schedule 7 Standards; BC Reg. 375/96, O.C. 1480/96 and M271/2004)). Paste salinity data are also summarized by proposed dredge area below.

5.2.1 Berth 1

Complete summary statistics for moisture, particle size composition, and TOC at sites in Berth 1 are available in Tables 6-2 to 6-12, Appendix 6, with average results provided in Table 7.

In the Berth 1 area, particle size in the top layers of sediment (0-0.75 m in surface grabs, 0-0.2 m, and 0-0.5 m intervals in cores) was predominantly sand (mean range: 30.9 to 47.3%) and silt (mean range: 33.2 to 44.7%), followed by clay (mean range: 18.1 to 21.8%), with little gravel (mean range: 1.10 to 2.59%). Deeper sediment layers (0.5-1.5 m at PCL sites and 0.2-1.0 m at PCS sites) consisted of a higher percentage of sand than shallower layers (mean range: 52.1 to 63.2%), followed by silt (mean range: 20.0 to 29.7%), clay (mean range: 10.8 to 16.1%), and gravel (mean range: 2.16 to 6.39%). The samples collected from two boreholes drilled at Berth 1 (from 3.1 to 4.6 m below mudline) had similar levels of sand (41.2 to 87.7%), silt (5.7 to 33.9%), and clay (1.2 to 23.3%) to levels reported for shallower sediment (see Appendix 8 for details).

Sediment moisture was higher in top sediment layers (0-0.75 m in surface grabs, 0-0.2 m, and 0-0.5 m intervals in cores), with a mean range of 31.1 to 41.0% than in deeper sediment layers (0.5-1.5 m at PCL sites and 0.2-1.0 m at PCS sites), which had a mean range of 24.2 to 27.7%. Mean TOC ranged from 0.94 to 1.67%, with no clear division between sediment layers.

Table 7 Berth 1 Mean Moisture, Particle Size, and Total Organic Carbon by Depth

Depth	Number of Samples	Moisture (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	TOC (%)
Surface Grabs							
0-0.075 m	9	41.0	2.59	30.9	44.7	21.8	1.67
Primary Core - Large (0.5 m intervals)							
0-0.5 m	10	31.2	1.63	47.3	33.2	18.1	1.31
0.5-1.0 m	9	27.7	3.54	60.9	23.3	12.3	1.02
1.0-1.5[a] m	9	24.2	6.39	62.9	20.0	10.8	0.94
1.5-2.0[a] m	5	27.0	2.66	55.2	27.0	15.1	n/a
>2.0[a] m	2	29.6	1.39	54.2	29.0	15.5	n/a
Primary Core - Small (0.2 m intervals)							
0-0.2 m	5	33.0	1.10	44.3	35.5	19.1	1.38
0.2-0.4 m	5	27.3	2.16	52.1	29.7	16.1	1.32
0.4-0.6 m	5	26.0	2.58	58.1	25.7	13.6	0.99
0.6-0.8[a] m	5	25.2	2.83	63.2	22.5	11.5	1.01
0.8-1.0[a] m	4	25.5	4.20	62.0	22.4	11.4	1.02

NOTES:

n/a not available; TOC not analyzed in samples >1.5 m depth.

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

All samples were analyzed for moisture and particle size. Samples <1.5 m depth only analyzed for TOC.

Average results for paste salinity by depth at Berth 1 are provided in Table 8. Complete salinity results can be found in Table 6-1, Appendix 6. Average sodium and chloride levels, as well as percent saturation values, were lower in deeper intervals (0.5-1.0 m and >1.0 m) than in surface intervals.

Table 8 Berth 1 Mean Paste Salinity by Depth

Depth	% Saturation	Sodium (mg/kg)	Chloride (mg/kg)
Surface Grabs			
0-0.075 m	57.2	5,094	9,761
Primary Core - Large (0.5 m intervals)			
0-0.5 m	47.8	3,146	5,816
0.5-1.0 m	39.0	2,318	4,380
1.0-1.5[a] m	34.2	2,101	4,017

NOTE:

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

5.2.2 Berth 2

Average results for moisture, particle size, and TOC at Berth 2 are provided in Table 9; complete summary statistics provided in Tables 6-13 to 6-22, Appendix 6.

Table 9 Berth 2 Mean Moisture, Particle Size, and TOC by Depth

Depth	Number of Samples	Moisture (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	TOC (%)
Surface Grabs							
0-0.075 m	6	45.5	3.24	17.2	51.9	28.2	1.48
Primary Core - Large (0.5 m intervals)							
0-0.5 m	6	35.7	2.79	19.5	49.7	26.9	1.27
0.5-1.0 m	4	32.0	3.57	31.0	45.6	19.9	0.95
1.0-1.5[a] m	4	26.1	6.14	56.7	26.3	11.0	0.77
1.5-2.0 m	2	14.3	3.74	59.5	27.1	9.81	n/a
Primary Core - Small (0.2 m intervals)							
0-0.2 m	4	37.7	0.52	15.0	54.3	30.3	1.70
0.2-0.4 m	4	33.0	5.00	26.6	46.3	24.6	1.12
0.4-0.6[a] m	4	28.6	9.02	30.2	43.0	22.3	1.03
0.6-0.8 m	2	32.8	0.98	10.0	61.0	28.0	1.06
0.8-1.0 m	2	31.1	0.41	23.0	54.0	22.6	1.02

NOTES:
n/a not available; TOC not analyzed in samples >1.5 m depth.
[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.
All samples were analyzed for moisture and particle size. Samples <1.5 m depth only analyzed for TOC.

For Berth 2, particle size is dominated by silt (mean range: 49.7 to 54.3%) in the shallowest sediment intervals followed by clay (mean range: 26.9 to 30.3%), sand (mean range: 15.0 to 17.2%), and little gravel (mean range: 0.52 to 3.24%). Deeper sediment intervals have a wider range of distribution of silt (mean range: 26.3 to 61.0%), clay (mean range: 9.81 to 28.0%), sand (mean range: 10.0 to 56.7%), and gravel (mean range: 0.41 to 9.02%). No borehole samples were analyzed for Berth 2 due to a lack of sample recovery below 2.5 m depth.

Moisture in Berth 2 sediment samples is less distinctly divided by depth than Berth 1 but follows a similar trend, with shallower samples (mean range: 35.7 to 45.5%) having a higher moisture content than deeper samples (mean range: 26.1 to 33.0%). Average TOC levels in Berth 2 ranged between 0.77 and 1.48%.

Average results for paste salinity by depth at Berth 2 are provided in Table 10. Complete salinity results can be found in Table 6-1, Appendix 6. Similarly to Berth 1, sodium, chloride, and percent saturation values decreased with deeper sampling depth intervals at Berth 2.

Table 10 Berth 2 Mean Paste Salinity by Depth

Depth	% Saturation	Sodium (mg/kg)	Chloride (mg/kg)
Surface Grabs			
0-0.075 m	64.0	5,498	10,775
Primary Core - Large (0.5 m intervals)			
0-0.5 m	59.4	3,728	6,788
0.5-1.0 m	50.5	3,268	6,105
1.0-1.5[a] m	34.6	2,273	4,280

NOTE:

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

5.2.3 Materials Off-Loading Facility

Average results for moisture, particle size, and TOC at the MOF are provided in Table 11, with summary statistics provided in Tables 6-23 to 6-33, Appendix 6.

The shallowest depth intervals in the MOF were predominantly sand (mean range: 52.3 to 61.6%) followed by silt (mean range: 22.9 to 32.4%), clay (mean range: 12.0 to 14.4%), and gravel (mean range: 1.80 to 3.50%). Deeper intervals had a higher percentage of sand (mean range: 53.5 to 70.4%) than surface intervals did, and had more silt (mean range: 18.9 to 29.8%) than clay (mean range: 6.94 to 15.7%) or gravel (mean range: 1.20 to 3.26%). Moisture content at the MOF was higher in samples from surface intervals (mean range: 27.5 to 35.9%) than deeper intervals (21.0 to 26.3%. TOC at the MOF ranged between 0.69 and 1.62%. The samples collected from four boreholes drilled at the MOF (from 1.98 to 6.10 m below mudline) had lower sand content (21.7 to 53.4%) and higher silt (34.8 to 54.8%) and clay (7.0 to 26.4%) content compared to levels reported for shallower sediment (see Appendix 8 for details).

Average results for paste salinity by depth at the MOF are provided in Table 12. Complete salinity results can be found in Table 6-1, Appendix 6. Similarly to Berths 1 and 2, all three analytes, percent saturation, sodium, and chloride, decrease in deeper sample intervals.

Table 11 MOF Mean Moisture, Particle Size, and TOC by Depth

Depth	Number of Samples	Moisture (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	TOC (%)
Surface Grabs							
0-0.075 m	13	35.9	1.22	52.3	32.4	14.4	1.62
Primary Core - Large (0.5 m intervals)							
0-0.5 m	13	27.5	1.80	59.7	26.0	12.5	1.08
0.5-1.0 m	11	25.4	1.20	63.5	24.3	11.1	0.93
1.0-1.5[a] m	11	25.1	2.17	70.4	18.9	8.75	0.69
1.5-2.0[a] m	10	21.0	3.05	68.3	20.2	8.47	n/a
>2.0[a] m	6	23.1	3.26	69.4	20.4	6.94	n/a
Primary Core - Small (0.2 m intervals)							
0-0.2 m	6	28.6	3.50	61.6	22.9	12.0	0.91
0.2-0.4 m	4	26.3	1.86	53.2	29.8	15.7	1.12
0.4-0.6 m	4	24.9	1.77	57.5	27.7	13.1	0.88
0.6-0.8 m	4	25.5	2.38	61.1	24.2	12.3	0.97
0.8-1.0 m	4	23.5	2.25	68.1	19.9	9.70	0.85

NOTES:

n/a not available; TOC not analyzed in samples >1.5 m depth.

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

All samples were analyzed for moisture and particle size. Samples <1.5 m depth only analyzed for TOC.

Table 12 MOF Mean Paste Salinity by Depth

Depth	% Saturation	Sodium (mg/kg)	Chloride (mg/kg)
Surface Grabs			
0-0.075 m	49.1	3,848	7,028
Primary Core - Large (0.5 m intervals)			
0-0.5[a] m	39.3	2,398	4,526
0.5-1.0 m	37.0	2,216	4,220
1.0-1.5 m	34.6	2,133	4,097

NOTE:

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

5.3 Sediment Metals

Complete analytical results for metals in sediments are presented in Table 6-1, Appendix 6. Sediments were analyzed for a suite of metals, including those relevant to disposal at sea (arsenic, cadmium, chromium, copper, lead, mercury, and zinc). No samples at any sites exceeded CCME PELs. Cadmium, chromium, lead, and zinc concentrations were below their ISQG and disposal at sea screening criteria in all samples analyzed.

At one site in the MOF (PMO3), mercury exceeded the CCME ISQG (0.13 mg/kg), but not the disposal at sea screening criterion (0.75 mg/kg) or CCME PEL (0.7 mg/kg). This surface sample had a mercury concentration of 0.267 mg/kg (see Table 6-1, Appendix 6).

Arsenic and copper exceeded CCME ISQGs and disposal at sea criteria at several sites. Elevated arsenic and copper levels are consistent with other sediment metal data from the Prince Rupert area, and are indicative of naturally-elevated levels of these metals in soils of the Skeena watershed (BC MOE 2010), and are substantially lower than CCME PELs, as discussed below for each dredge area.

5.3.1 Berth 1

5.3.1.1 Arsenic

In Berth 1, the CCME ISQG and disposal at sea criterion for arsenic (both set to the same value: 7.24 mg/kg) were exceeded for 26 of 41 (63%) samples analyzed (see Table 13). With a maximum concentration of 12.8 mg/kg, no samples exceeded the CCME PEL (41.6 mg/kg). Surface samples ranged from 4.49 to 10.20 mg/kg, with primary core samples in a similar range throughout the complete depth of the core (3.46 to 12.8 mg/kg).

Table 13 Berth 1 Arsenic Summary Statistics by Depth

Arsenic (mg/kg)	Number of Samples	Min	Max	Mean	Median	SD	No. < DL	No. > DAS Criteria	No. > CCME ISQG	No. >CCME PEL
Surface Grabs										
0-0.075 m	9	4.49	10.2	8.09	8.68	1.83	0	6	6	0
Primary Core - Large (0.5 m intervals)										
0-0.5 m	10	4.16	12.8	9.19	9.1	2.51	0	9	9	0
0.5-1.0 m	9	3.46	10.8	8.07	8.3	2.56	0	6	6	0
1.0-1.5[a] m	9	3.53	10.8	5.94	4.78	2.62	0	2	2	0
1.5-2.0 m	2	8.85	11.9	10.4	10.4	2.16	0	2	2	0
>2.0[a] m	2	6.83	11.0	8.92	8.9	2.95	0	1	1	0

NOTE:

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

Mean core concentrations are presented in Table 6-34, Appendix 6. Of the ten cores taken at Berth 1, seven had mean concentrations that exceeded CCME ISQG and the disposal at sea criterion, but not the CCME PEL for arsenic. Spatial distribution of arsenic exceedances in Berth 1 is presented in Figure 7.

5.3.1.2 Copper

The CCME ISQG and disposal at sea criterion for copper (18.7 mg/kg) were exceeded for 24 of 41 (59%) samples (see Table 14). Copper concentrations ranged throughout sample depth intervals but were highest in surface samples (11.9 to 46.5 mg/kg) and the shallowest intervals of large interval cores (9.81 to 40.8 mg/kg). Deeper core intervals ranged between 7.07 and 27.1 mg/kg.

Table 14 Berth 1 Copper Summary Statistics by Depth

Copper (mg/kg)	Number of Samples	Min	Max	Mean	Median	SD	No. < DL	No. > DAS Criteria	No. > CCME ISQG	No. >CCME PEL
Surface Grabs										
0-0.075 m	9	11.9	46.5	31.2	32.6	9.78	0	8	8	0
Primary Core - Large (0.5 m intervals)										
0-0.5 m	10	9.81	40.8	23.1	22.1	9.47	0	6	6	0
0.5-1.0 m	9	7.69	25.2	17.7	18.8	6.31	0	5	5	0
1.0-1.5[a] m	9	7.07	22.5	15.0	14.8	5.40	0	3	3	0
1.5-2.0 m	2	17.6	27.1	22.4	22.4	6.72	0	1	1	0
>2.0[a] m	2	11.8	26.2	19.0	19.0	10.2	0	1	1	0

NOTE:
[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

Mean core concentrations are presented in Table 6-35, Appendix 6. Of the ten cores taken at Berth 1, mean core concentrations exceeded the CCME ISQG and disposal at sea criterion, but not the CCME PEL in five cores. Spatial distribution of copper exceedances in Berth 1 is presented in Figure 8.

5.3.2 Berth 2

5.3.2.1 Arsenic

At Berth 2, arsenic concentrations exceeded CCME ISQG and disposal at sea criterion in 17 of 22 (78%) samples (see Table 15). The range of concentrations for surface samples (6.67 to 10.8 mg/kg) was similar to the range for depth intervals down to 1.5 m (6.39 to 12.80 mg/kg). The lowest depth interval (1.5-2.0 m) was analyzed for only two samples (3.28 and 3.71 mg/kg) both which were below the CCME ISQG or disposal at sea criteria (7.24 mg/kg).

Table 15 Berth 2 Arsenic Summary Statistics by Depth

Arsenic (mg/kg)	Number of Samples	Min	Max	Mean	Median	SD	No. < DL	No. > DAS Criteria	No. > CCME ISQG	No. >CCME PEL
Surface Grabs										
0-0.075 m	6	6.67	10.8	9.06	9.03	1.56	0	5	5	0
Primary Core - Large (0.5 m intervals)										
0-0.5 m	6	8.00	12.5	10.7	11.5	2.05	0	6	6	0
0.5-1.0 m	4	7.00	12.8	10.5	11.1	2.52	0	3	3	0
1.0-1.5[a] m	4	6.39	10.3	8.08	7.82	1.65	0	3	3	0
1.5-2.0 m	2	3.28	3.71	3.50	3.50	0.30	0	0	0	0

NOTE:

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

Mean core concentrations are presented in Table 6-36, Appendix 6. Of the six cores collected at Berth 2, mean core concentrations exceeded CCME ISQG and disposal at sea criteria, but not CCME PEL values for arsenic in five cores. A spatial distribution of arsenic exceedances in Berth 2 is presented in Figure 9.

5.3.2.2 Copper

The CCME ISQG and disposal at sea criterion for copper (18.7 mg/kg) was exceeded in 16 of 58 (28%) samples analyzed at Berth 2. There was a trend towards lower copper concentrations with deeper samples: surface samples ranged from 18.6 to 39.5 mg/kg and 0-0.5 m intervals ranged from 21.2 to 39.1 mg/kg, while deeper samples ranged from 11.6 to 37.4 mg/kg.

Table 16 Berth 2 Copper Summary Statistics by Depth

Copper (mg/kg)	Number of Samples	Min	Max	Mean	Median	SD	No. < DL	No. > DAS Criteria	No. > CCME ISQG	No. >CCME PEL
Surface Grabs										
0-0.075 m	6	18.6	39.5	33.0	34.3	7.65	0	5	5	0
Primary Core - Large (0.5 m intervals)										
0-0.5 m	6	21.2	39.1	29.6	28.8	8.48	0	6	6	0
0.5-1.0 m	4	15.3	37.4	25.7	25.1	9.10	0	3	3	0
1.0-1.5[a] m	4	11.6	19.2	15.2	14.9	3.27	0	1	1	0
1.5-2.0 m	2	13.0	19.5	16.3	16.3	4.60	0	1	1	0

NOTE:

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

Mean core concentrations are presented in Table 6-37, Appendix 6. Of the six cores collected at Berth 2, mean core concentrations exceeded the CCME ISQG and disposal at sea criterion, but not the CCME PEL in five cores. Spatial distribution of copper exceedances at Berth 2 is presented in Figure 10.

5.3.3 Materials Off-loading Facility

5.3.3.1 Arsenic

In the MOF, arsenic concentrations were higher than the CCME ISQG and disposal at sea criterion (7.24 mg/kg) in 22 of 52 (42%) of the samples analyzed. Arsenic concentrations did not show a trend across the depth intervals, ranging from 2.07 to 9.14 mg/kg in surface samples, 2.00 to 9.73 mg/kg in shallower interval samples (0-0.5 m), and 3.49 to 9.73 mg/kg in deeper interval samples.

Table 17 MOF Arsenic Summary Statistics by Depth

Arsenic (mg/kg)	Number of Samples	Min	Max	Mean	Median	SD	No. < DL	No. > DAS Criteria	No. > CCME ISQG	No. >CCME PEL
Surface Grabs										
0-0.075 m	13	2.07	9.14	6.40	7.77	2.72	0	8	8	0
Primary Core - Large (0.5 m intervals)										
0-0.5[a] m	13	2.00	9.73	6.54	5.61	2.37	0	6	6	0
0.5-1.0 m	11	3.49	9.54	6.76	6.61	1.90	0	5	5	0
1.0-1.5[a] m	11	3.52	8.88	5.99	5.91	1.54	0	2	2	0
1.5-2.0 m	2	6.40	8.19	7.30	7.30	1.27	0	1	1	0
>2.0[a] m	2	4.84	7.01	5.93	5.93	1.53	0	0	0	0

NOTES:

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

Mean core concentrations are presented in Table 6-38, Appendix 6. Of the thirteen cores collected at the MOF, concentrations exceeded the CCME ISQG and disposal at sea criterion, but not the CCME PEL for arsenic in four cores. Spatial distribution of arsenic exceedances in the MOF is presented in Figure 11.

5.3.3.2 Copper

Copper concentrations exceeded the CCME ISQG and disposal at sea criterion in 17 of 53 (26%) samples analyzed at the MOF. The surface samples had the highest levels (2.79 to 41.8 mg/kg), with a slight trend toward lower concentrations in intervals from the deeper core samples (3.54 to 29.5 mg/kg).

Table 18 MOF Copper Summary Statistics by Depth

Copper (mg/kg)	Number of Samples	Min	Max	Mean	Median	SD	No. < DL	No. > DAS Criteria	No. > CCME ISQG	No. >CCME PEL
Surface Grabs										
0-0.075 m	13	2.79	41.8	23.3	25.9	13.3	0	9	9	0
Primary Core - Large (0.5 m intervals)										
0-0.5[a] m	13	3.54	29.5	16.9	14.9	6.80	0	6	6	0
0.5-1.0 m	11	7.02	21.6	12.7	11.8	4.71	0	1	1	0
1.0-1.5[a] m	11	5.68	19.4	10.1	9.24	3.66	0	1	1	0
1.5-2.0 m	2	8.31	14.7	11.5	11.5	4.52	0	0	0	0
>2.0[a] m	2	7.49	10.6	9.05	9.0	2.20	0	0	0	0

NOTES:

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

Mean core concentrations are presented in Table 6-39, Appendix 6. Of the 13 cores collected at the MOF, concentrations exceeded the CCME ISQG and disposal at sea criterion, but not the CCME PEL for copper in only 1 core. Spatial distribution of copper exceedances in the MOF is presented in Figure 12.

5.4 Sediment Polycyclic Aromatic Hydrocarbons

Complete analytical results for sediment PAH concentrations are presented in Table 6-1, Appendix 6. A suite of 16 PAHs relevant to ocean disposal was measured (see Table 19) and total PAH was calculated. The PAHs were frequently below detection limits at most sites. In several shallow samples in the MOF, when PAHs were detectable, samples exceeded CCME ISQGs for individual PAHs. None of the PAHs analyzed exceeded CCME PELs. The disposal at sea criterion for total PAHs (2.50 mg/kg) was not exceeded in any sample.

Table 19 Polycyclic Aromatic Hydrocarbons (PAHs) Analyzed in Sediment Samples

Polycyclic Aromatic Hydrocarbons			
Acenaphthene	Benzo(a)pyrene	Chrysene	Indeno(1,2,3-cd)pyrene
Acenaphthylene	Benzo(b)fluoranthene	Dibenzo(a,h)anthracene	Naphthalene
Anthracene	Benzo(g,h,i)perylene	Fluoranthene	Phenanthrene
Benzo(a)anthracene	Benzo(k)fluoranthene	Fluorene	Pyrene

5.4.1 Berth 1

Summary statistics for total PAHs at Berth 1 are provided in Table 6-40, Appendix 6. Of the 16 PAHs analyzed, 11 were below detection limits and benzo(b)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene were detected. Total PAH was above detection limits in surface samples BA04 and BA05 (0.31 and 0.33 mg/kg, respectively).

For core samples, 12 PAHs were detected and 4 (acenaphthene, acenaphthylene, dibenz(a,h)anthracene, and fluorene) were below detection limits (see Table 6-1, Appendix 6). Total PAH ranged from below the detection limit to 0.29 mg/kg.

No exceedances of the disposal at sea criterion (2.50 mg/kg total PAH) occurred in samples from Berth 1.

5.4.2 Berth 2

Summary statistics of total PAHs at Berth 2 are provided in Table 6-41, Appendix 6. Surface samples had PAH concentrations below detection limits except in two samples (SS05 and SS06, with seven PAHs detected) (see Table 6-1, Appendix 6). Total PAHs ranged from 0.089 to 0.116 mg/kg.

Detectable levels of PAHs occurred down to the 0.5 to 1.0 m depth interval in some core samples from Berth 2 (see Table 6-1, Appendix 6), with 8 PAHs detected. All PAHs detected were below CCME ISQGs and PELs and all except two cores had no detectable PAH. PCL14 0 to 0.5 m had 0.081 mg/kg total PAH and PCL12 0 to 0.5 m had 0.118 mg/kg total PAH.

No exceedances of the disposal at sea criterion (2.50 mg/kg total PAHs) occurred in Berth 2.

5.4.3 Materials Off-loading Facility

Summary statistics for total PAHs at the MOF are provided in Table 6-42, Appendix 6. All 16 PAHs were detected in surface samples collected at the MOF (see Table 6-1, Appendix 6), with four samples (PM02, SS10, SS12, and SS13) having PAH concentrations higher than the CCME ISQGs. Exceedances were acenaphthene, acenaphthylene, anthracene, benz(a)anthracene, dibenz(a,h)anthracene, fluoranthene, phenanthrene, and pyrene. Total PAH concentrations in the surface samples were below the disposal at sea criterion at all sites, ranging from below detection limits (5 of 13 samples) to 0.810 mg/kg (PM02).

Core samples taken at the MOF had detectable levels of 13 PAHs. One core sample (PCL25 0-0.5 m) had naphthalene levels higher than its CCME ISQG (see Table 6-1, Appendix 6). No values exceeded CCME PELs for any PAHs. Total PAH ranged from below the detection limit to 0.282 mg/kg; all samples were below the disposal at sea screening criterion.

5.5 Sediment Polychlorinated Biphenyls

Complete sediment PCB concentrations are presented in Table 6-1, Appendix 6. Nine individual PCBs were analyzed (see Table 20) and total PCB values were calculated for all samples at all three sites.

Table 20 Polychlorinated Biphenyl (PCB) Congeners Analyzed in Sediment Samples

Polychlorinated Biphenyls (PCBs)		
Aroclor 1016	Aroclor 1242	Aroclor 1260
Aroclor 1221	Aroclor 1248	Aroclor 1262
Aroclor 1232	Aroclor 1254	Aroclor 1268

All analyzed PCBs were below detection limits (0.010 or, in some cases, 0.020 mg/kg). All samples in the Berth 1, Berth 2, and MOF areas were below the CCME ISQG (0.0215 mg/kg), CCME PEL (0.189 mg/kg), and disposal at sea screening criterion (0.1 mg/kg) for total PCBs.

5.6 Sediment Dioxins and Furans

Complete sediment PCDD/F data are presented in Table 6-1, Appendix 6. PCDD/Fs were analyzed in 19 surface sediment grab samples, and 15 core sample sites among the three dredge areas. Samples were analyzed for seven dioxin congeners and ten furan congeners (see Table 21).

Table 21 Dioxin and Furan (PCDD/F) Congeners Analyzed in Sediment Samples

Dioxin (PCDD) Congeners	Furan (PCDF) Congeners
2,3,7,8-TCDD	2,3,7,8-TCDF
1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF
1,2,3,4,7,8-HxCDD	2,3,4,7,8-PeCDF
1,2,3,6,7,8-HxCDD	1,2,3,4,7,8-HxCDF
1,2,3,7,8,9-HxCDD	1,2,3,6,7,8-HxCDF
1,2,3,4,6,7,8-HpCDD	1,2,3,7,8,9-HxCDF
OCDD	2,3,4,6,7,8-HxCDF
	1,2,3,4,6,7,8-HpCDF
	1,2,3,4,7,8,9-HpCDF
	OCDF

To evaluate the potential for adverse effects from exposure to PCDD/Fs of varying potency, toxic equivalency (TEQ) values were calculated using the World Health Organization (WHO) 1998 toxic equivalency factors (TEFs) for fish, as described in CCME (2001). The data summarized here (and presented in Table 6-1, Appendix 6) are presented as “mid-point” TEQs, where individual congener concentrations below the analytical detection limit were assumed to be one half of the detection limit.

Mid-point TEQs are compared to the CCME ISQG (0.85 pg/g TEQ) and the CCME PEL (21.5 pg/g TEQ). Additionally, interim guidance for disposal at sea in the Prince Rupert area (ECCC 2014c; Appendix 2) provides a “lower action level” (LAL) value of 9 pg/g TEQ, to which PCDD/F TEQs are compared.

ECCC interim guidance for assessing risk associated with disposal of sediments containing dioxins and furans provides draft regulatory guidance should disposal of sediments occur at a "non-dispersive" site (a site assumed to be depositional, where sediment tends to naturally accumulate). ECCC has previously made reference to the Puget Sound Disposal Site Work Group (1989) definition of a non-dispersive site, at which peak 1% near-bottom current speeds are less than 0.25 m/s (25 cm/s), with existing sediments at the site having small grain sizes and statistically elevated volatile solids, biochemical oxygen demand, and water content. Several potential disposal sites are being considered for the Project and the following information is presented to inform the assessment of waste management alternatives, including the potential for disposal at sites that may or may not be non-dispersive.

5.6.1 Sediment Dioxins and Furans in the Study Area

5.6.1.1 Berth 1

Summary statistics of mid-point TEQs for PCDD/Fs at Berth 1 are presented in Table 22. Of the 30 samples analyzed for PCDD/Fs at Berth 1, no samples exceeded the LAL (9 pg/g TEQ) or CCME PEL (21.5 pg/g TEQ). Concentrations were higher than the CCME ISQG (0.85 pg/g TEQ) in 5 of the 6 surface grab samples and 2 of the 24 core samples from 5 cores (both from the 0-0.2 m interval):

- In surface grab samples, concentrations ranged from 0.78 to 2.86 pg/g TEQ.
- In the cores, concentrations decreased with depth, with a range of 0.293 to 1.23 pg/g TEQ in surface samples (0 to 0.2 m) and 0.041 to 0.283 pg/g TEQ in deeper cores (0.2 to 1.0 m).

Table 22 Berth 1 PCDD/F Summary Statistics by Depth

Depth	Number of Samples	Concentration (pg/g TEQ)[a]					No. > EC LAL[c]	No. > CCME ISQG[c]	No. >CCME PEL[c]
		Min	Max	Mean	Median	SD			
Surface Grabs									
0-0.075 m	6	0.780	2.86	1.677	1.760	0.77	0	5	0
Primary Core -Small (0.2 m intervals)									
0-0.2 m	5	0.293	1.230	0.664	0.450	0.43	0	2	0
0.2-0.4 m	5	0.129	0.253	0.214	0.235	0.05	0	0	0
0.4-0.6 m	5	0.071	0.204	0.134	0.136	0.06	0	0	0
0.6-0.8[b] m	5	0.045	0.211	0.109	0.080	0.06	0	0	0
0.8-1.0[b] m	4	0.041	0.283	0.150	0.138	0.11	0	0	0

NOTES:

[a] Mid-point TEQ derived from WHO (1998) TEFs for fish

[b] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

[c] Number of samples greater than guideline

Figure 13 provides a geographical distribution of PCDD/Fs in core samples collected at Berth 1 and highlights surface samples that exceeded the CCME ISQG (data presented in Table 6-1, Appendix 6).

5.6.1.2 Berth 2

Summary statistics of mid-point TEQs for PCDD/Fs at Berth 2 are presented in Table 23. Similarly to Berth 1, no sediment samples collected exceeded the LAL or the CCME PEL. Concentrations were higher than the CCME ISQG in 3 of 21 samples; two surface grab samples and the 0 to 0.2 m interval in one core:

- In surface grabs, concentrations ranged from 0.311 to 2.110 pg/g TEQ.
- In cores, concentrations were highest in the shallowest interval (0 to 0.2 m), ranging from 0.265 to 1.055 pg/g TEQ, and lower in the deeper intervals, ranging from 0.083 to 0.824 pg/g TEQ.

Table 23 Berth 2 PCDD/F Summary Statistics by Depth

Depth	Number of Samples	Concentration (pg/g TEQ)[a]					No. > EC LAL[c]	No. > CCME ISQG[c]	No. >CCME PEL[c]
		Min	Max	Mean	Median	SD			
Surface Grabs									
0-0.075 m	5	0.311	2.110	0.925	0.728	0.72	0	2	0
Primary Core -Small (0.2 m intervals)									
0-0.2 m	4	0.265	1.055	0.612	0.564	0.36	0	1	0
0.2-0.4 m	4	0.111	0.824	0.321	0.175	0.34	0	0	0
0.4-0.6[b] m	4	0.083	0.299	0.216	0.242	0.10	0	0	0
0.6-0.8 m	2	0.099	0.358	0.228	0.228	0.18	0	0	0
0.8-1.0 m	2	0.341	0.456	0.399	0.399	0.08	0	0	0

NOTES:

[a] Mid-point TEQ derived from WHO (1998) TEFs for fish

[b] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

[c] Number of samples greater than guideline

Figure 14 provides a geographical distribution of PCDD/Fs in core samples collected at Berth 2 and highlights surface samples that exceeded the CCME ISQG (data presented in Table 6-1, Appendix 6).

5.6.1.3 MOF

For the 30 samples collected at the MOF and analyzed for PCDD/Fs, none exceeded the LAL or the CCME PEL, but 7 had concentrations higher than the CCME ISQG; 5 surface grab samples and 2 surface interval (0 to 0.2 m) core samples:

- In surface grabs, concentrations ranged from 0.213 to 2.780 pg/g TEQ.
- In cores, concentrations ranged from 0.12 to 1.068 pg/g TEQ in samples from the surface interval (0 to 0.2 m) and from 0.050 to 0.386 pg/g TEQ in the deeper intervals (0.2 to 1.0 m).

Table 24 MOF PCDD/F Summary Statistics by Depth

Depth	Number of Samples	Concentration (pg/g TEQ)[a]					No. > EC LAL[b]	No. > CCME ISQG[b]	No. >CCME PEL[b]
		Min	Max	Mean	Median	SD			
Surface Grabs									
0-0.075 m	8	0.213	2.780	1.270	1.334	0.98	0	5	0
Primary Core -Small (0.2 m intervals)									
0-0.2 m	6	0.120	1.068	0.586	0.470	0.39	0	2	0
0.2-0.4 m	4	0.101	0.226	0.149	0.134	0.05	0	0	0
0.4-0.6 m	4	0.058	0.386	0.158	0.094	0.15	0	0	0
0.6-0.8 m	4	0.050	0.250	0.118	0.086	0.09	0	0	0
0.8-1.0 m	4	0.053	0.208	0.111	0.091	0.07	0	0	0

NOTES:

[a] Mid-point TEQ derived from WHO (1998) TEFs for fish

[b] Number of samples greater than guideline

Figure 15 provides a geographical distribution of PCDD/Fs in core samples collected at the MOF and highlights surface samples that exceeded the CCME ISQG (data presented in Table 6-1, Appendix 6).

5.6.2 Sediment Dioxins and Furans in the Prince Rupert Region

Additional context for concentrations of PCDD/Fs in the Prince Rupert region at the Brown Passage disposal site and in the Prince Rupert Harbour is provided below.

5.6.2.1 Brown Passage

Contaminants of concern in sediments at two previously used ocean disposal sites in northern BC (Brown Passage and Douglas Channel) were assessed by DFO in 2011 (Ross et al. 2011). At Brown Passage (the closest previously used disposal at sea site to Prince Rupert), surface sediment samples were collected from within the disposal site boundaries, adjacent to the disposal site, and a nearby reference location. Samples were analyzed for 37 dioxin congeners and 56 furan congeners, and reported as total PCDD/F TEQs (see Table 25).

Table 25 Sediment Concentrations of PCDD/Fs at Brown Passage Disposal at Sea Site

Location	Number of Samples	Total PCDD/F Concentration (pg/g dw)				TEQ (pg/g dw TEQ)	
		PCDD		PCDF			
		Mean	SD	Mean	SD	mean	sd
Brown Passage Disposal Site	19	27.3	11.2	4.9	1.3	0.23	0.12
Near the Brown Passage disposal site	37	36.6	16.7	7.28	3.66	0.29	0.14
Reference Site[1]	3	54.3	1.69	11.2	0.57	0.50	0.03

NOTES:
[1]Reference site approximately 6 km northeast of Brown Passage Disposal Site
TEQ calculated using WHO (1998) TEFs for fish

REFERENCE:
Ross et al. (2011)

Mean PCDD/F TEQs at the Brown Passage disposal at sea site (0.23 pg/g TEQ) are lower than those of surface samples collected at Berth 1 (1.667 pg/g TEQ; see Table 22), Berth 2 (0.925 pg/g TEQ; see Table 23), or the MOF (1.270 pg/g TEQ; see Table 24), which is expected given the relative proximity of these sites to the identified source of PCDD/Fs, the former Skeena Cellulose pulp and paper mill.

5.6.2.2 Prince Rupert Harbour

Several recent proposed projects in the PRPA jurisdiction have characterized PCDD/F concentrations in sediment near the study area. These include the following:

- An investigation into the Pacific NorthWest Liquid Natural Gas (PNW LNG) proposed MOF dredge area (in Porpoise Channel, between Ridley and Lelu islands) had samples with mid-point PCDD/F concentrations ranging from 0.06 to 2.64 pg/g TEQ with the highest concentrations in shallow sediments (within 0.5 m of the surface). In the previously proposed marine berth dredge area for the same project (on Agnew Bank, southeast of Lelu Island), TEQs ranged between 0.04 and 8.26 pg/g, with the highest concentrations in the shallowest (0-0.2 m and 0.2-0.4 m) depth intervals (Stantec 2014a).
- Sampling conducted in support of the Canpotex project (<2 km west of Ridley island) found PCDD/Fs in surface grab and core samples (to 2.13 m depth) collected in 2006, 2012, and 2013 from the proposed dredge area ranged from 0.03 to 6.25 pg/g mid-point TEQ, again with the highest concentrations found in the shallowest surface samples. In the nearby proposed disposal area and modelled plume zone for the Canpotex project, TEQs were 0.36 to 1.08 pg/g in surface samples (Stantec 2014b).
- The Prince Rupert Gas Transmission (PRGT) marine pipeline approach area (0 to 5 km southwest of Lelu Island) had samples with PCDD/F concentrations ranging from 0.074 to 0.234 pg/g mid-point TEQ in surface samples and core samples down to 1 m depth (Stantec 2014c).
- One composite surface sample (from 3 individual grabs) collected for the Fairview Phase II Project near Kaien Island had a PCDD/F concentration of 0.78 pg/g mid-point TEQ (Stantec 2009).

- For the Westcoast Connector Gas Transmission project, sediment surface grabs and core samples (to 1.5 m) were collected west of Ridley Island to chemically characterize sediments (Archipelago Marine Research Ltd. 2014). Concentrations of PCDD/Fs in surface samples (0-0.2 m depth) had an average TEQ of 2.2 pg/g, with a maximum mid-point TEQ of 5.8 pg/g. The highest PCDD/F concentration, however, was in the 0.2-0.4 m layer (7.0 pg/g TEQ).

5.6.3 Sediment Dioxin and Furan Data in the Context of a Non-Dispersive Site

In accordance with draft *Interim Guidance for the Assessment of Risks from Dioxins and Furans in Sediments Proposed for Disposal at Sea in Pacific and Yukon Region* (ECCC 2014c; Appendix 2), a volume weighted approach to assessing PCDD/F risk from sediment disposal at sea in non-dispersive sites is required. This approach is comprised of several successive analyses:

1. Identification of "sampling units" within the dredge area
2. Calculating the 95% upper confidence limit (UCL) within each sampling unit
3. Calculating the volume-weighted average of sampling units that fall within the EC LAL (9 pg/g TEQ) to determine if the dredged material from the entire dredging project is below the OMO (0.85 pg/g TEQ) for a non-dispersive site.

5.6.3.1 Identification of Sampling Units

Interim guidance for PCDD/Fs in sediments for disposal at sea (ECCC 2014c; Appendix 2) states that sampling units are "within the strata of concern, each 20 cm vertical layer […] assuming each of these 20 cm fractions has similar physical properties." Within the strata of concern (top 1.0 m) in the dredge areas, each 0.2 m interval was analyzed for both PCDD/Fs and detailed particle size (see Table 6-1, Appendix 6). To assess homogeneity of physical properties for each 0.2 m interval, an analysis of variance (ANOVA) was completed across all depth intervals analyzed within each measured parameter (moisture, particle size, and TOC). Not all results among depth intervals of a single parameter were normally distributed; therefore, a non-parametric ANOVA (Kruskal-Wallis ANOVA on ranks) was used on non-normal data.

Resulting p-values from ANOVA analyses are presented in Table 26. No single physical parameter was significantly different ($p<0.05$) among 0.2 m depth intervals at all PCS sampling sites.

Table 26 Analysis of Variance (ANOVA) P-Values among 0.2 m Intervals for Physical Parameters in Sediment

Parameter	P-value		
	Berth 1	Berth 2	MOF
Moisture (%)	0.174[a]	0.127[a]	0.762
Gravel (%)	0.171[a]	0.067[a]	0.804
Sand (%)	0.407[a]	0.834	0.758[a]
Silt (%)	0.485[a]	0.769	0.489[a]
Clay (%)	0.241[a]	0.782[a]	0.885[a]
TOC	0.299	0.055	0.938

NOTES:
Analyses were completed in Sigmaplot 12.0
[a] Kruskal-Wallis Analysis of Variance on Ranks

The lack of difference for physical parameters among 0.2 m intervals suggests that each 20 cm fraction "has similar physical properties" and can be treated as a single sampling unit for the purposes of the volume weighted calculation for assessment of risks from dioxins and furans in sediment for disposal at sea (ECCC 2014c; Appendix 2).

5.6.3.2 Calculation of 95% UCL TEQs for each Sampling Unit

Following a confirmation of 0.2 m sampling intervals, a 95% upper confidence limit (UCL) was determined for each TEQ value within each sampling interval within the strata of concern (<1.0 m depth) and for the low risk horizon (1.0 – 15 m) as a whole in each area. Interim guidance requires a comparison of 95% UCL TEQs to a lower action level (LAL) value of 9 pg/g TEQ (ECCC 2014c; Appendix 2).

95% UCL TEQs (see Table 27) were calculated using standard bootstrapping using the ProUCL software (Version 5.0) publicly available from the United States Environmental Protection Agency (US EPA 2016). Due to low sample numbers (n ≤ 4), calculating 95% standard bootstrap (as recommended in ECCC 2014c; Appendix 2) was not possible for all sampling units (see Table 27). The ProUCL recommended 95% UCL calculation for all data sets was for a 95% student's-t UCL calculation. 95% student's-t UCL TEQs were consistently higher (more conservative) than 95% standard bootstrap UCL TEQs (see Table 27). In cases where 95% standard bootstrap UCL TEQs were not available due to low sample numbers, 95% student's-t UCL TEQs were used for comparison to the LAL. The 95% UCL TEQs within the low risk horizon were calculated conservatively using data from the next shallowest horizons.

All 95% UCL TEQs were considerably lower than the 9 pg/g LAL (see Table 27), ranging from 0.151 to 1.078 pg/g TEQ for Berth 1, from 0.33 to 1.036 pg/g TEQ for Berth 2, and from 0.195 to 0.827 pg/g TEQ for the MOF. Berth 2 95% UCL TEQs were not calculated for 0.6-1.0 m depth intervals because of low sample numbers (n=2 in each stratum). PCDD/F TEQ values for the 0.6-0.8 m depth intervals at Berth 2 (see Table 6-1, Appendix 6) were 0.358 and 0.099 pg/g TEQ (PCS 11 and 14, respectively), while 0.8-1.0 m depth intervals were 0.456 and 0.341 pg/g TEQ (PCS 11 and 14, respectively).

5.6.3.3 Calculation of Overall Volume-Weighted TEQs

Because all 95% UCL TEQs were below the LAL, all sampling unit values were carried forward to complete a calculation of overall volume-weighted TEQs for each dredge area following the interim guidance (ECCC 2014c; Appendix 2). To calculate a volume-weighted TEQ by sampling unit interval, a total estimated soft sediment dredge volume for each sampling unit was first determined. Figures representing estimated sediment dredge areas with overlayed sediment sampling points are presented in Figure 16 to Figure 19 for Berths 1 and 2, and in Figure 20 and Figure 21 for the MOF area.

A percentage of total estimated dredge volume was calculated for each 0.2 m sampling unit (see Table 27). Using each sampling unit's percent of total estimated dredge-volume, each 95% UCL TEQ volume was volume weighted. A sum of volume-weighted TEQs for each dredge area was then calculated to determine the overall volume-weighted TEQs (see Table 27).

As per interim guidance for assessment of risk from PCDD/Fs in sediment for disposal at sea (ECCC 2014c; Appendix 2), overall volume weighted TEQs are to be compared to the overall management objective (OMO) of 0.85 pg/g TEQ. All overall volume weighted TEQs were well below the OMO. Overall volume-weighted TEQs were 0.306 pg/g TEQ for Berth 1, 0.484 pg/g TEQ for Berth 2, and 0.246 pg/g TEQ.

According to interim guidance for PCDD/F sediment disposal at sea in the area (ECCC 2014c; Appendix 2), sampling units in the strata of concern (i.e., all intervals in the top 1.0 m) meet the standards (95% UCL TEQs < 9 pg/g LAL and overall volume-weighted concentration of PCDD/Fs TEQ < 0.85 pg/g OMO) for open-water disposal at non-dispersive sites.

Table 27 Overall Volume Weighted TEQs for PCDD/Fs

Area	Vertical Dredge Horizons	Sampling Unit (m)	Number of Samples	95% Standard Bootstrap UCL TEQ (pg/g)	95% Student's-t UCL TEQ (pg/g)	95% UCL TEQ >9 pg/g LAL?	Sampling Unit % of Total Dredge Volume	Volume-Weighted TEQ (pg/g)
Berth 1	Strata of Concern	0-0.2	5	0.948	1.078	No	6.53%	0.062
		0.2-0.4	5	0.247	0.261	No	6.27%	0.015
		0.4-0.6	5	0.172	0.189	No	6.01%	0.010
		0.6-0.8	5	0.151	0.170	No	5.75%	0.009
		0.8-1.0	4	N/A	0.278	No	5.50%	0.015
	Low Risk Horizon	1.0-15	4[a]	N/A	0.278	No	69.94%	0.194
	Berth 1: Overall Volume Weighted TEQ							**0.306**
Berth 2	Strata of Concern	0-0.2	4	N/A	1.036	No	6.53%	0.068
		0.2-0.4	4	N/A	0.718	No	6.07%	0.044
		0.4-0.6	4	N/A	0.330	No	5.60%	0.018
		0.6-0.8	2	N/A	N/A	No	5.15%	n/a
		0.8-1.0	2	N/A	N/A	No	4.73%	n/a
	Low Risk Horizon	1.0-15	4[a]	N/A	0.493	No	71.93%	0.355
	Berth 2: Overall Volume Weighted TEQ							**0.484**
MOF	Strata of Concern	0-0.2	6	0.827	0.904	No	6.29%	0.052
		0.2-0.4	4	N/A	0.213	No	5.99%	0.013
		0.4-0.6	4	N/A	0.339	No	5.71%	0.019
		0.6-0.8	4	N/A	0.229	No	5.45%	0.012
		0.8-1.0	4	N/A	0.195	No	5.19%	0.010
	Low Risk Horizon	1.0-15	4 [a]	N/A	0.195	No	71.37%	0.139
	MOF: Overall Volume Weighted TEQ							**0.246**

NOTES:

95% UCL calculations were completed in ProUCL software (Version 5.0). In all cases, 95% Student's-t UCL was recommended for the dataset. Volume-weighted TEQ was calculated using 95% Student's-t UCL when 95% Bootstrap UCL was not available (N/A) due to low N numbers.

Total dredge volume includes only soft sediment (no rock) in the proposed dredge footprint.

[a] no PCDD/F data were available for horizons deeper than 1.0 m. 95% UCLs were calculated conservatively using the four concentrations in the immediately shallower horizons (in the case of Berth 2 this includes two values from 0.6-0.8 m and two values from 0.8-1.0 m sampling units).

5.7 Chemical Suitability for Sediment Disposal on Land

An alternative sediment disposal option is disposal of dredged sediment (either just the surface [0-1.0 m] or all dredged sediments [down to -15 m CD]) on land within the boundary of the Project Development Area on Digby Island (see Figure 1).

As the potential sediment disposal site would likely fall under provincial jurisdiction, the BC CSR and the BC MOE Technical Guidance 20 would apply. It is expected that the Project Development Area on Digby Island would fall under the BC MOE defined 'Wildland' land use and therefore, a comparison of the data to BC CSR Schedule 7, Column II standards (Soil relocation to non-agricultural land) would be applicable. A complete comparison of data to BC CSR Schedule 7 and Schedule 9 is presented in Table 6-1, Appendix 6. All applicable CSR Schedule 7 metal analytes were not analyzed in the current field program and may require supplemental analysis if disposal on land is to proceed.

Outside of sodium and chloride (summarized in Section 5.2), analytes compared to CSR Schedule 7 did not exceed Column II (soil relocation to non-agricultural land) standards (see Table 6-1, Appendix 6). BC MOE Technical Guidance 20 states that if the land disposal site is a near-shore site (as would be expected in sites within the Project Development Area on Digby Island) and the remaining contaminants of concern do not exceed Schedule 7, Column II, no Contaminated Soil Relocation Agreement (CSRA) would be necessary for disposal of dredgeate on land.

5.8 Water Chemistry

5.8.1 Seawater

All water quality samples were analyzed for conductivity, hardness, pH, salinity, and TSS, along with anions and nutrients, total metals, and chlorophyll *a*. Analytical results for water quality are included in Appendix 7, Table 7-1. Summary statistics of analyzed water quality parameters are presented in Appendix 7, Table 7-2. Field data included depth profiles of salinity, dissolved oxygen, temperature, conductivity, total dissolved solids (TDS), pH, turbidity, and secchi disk depth. Field data are presented in Appendix 7, Table 7-3.

Water quality data were compared to BC MOE Approved and Working Water Quality Guidelines for the Protection of Marine Aquatic Life (BC MOE 2016, 2015a). When available, both 30-day average and maximum guidelines were used for comparison. Water quality data collected quarterly from 2013 through 2015 by the PRPA were used to supplement water quality data collected for the Project, using sites close to the Project. The six nearby PRPA sites selected for comparison were Fairview Terminal (Site 7; north east of the MOF), Philips Point (Site 29; north east of Berth 1), Harbour Entrance and North Ridley (Sites 8 and 9, respectively; both south of Berths 1 and 2), Tuck Island (Site 31; within the Berth 2 dredge footprint), and Casey Cove (Site 32, within the MOF dredge footprint).

None of the physical parameters, anions, and nutrients analyzed exceeded their BC MOE water quality guidelines. Of the 41 metals analyzed, 23 were below detection limits in all samples analyzed. All detectable metals were below BC MOE water quality guidelines, with the exception of boron and copper. Boron exceeded the BC MOE average guideline of 1.2 mg/L in all 12 samples collected (see Appendix 7, Table 7-1), ranging from 3.36 to 4.19 mg/L, within the range collected by the PRPA in nearby sites (2.10 to 4.52 mg/L; see Appendix 7, Table 7-4). Boron concentrations in Canadian coastal waters typically range from

3.7 to 4.3 mg/L (Health Canada 1990; Moss and Nagpal 2003). Copper exceeded the BC MOE average guideline of 0.002 mg/L in one sample at Berth 2 (measured at 0.00258 mg/L; see Appendix 7, Table 7-1).

Chlorophyll *a* concentrations, indicative of phytoplankton populations, ranged from below detection (0.010 µg/L) to 0.134 µg/L at water quality sample sites, with 6 of 12 samples analyzed below detection limits. All samples collected at Berth 1 had detectable levels of chlorophyll *a*, and concentrations were typically greater at the surface than at depth (see Appendix 7, Table 7-1). In general, chlorophyll *a* concentrations are expected to be lower in the winter (when sampling was conducted) than in spring and summer.

5.8.2 Water Clarity

Turbidity and secchi depth were measured in the field and total suspended solids (TSS) was measured in the laboratory. All three parameters provide indications of background water clarity in the study area. During future Project activities, TSS and turbidity can be monitored and compared to BC MOE and CCME water quality guidelines (BC MOE 2016, CCME 2002).

Surface and depth samples collected during both ebb and flow tides at all three sites had TSS levels below the detection limit (<2.0 mg/L; see Appendix 7, Table 7-1). Samples collected by the PRPA in winter (Q4 November 2014 and Q4 October 2015) at nearby sites also had TSS levels at or near the detection limit (see Appendix 7, Table 7-5).

Turbidity was low, ranging from 0.47 to 1.27 nephelometric turbidity units (NTU), for all locations (see Table 28), similar to the range reported for PRPA surveys (0.28-3.17 NTU) in nearby sites (see Appendix 7, Table 7-6).

Secchi depth provides an indication of water clarity and light penetration, with deeper secchi depths representing higher water clarity. Secchi depth ranged from 3.4 to 6.3 m during the December 2014 survey (see Table 28).

Table 28 Turbidity and Secchi Depth at Sample Sites in December 2014

Site ID	Location	Tide	Turbidity (NTU)		Secchi depth (m)
			Surface	Depth	
WQ_BA	Berth 1	Ebb	0.69	0.93	3.4
		Flood	0.99	0.68	5.0
WQ_BB	Berth 2	Ebb	0.70	0.95	6.3
		Flood	0.95	0.77	4.1
WQ_PM	MOF	Ebb	1.21	1.27	6.3
		Flood	0.47	1.05	4.9

NOTE:
Surface samples collected at 1 m from surface, and depth samples collected at 1 m from bottom, as noted in Appendix 7.

6 SUMMARY

Detailed sediment characterization was carried out at the three proposed dredge footprints (Berth 1, Berth 2, and the MOF). Data from 28 surface samples (0-0.07 m depth), 102 large interval core samples (0-1.5 m depth, divided into 0.5 m intervals), and 62 small interval core samples (0-1.0 m depth, divided into 0.2 m intervals), for a total of 192 samples, were collected to characterize physical parameters, metals, PAHs, PCBs, and PCDD/Fs in marine sediments.

Metals in sediment were below disposal at sea criteria except for arsenic and copper. Arsenic and copper data are consistent with other sediment metals data from the Prince Rupert area, and are indicative of naturally elevated levels of these metals in soils of the Skeena watershed. Sediment PAHs and PCBs were mostly below detectable levels and were below disposal at sea screening criteria in all samples. Sediment PCDD/Fs were present in surface samples, in some cases above the CCME ISQG. However, sediments in each of the three proposed Project dredge areas met all ECCC screening criteria for PCDD/Fs, and thus, are suitable for ocean disposal at a non-dispersive site. Sediment chemical data, when compared to CSR Schedule 7, Column II standards for potential land disposal, indicated that a CSRA would not be required if the sediments were disposed of at a non-agricultural, near-shore disposal site.

One-time water quality monitoring was conducted concurrent to sediment sampling at a location within each of the three proposed Project dredge footprints, and has been summarized with supplemental water quality monitoring data collected quarterly (since 2013) by the PRPA at six nearby sites. Of the physical parameters, anions, and nutrients analyzed in samples collected for the Project, no exceedances of the BC MOE water quality guidelines were noted, with the exception of copper (one sample) and boron (all samples). Boron values did, however, fall within the expected ranges for Canadian coastal waters and those measured at nearby PRPA monitoring sites. Water clarity was relatively high during monitoring at Project sites (in winter); TSS values at all sites during both ebb and flow tides were below detection limits, in situ turbidity ranged from 0.47 to 1.27 NTU, and secchi depth ranged from 3.4 to 6.3 m. Water clarity at sites monitored by the PRPA was similarly high during the winter season.

Sediment and water quality data will be used to support the EA process, provide context for future permitting requirements for potential disposal at sea, and contribute to a greater understanding of local baseline conditions from which environmental monitoring programs may be developed to support Project construction activities.

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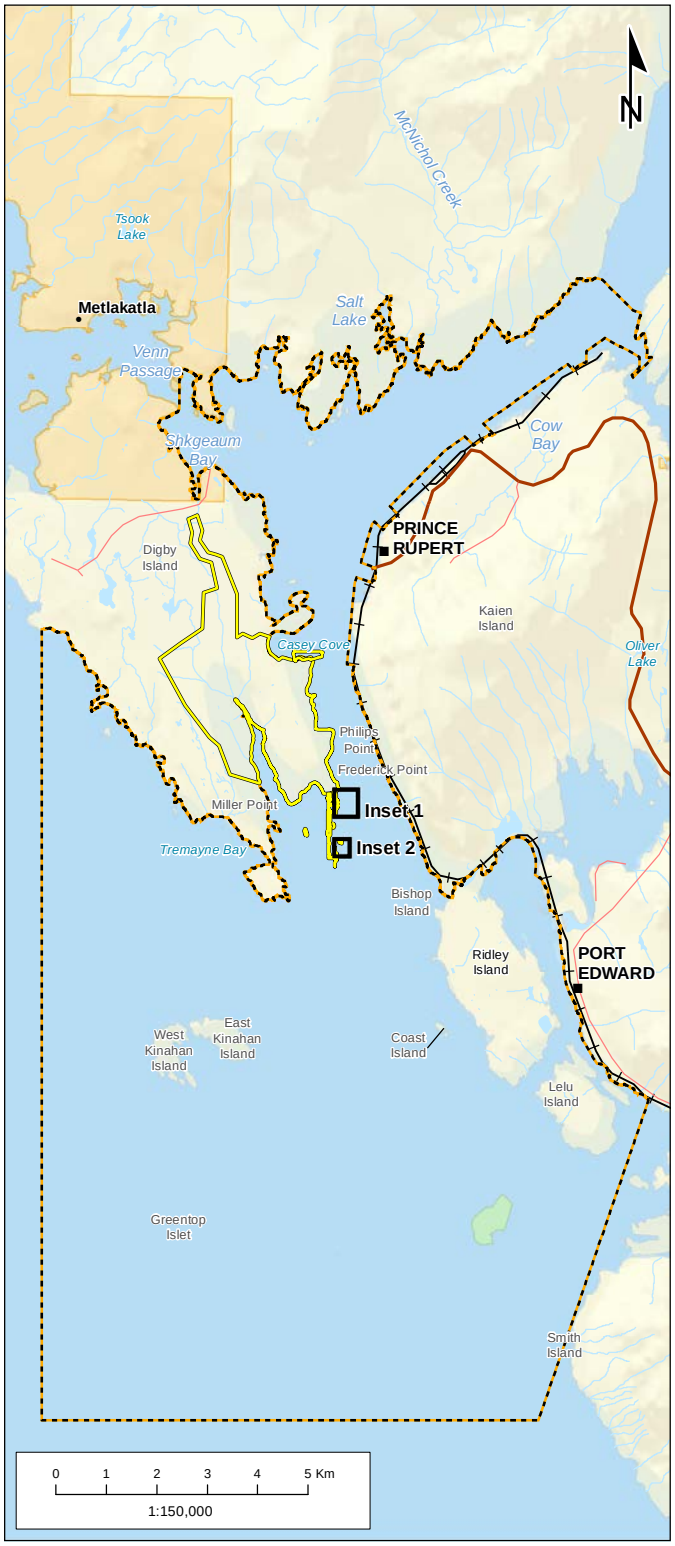
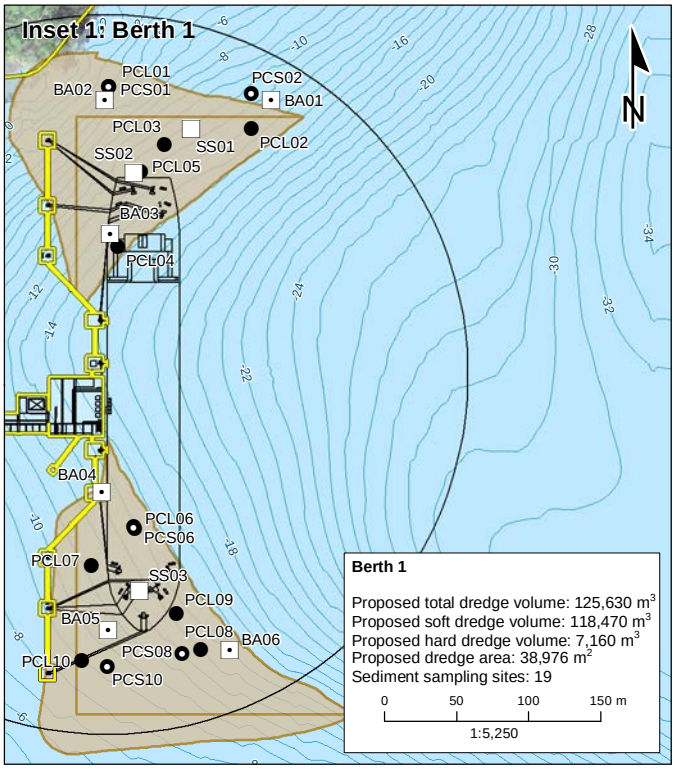
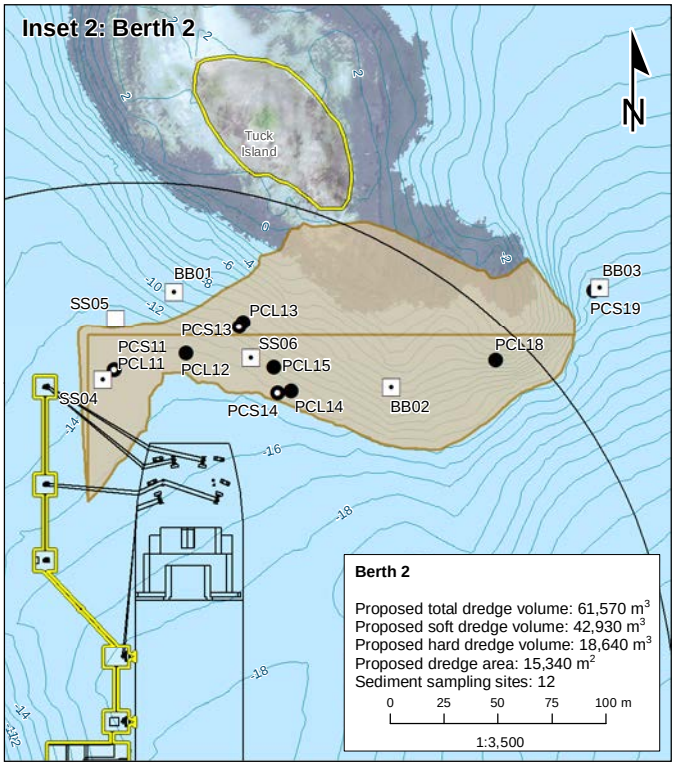
8 FIGURES

Please see the following pages.







- City, Municipality, or Town
- Community, Locality, or Village
- Highway
- Road
- Railway
- Watercourse
- Bathymetric Contour
- Park, Protected Area, Ecological Reserve, or Conservancy
- First Nation Reserve
- Waterbody
- Prince Rupert Port Authority Boundary
- Project Component
- Project Development Area
- Dredge Area

Sediment Cores

- Vibracore - Primary Core Large (PCL; 0.5m) Interval Core Sample Site
- Vibracore - Primary Core Small (PCS; 0.2m) Interval Core Sample Site (Analysis Includes Dioxins and Furans)*

Surface Sediment Samples

- Surface Grab (Analysis Includes Dioxins and Furans)
- Surface Grab

*Note: Not included in sediment sample sites count.

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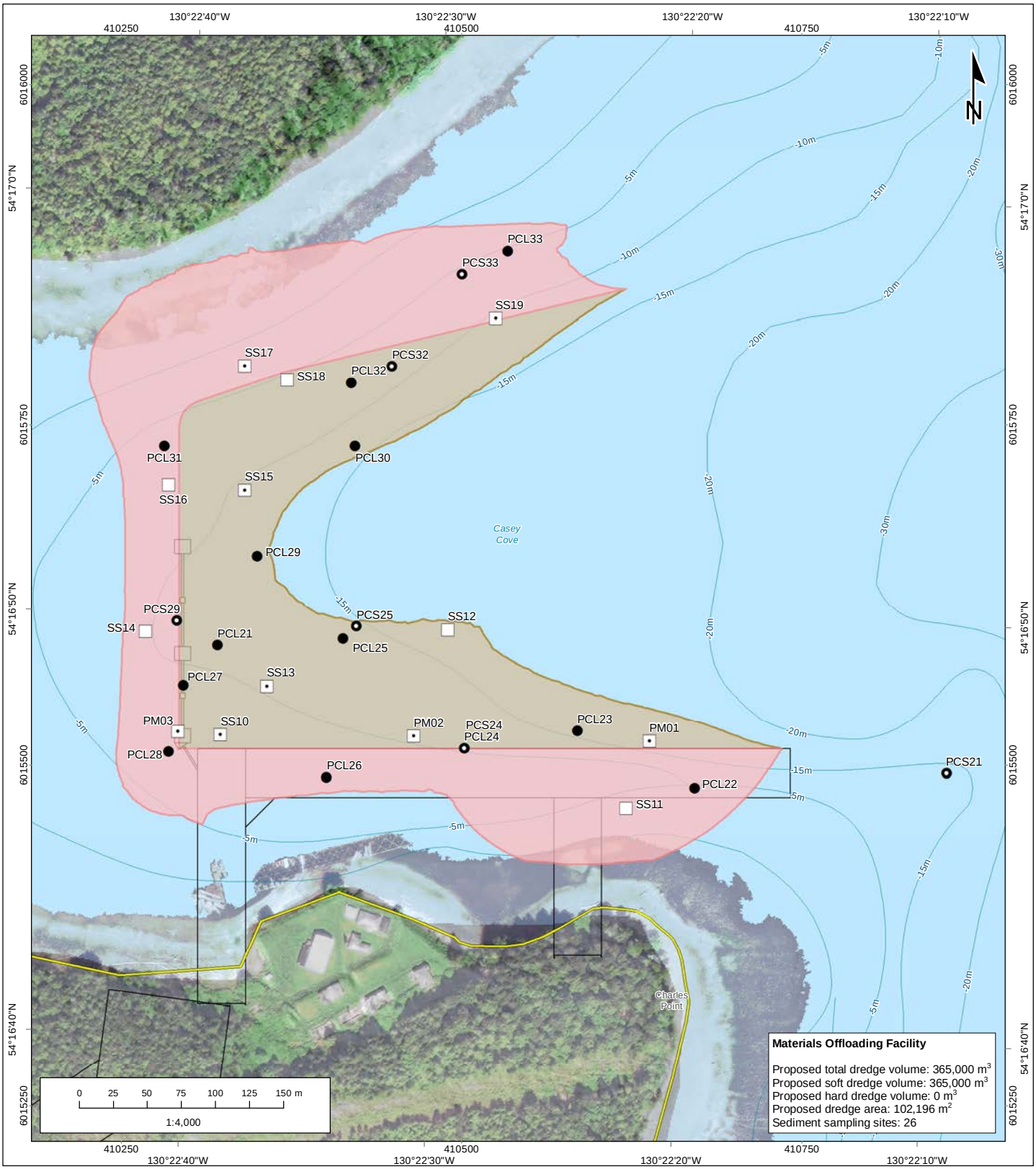
MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

BERTH AREAS DETAILED SEDIMENT QUALITY INVESTIGATION

Projection:UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 12, 2016	Drawn By: RC Checked By: SD	FIGURE NO: 1



Bathymetric Contour
Waterbody
Project Component
Terrestrial Portion of the Project Development Area

Proposed Dredge Area Footprint
Dredge Basin (-15m CD)
Dredge Side Slope (5H:1V)

Sediment Cores
Vibracore - Primary Core Large (PCL; 0.5m) Interval Core Sample Site
Vibracore - Primary Core Small (PCS; 0.2m) Interval Core Sample Site (Analysis Includes Dioxins and Furans)*

Surface Sediment Samples
Surface Grab (Analysis Includes Dioxins and Furans)
Surface Grab

*Note: Not included in sediment sample sites count.

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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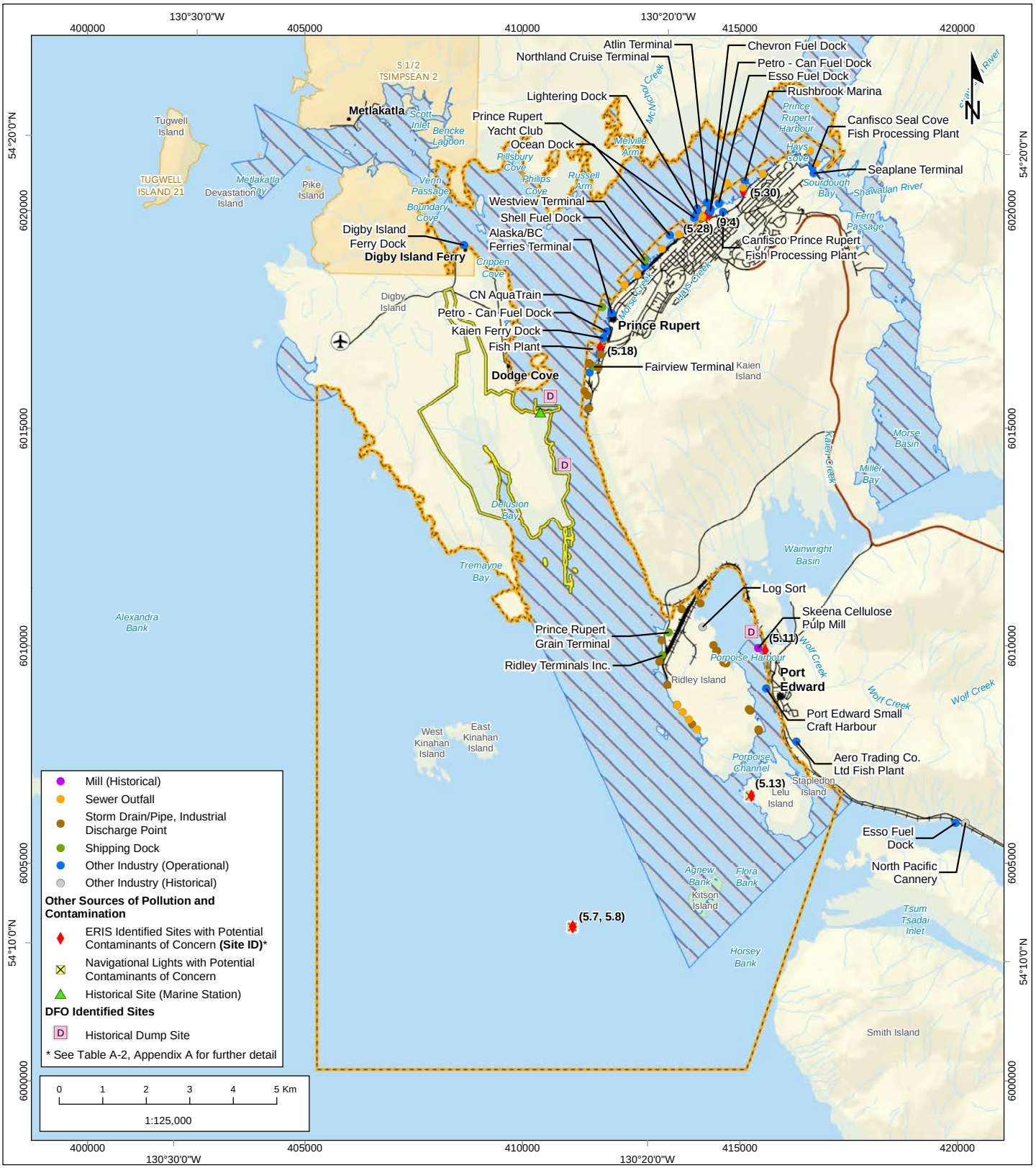
MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

MATERIALS OFFLOADING FACILITY AREA DETAILED SEDIMENT QUALITY INVESTIGATION

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID: 123220054 Date: Oct 12, 2016	Drawn By: RC Checked By: SD	FIGURE NO: 2



City, Municipality, or Town
Community, Locality, or Village
Airport
Highway
Road
Railway
Watercourse
Park, Protected Area, Ecological Reserve, or Conservancy
First Nation Reserve
Waterbody
Prince Rupert Port Authority Boundary
Project Development Area
Proposed Dredge Area Footprint
Shellfish Sanitary Closure Area

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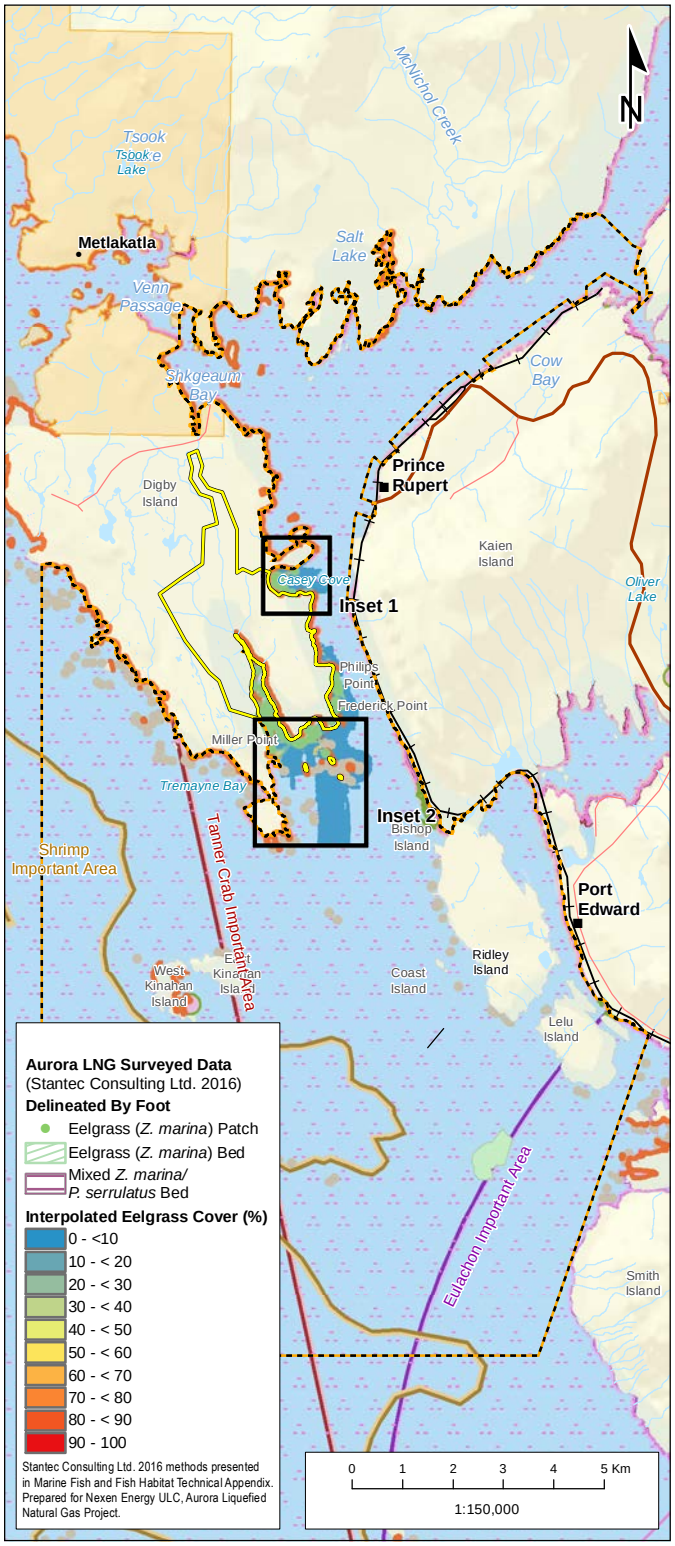
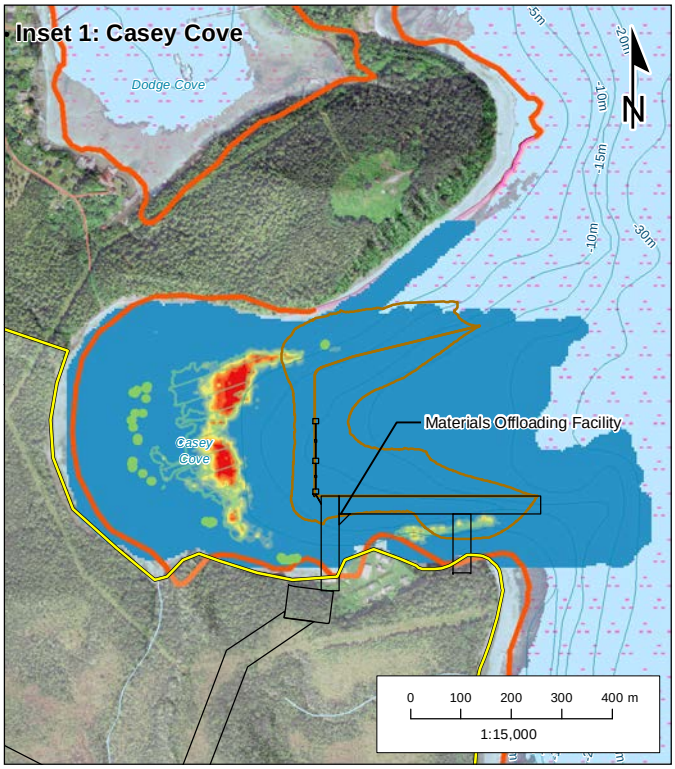
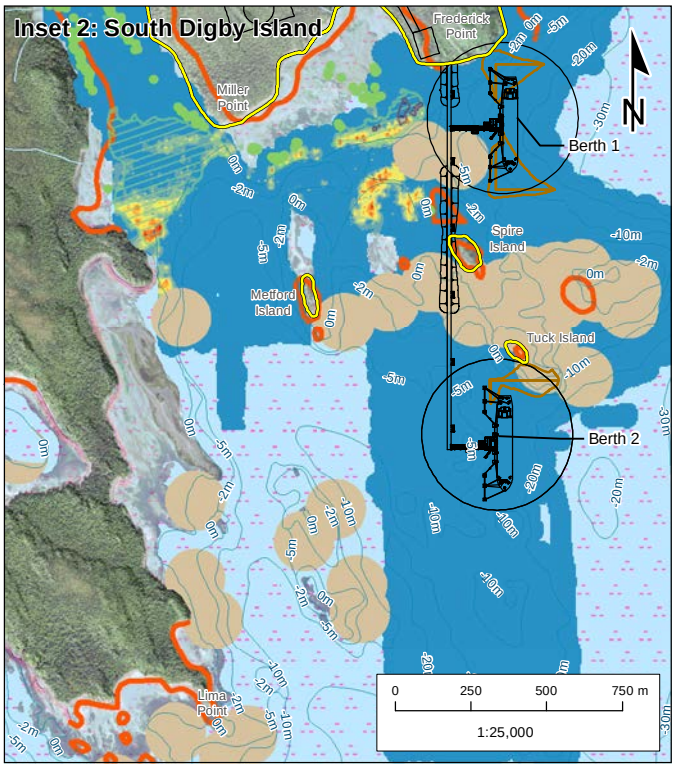
MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

FACTORS INFLUENCING LOAD SITE MATERIAL QUALITY

Projection:UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Sep 01, 2016	Drawn By: RC Checked By: SD	FIGURE NO: **3**







City, Municipality, or Town
Highway
Road
Railway
Watercourse
Bathymetric Contour
Park, Protected Area, Ecological Reserve, or Conservancy
First Nation Reserve
Waterbody
Prince Rupert Port Authority Boundary
Project Component
Terrestrial Portion of the Project Development Area
Dredge Area

BCMCA (2016)
Eelgrass Biobands, 1995-2002
Eelgrass Bed

GeoBC CRIMS Data (FLNRO 2016)
Kelp Bed

DFO Delineated Important Areas (DFO 2016)
Shrimp
Dungeness Crab
Eulachon
Tanner Crab

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission, Ministry of Forests, Lands and Natural Resource Operations (FLNRO) 2016, Coastal Resource Information Management System (CRIMS), British Columbia Marine Conservation Analysis (BCMCA) 2016. Government of Canada:CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada (DFO), Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC. Stantec Consulting Ltd 2016: Marine Fish and Fish Habitat Technical Appendix.Service Layer Credits: Copyright:© 2014 Esri

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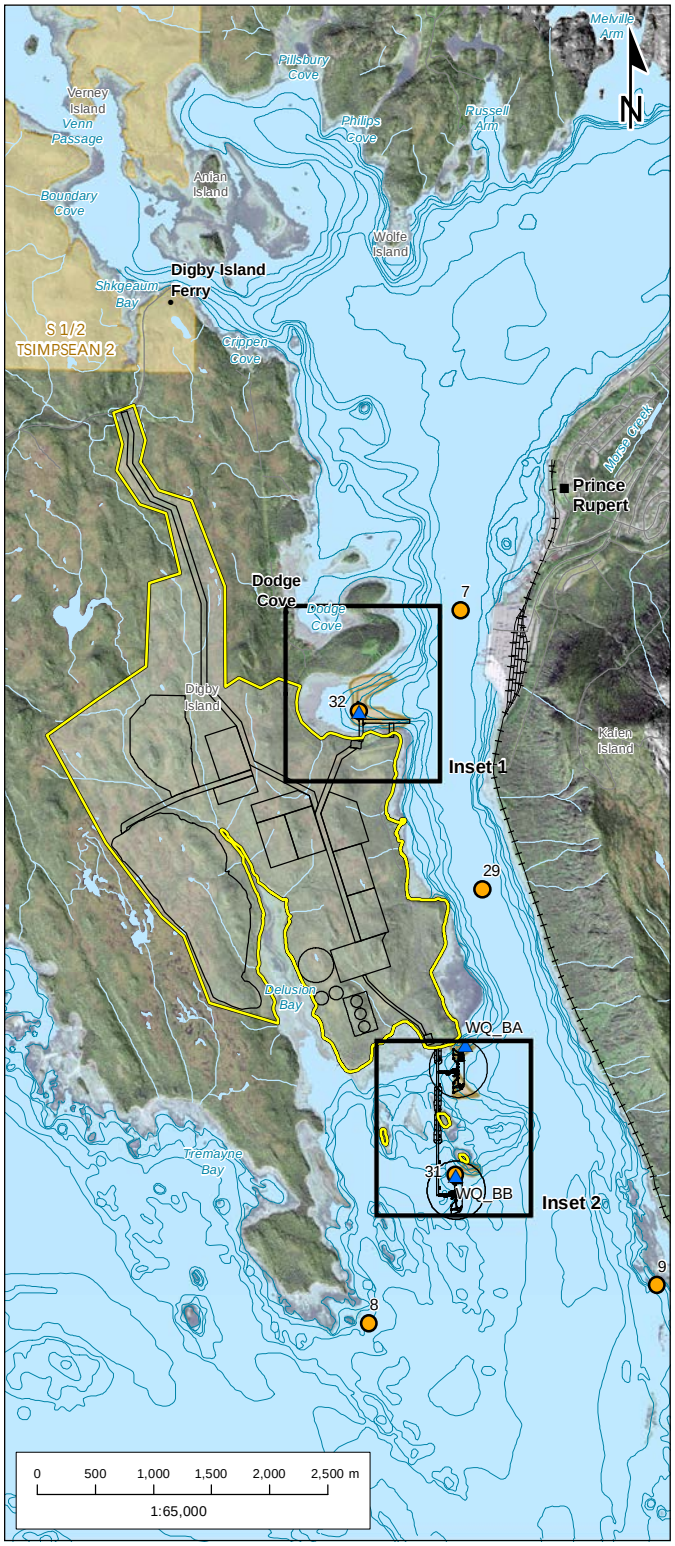
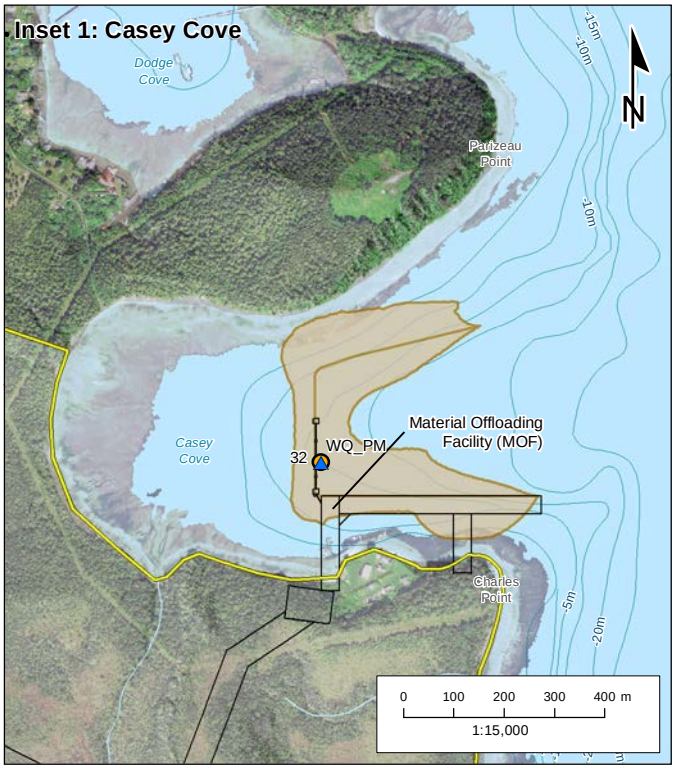
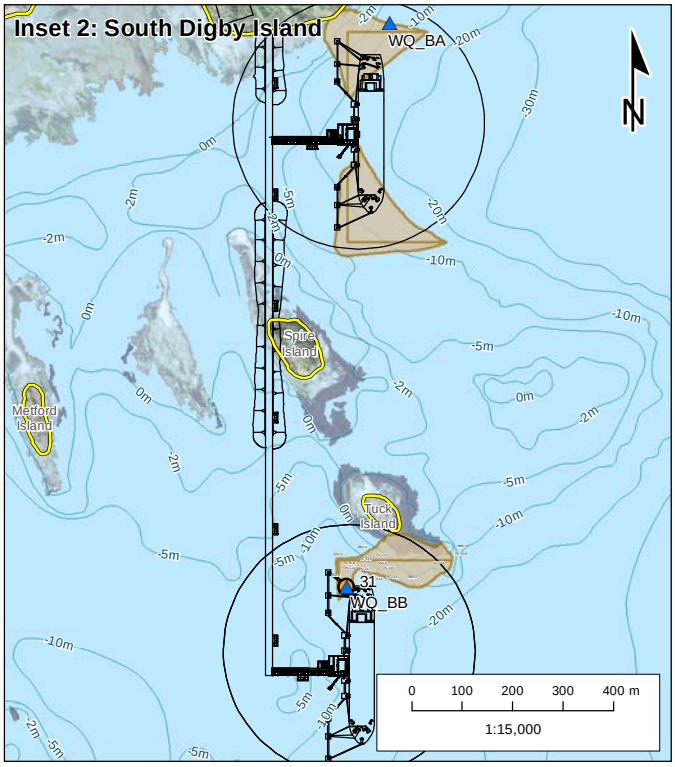
MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

IMPORTANT ECOLOGICAL FEATURES OF THE PROJECT AREA

Projection:UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 12, 2016	Drawn By: RC Checked By: SD	FIGURE NO: 4







- City, Municipality, or
- Community, Locality, or Village
- Road
- Railway
- Watercourse
- Bathymetric Contour
- First Nation Reserve
- Waterbody
- Project Component
- Terrestrial Portion of the Project Development Area
- Dredge Area
- Aurora Water Quality Monitoring Stations
- Prince Rupert Port Authority Water Quality Monitoring Stations

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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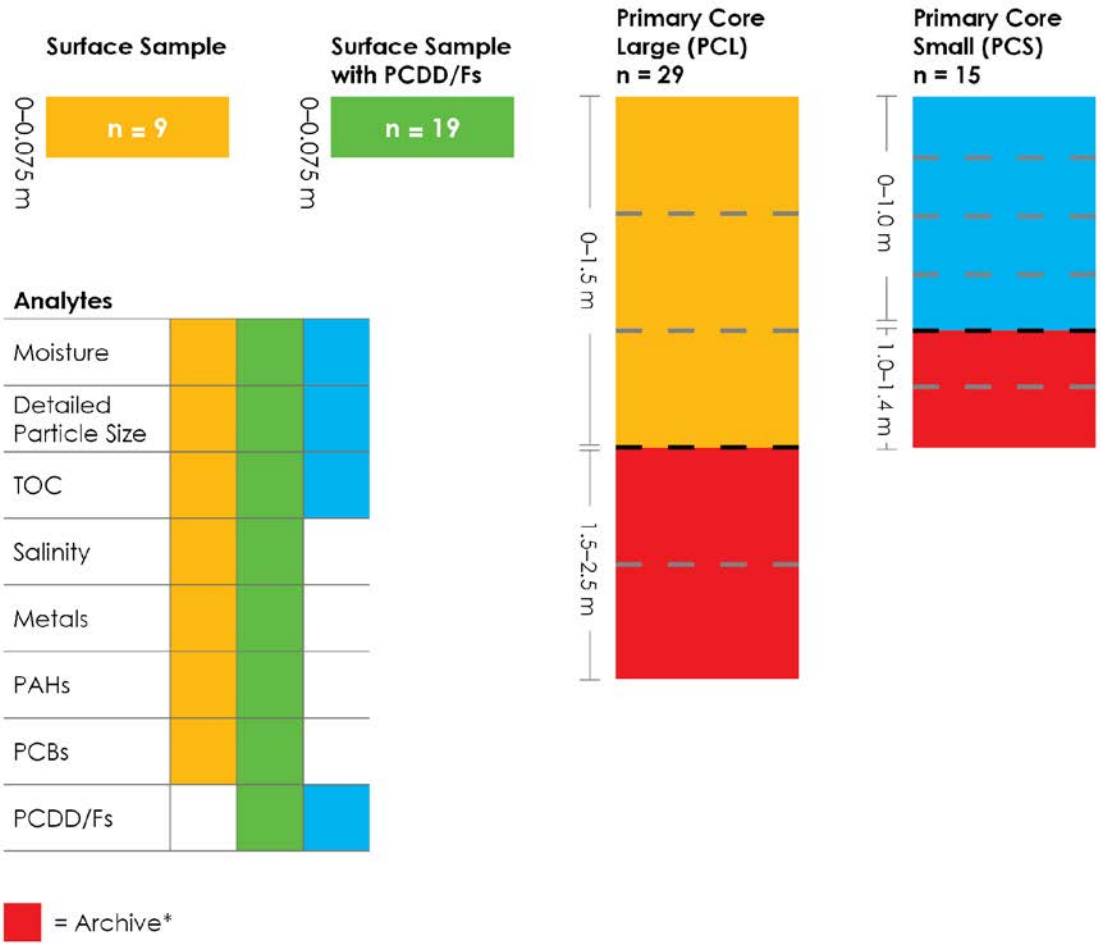
MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

WATER QUALITY MONITORING STATIONS

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID: 123220054 Date: Oct 12, 2016	Drawn By: RC Checked By: SD	FIGURE NO:	5

Marine Sediment Sample Types



PCDD/F - polychlorinated dibenzodioxin/dibenzofuran
TOC - total organic carbon
PAH - polycyclic aromatic hydrocarbon
PCB - polychlorinated biphenyl
n - number of surface grabs or core samples collected across all sample sites

*Note: Archived PCL samples were analyzed for detailed particle size analysis and moisture. In cases where the deepest samples exceeded sediment quality guidelines for a specific analyte, archived samples were further analyzed for that analyte only.

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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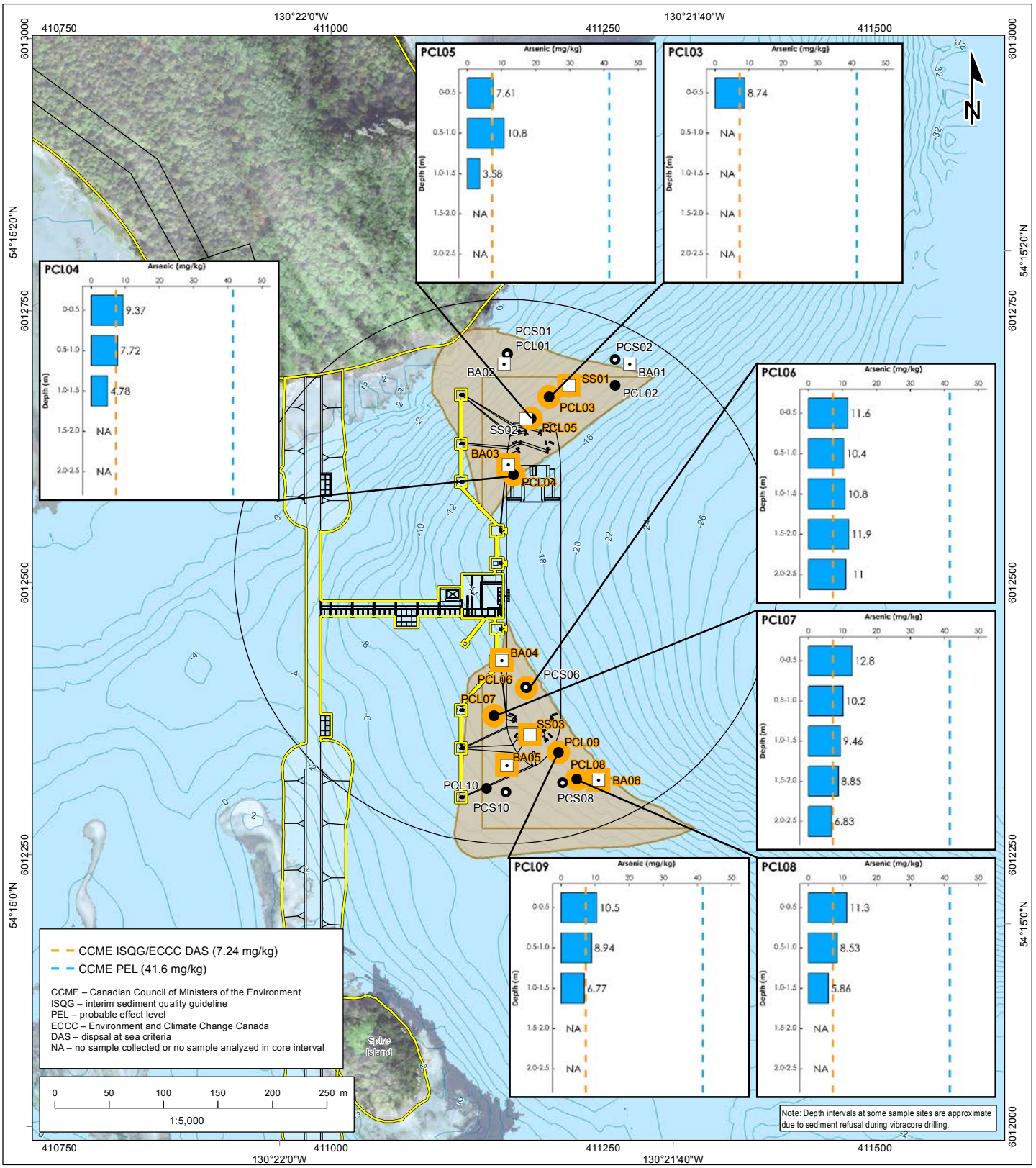
MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

MARINE SEDIMENT SAMPLE TYPES

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Sep 02, 2016	Drawn By: RC Checked By: SD	FIGURE NO: 6



Bathymetric Contour
Waterbody
Project Component
Project Development Area
Dredge Area

Sample or Mean Core Concentration is Greater Than CCME ISQG/ECCC DAS (7.24 mg/kg)

Sediment Cores

- Vibracore - Primary Core Large (PCL; 0.5m) Interval Core Sample Site
- Vibracore - Primary Core Small (PCS; 0.2m) Interval Core Sample Site (Analysis Includes Dioxins and Furans)

Surface Sediment Samples

- Surface Grab (Analysis Includes Dioxins and Furans)
- Surface Grab

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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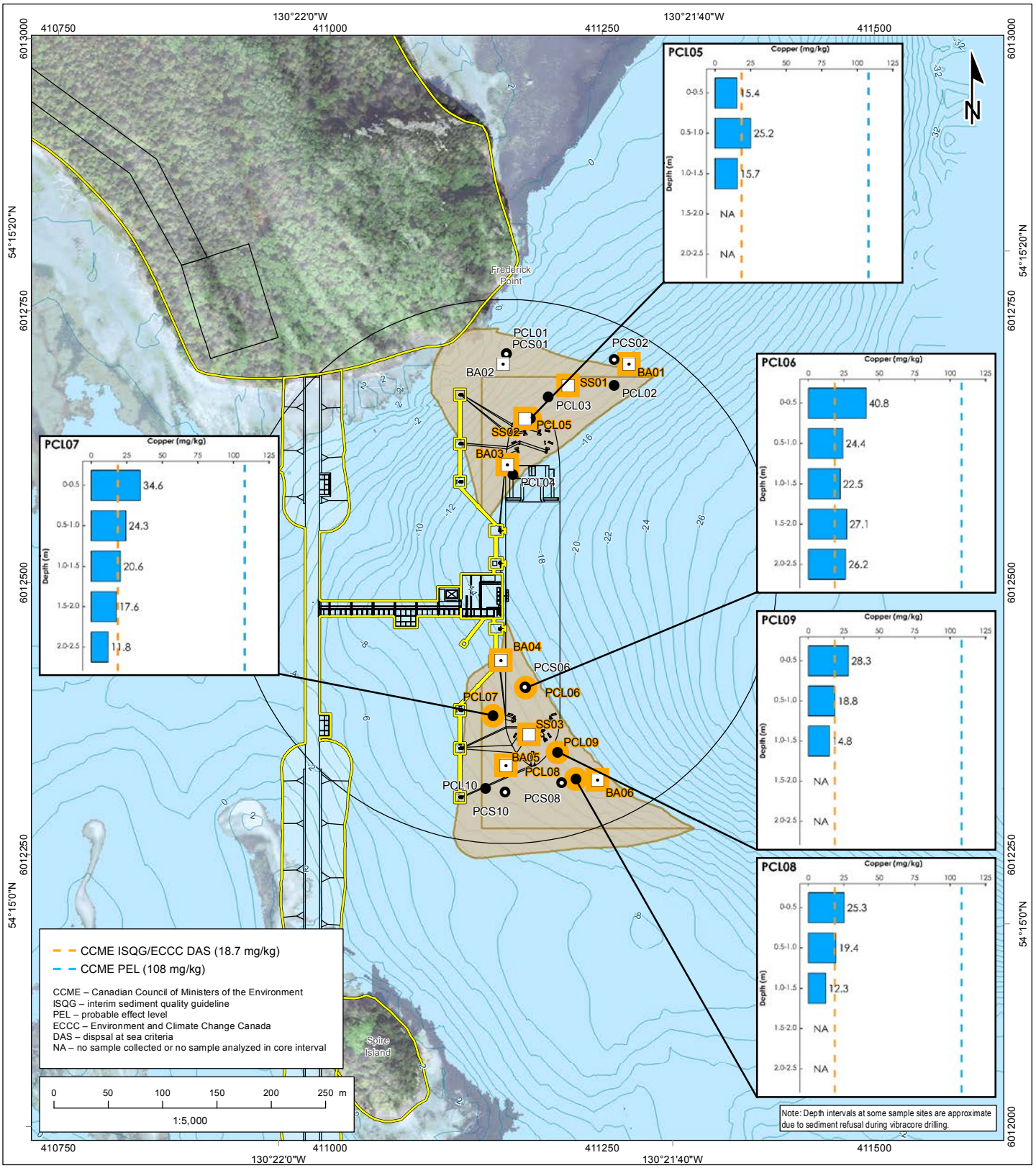
MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

ARSENIC CONCENTRATIONS BERTH 1

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Sep 02, 2016	Drawn By: RC Checked By: SD	FIGURE NO:	7



Bathymetric Contour
Waterbody
Project Component
Project Development Area
Dredge Area

Individual Surface Sample or Mean Core Concentration is Greater Than CCME ISQG/ECCC DAS (18.7 mg/kg)

Sediment Cores

- Vibracore - Primary Core Large (PCL; 0.5m) Interval Core Sample Site
- Vibracore - Primary Core Small (PCS; 0.2m) Interval Core Sample Site (Analysis Includes Dioxins and Furans)

Surface Sediment Samples

- Surface Grab (Analysis Includes Dioxins and Furans)
- Surface Grab

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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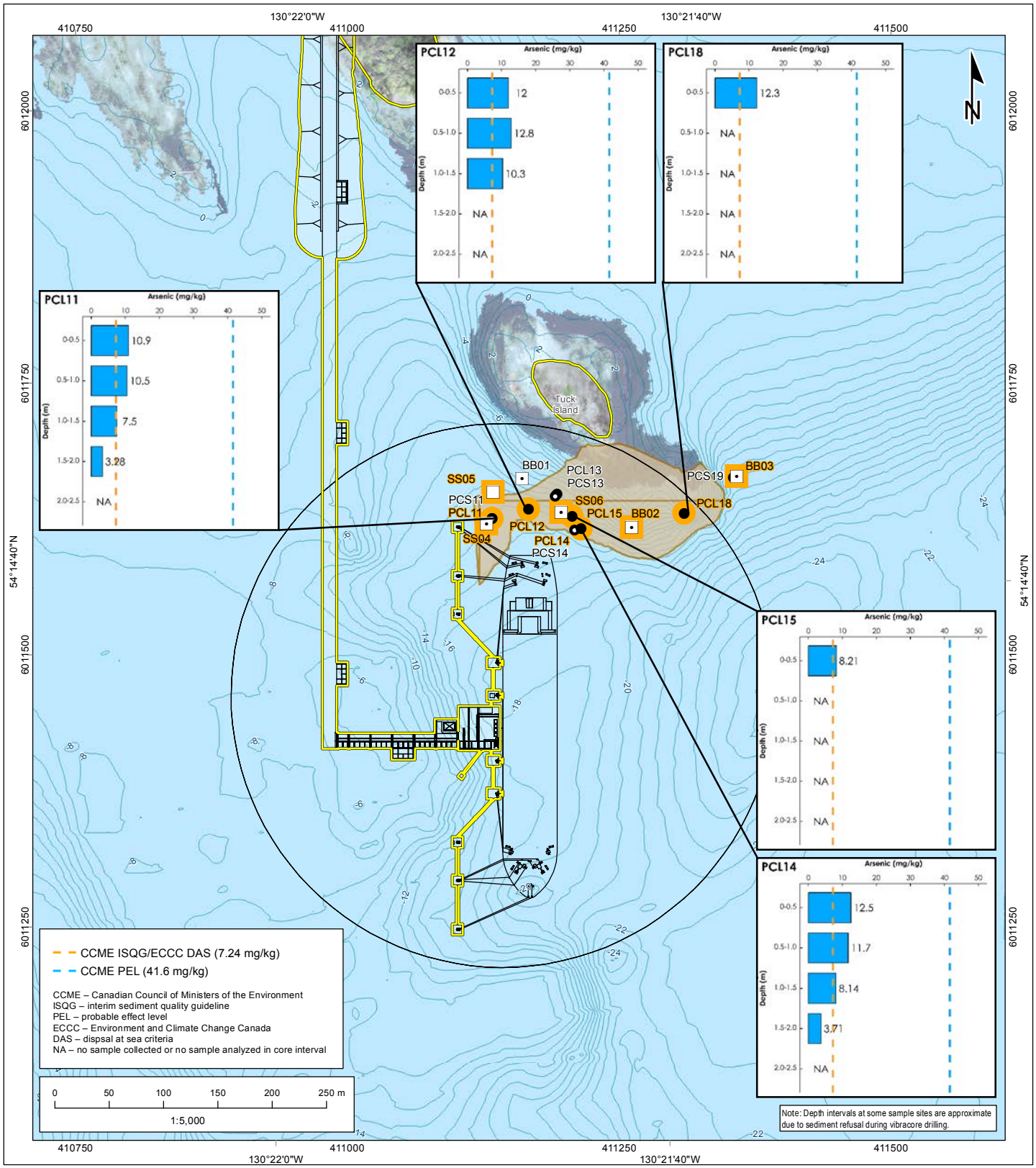
MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

COPPER CONCENTRATIONS BERTH 1

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Sep 02, 2016	Drawn By: RC Checked By: SD	FIGURE NO: 8



Bathymetric Contour
Waterbody
Project Component
Project Development Area
Dredge Area

Sample or Mean Core Concentration is Greater Than CCME ISQG/ECCC DAS (7.24 mg/kg)

Sediment Cores

- Vibracore - Primary Core Large (PCL; 0.5m) Interval Core Sample Site
- Vibracore - Primary Core Small (PCS; 0.2m) Interval Core Sample Site (Analysis Includes Dioxins and Furans)

Surface Sediment Samples

- Surface Grab (Analysis Includes Dioxins and Furans)
- Surface Grab

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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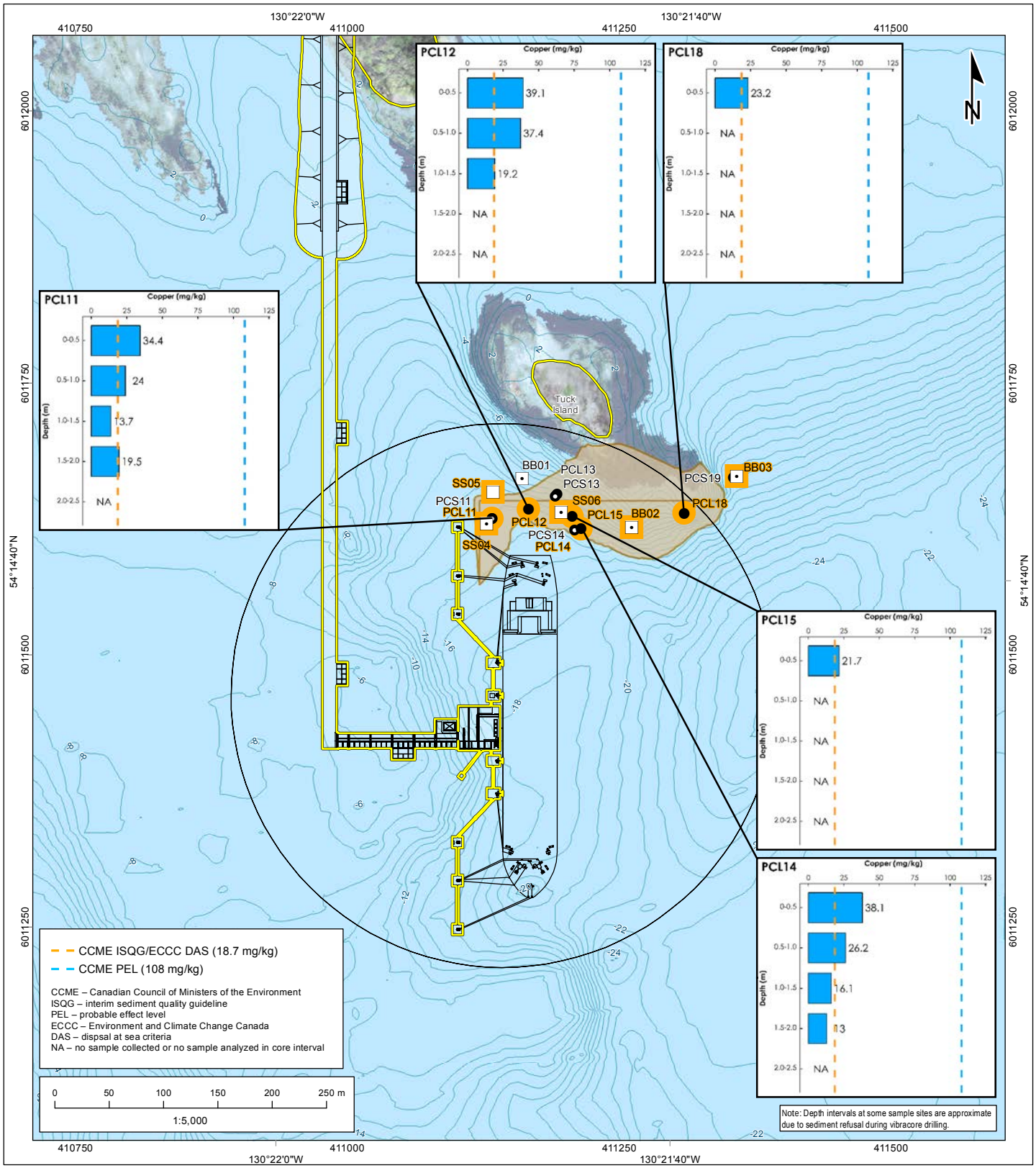
MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

ARSENIC CONCENTRATIONS BERTH 2

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Sep 02, 2016	Drawn By: RC Checked By: SD	FIGURE NO:	9



Bathymetric Contour
Waterbody
Project Development Area
Dredge Area

Individual Surface Sample or Mean Core Concentration is Greater Than CCME ISQG/ECCC DAS (18.7 mg/kg)

Sediment Cores

- Vibracore - Primary Core Large (PCL; 0.5m) Interval Core Sample Site
- Vibracore - Primary Core Small (PCS; 0.2m) Interval Core Sample Site (Analysis Includes Dioxins and Furans)

Surface Sediment Samples

- Surface Grab (Analysis Includes Dioxins and Furans)
- Surface Grab

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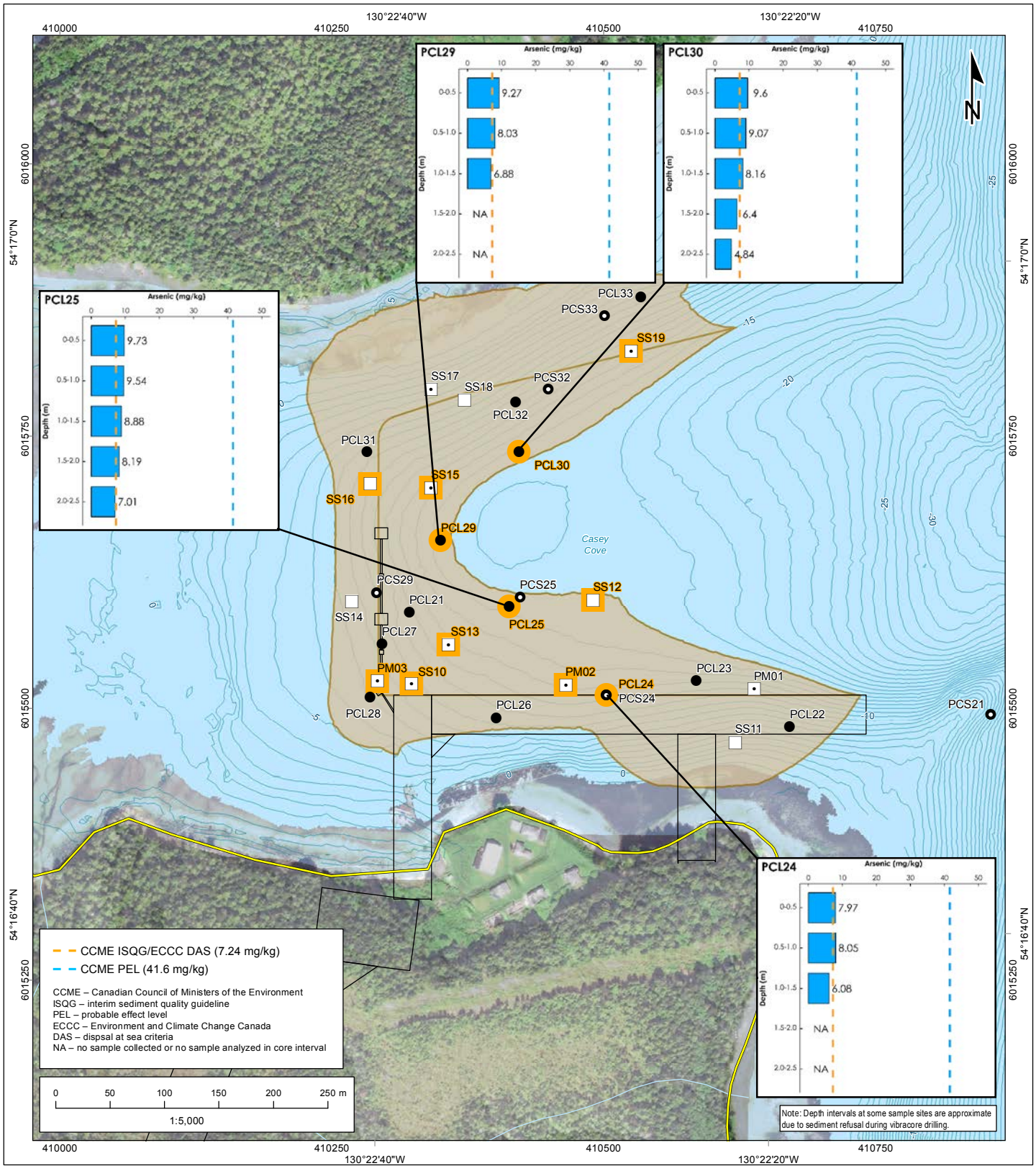
MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

COPPER CONCENTRATIONS BERTH 2

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Sep 02, 2016	Drawn By: RC Checked By: SD	FIGURE NO:	**10**



Watercourse
Bathymetric Contour
Waterbody
Project Component
Terrestrial Portion of the Project Development Area
Dredge Area

Sample or Mean Core Concentration is Greater Than CCME ISQG/ECCC DAS (7.24 mg/kg)

Sediment Cores

- Vibracore - Primary Core Large (PCL; 0.5m) Interval Core Sample Site
- Vibracore - Primary Core Small (PCS; 0.2m) Interval Core Sample Site (Analysis Includes Dioxins and Furans)

Surface Sediment Samples

- Surface Grab (Analysis Includes Dioxins and Furans)
- Surface Grab

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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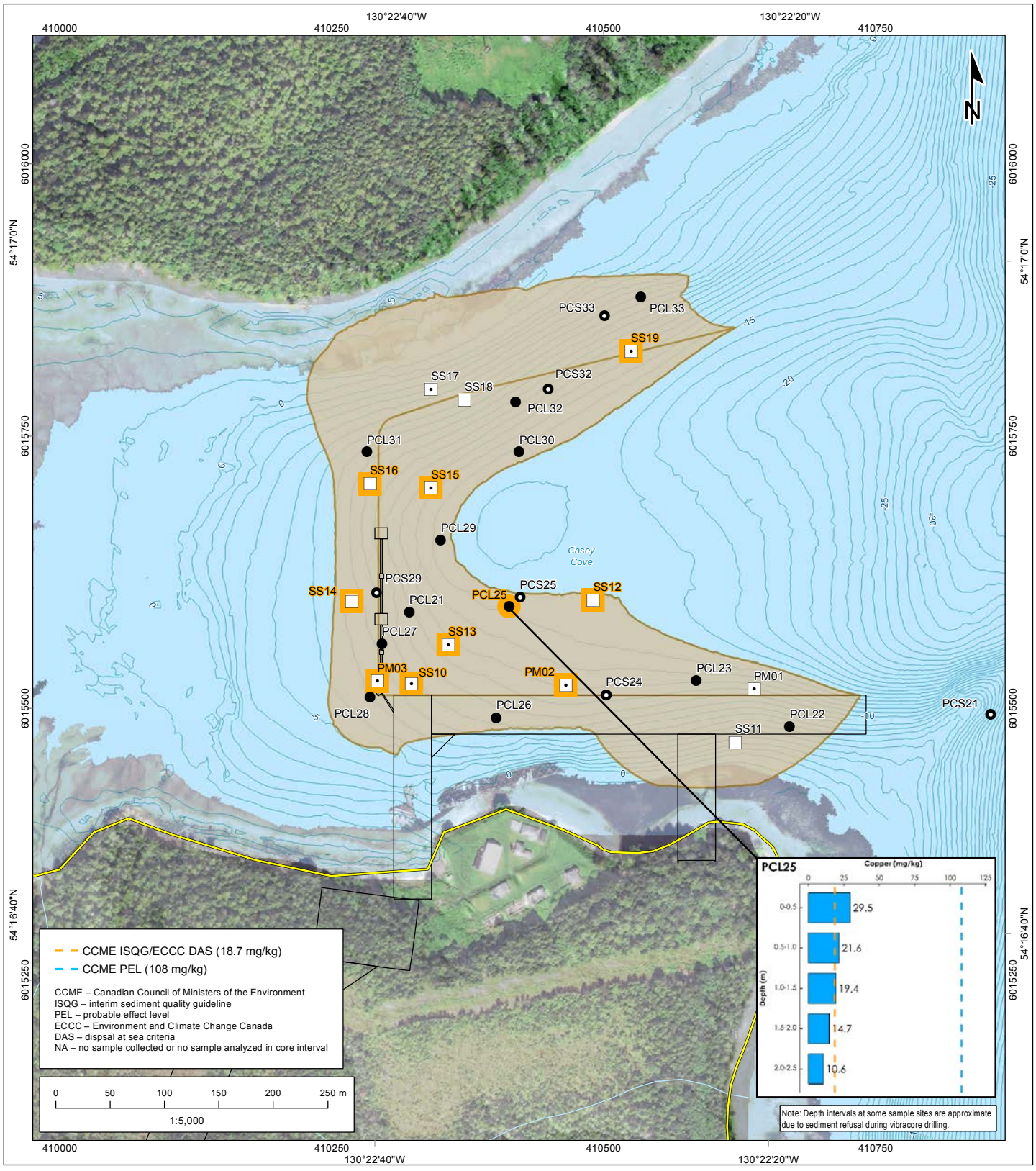
MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

ARSENIC CONCENTRATIONS MOF

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 12, 2016	Drawn By: RC Checked By: SD	FIGURE NO:	11



Watercourse
Bathymetric Contour
Waterbody
Project Component
Terrestrial Portion of the Project Development Area
Dredge Area

Individual Surface Sample or Mean Core Concentration is Greater Than CCME ISQG/ECCC DAS (18.7 mg/kg)

Sediment Cores

- Vibracore - Primary Core Large (PCL; 0.5m) Interval Core Sample Site
- Vibracore - Primary Core Small (PCS; 0.2m) Interval Core Sample Site (Analysis Includes Dioxins and Furans)

Surface Sediment Samples

- Surface Grab (Analysis Includes Dioxins and Furans)
- Surface Grab

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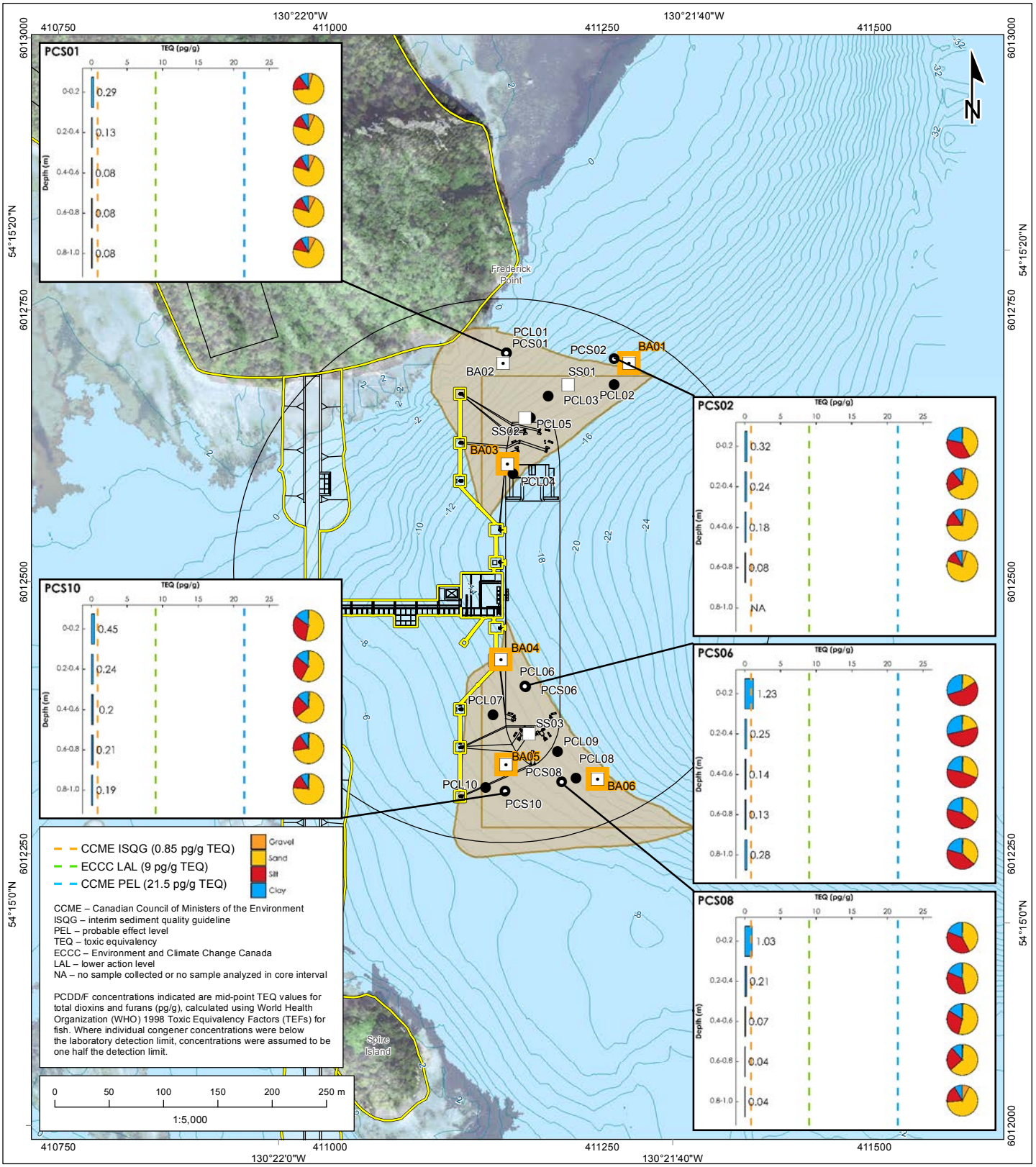
MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

COPPER CONCENTRATIONS MOF

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 12, 2016	Drawn By: RC Checked By: SD	FIGURE NO:	12



Bathymetric Contour
Waterbody
Project Component
Project Development Area
Dredge Area

Individual Surface Sample or Mean Core Concentration is Greater Than CCME ISQG (0.85 pg/g TEQ)

Sediment Cores

- Vibracore - Primary Core Large (PCL; 0.5m) Interval Core Sample Site
- Vibracore - Primary Core Small (PCS; 0.2m) Interval Core Sample Site (Analysis Includes Dioxins and Furans)

Surface Sediment Samples

- Surface Grab (Analysis Includes Dioxins and Furans)
- Surface Grab

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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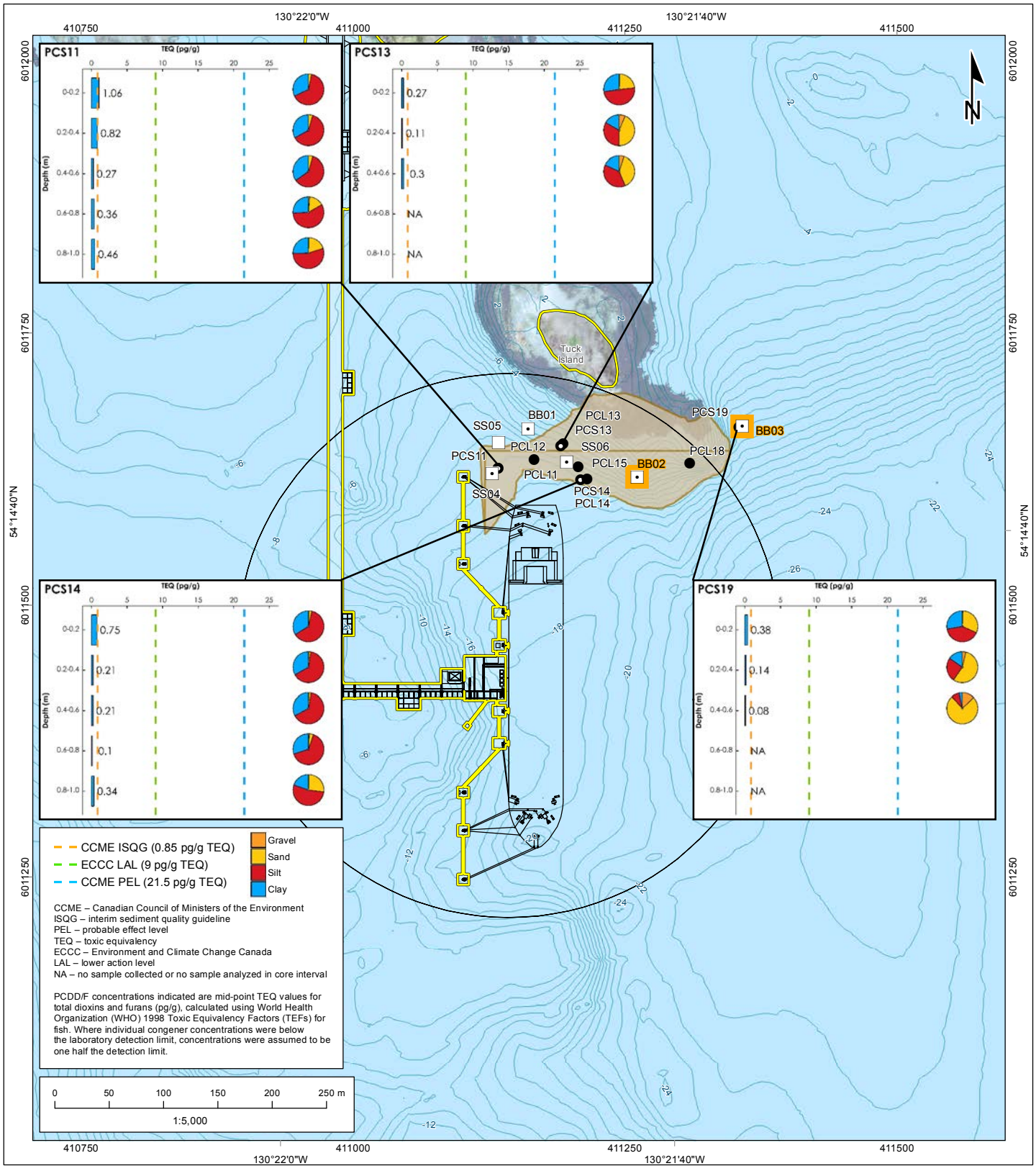
MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

PCDD/F CONCENTRATIONS BERTH 1

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Sep 02, 2016	Drawn By: RC Checked By: SD	FIGURE NO:	13



Bathymetric Contour
Waterbody
Project Development Area
Dredge Area

Individual Surface Sample or Mean Core Concentration is Greater Than CCME ISQG (0.85 pg/g TEQ)

Sediment Cores

- Vibracore - Primary Core Large (PCL; 0.5m) Interval Core Sample Site
- Vibracore - Primary Core Small (PCS; 0.2m) Interval Core Sample Site (Analysis Includes Dioxins and Furans)

Surface Sediment Samples

- Surface Grab (Analysis Includes Dioxins and Furans)
- Surface Grab

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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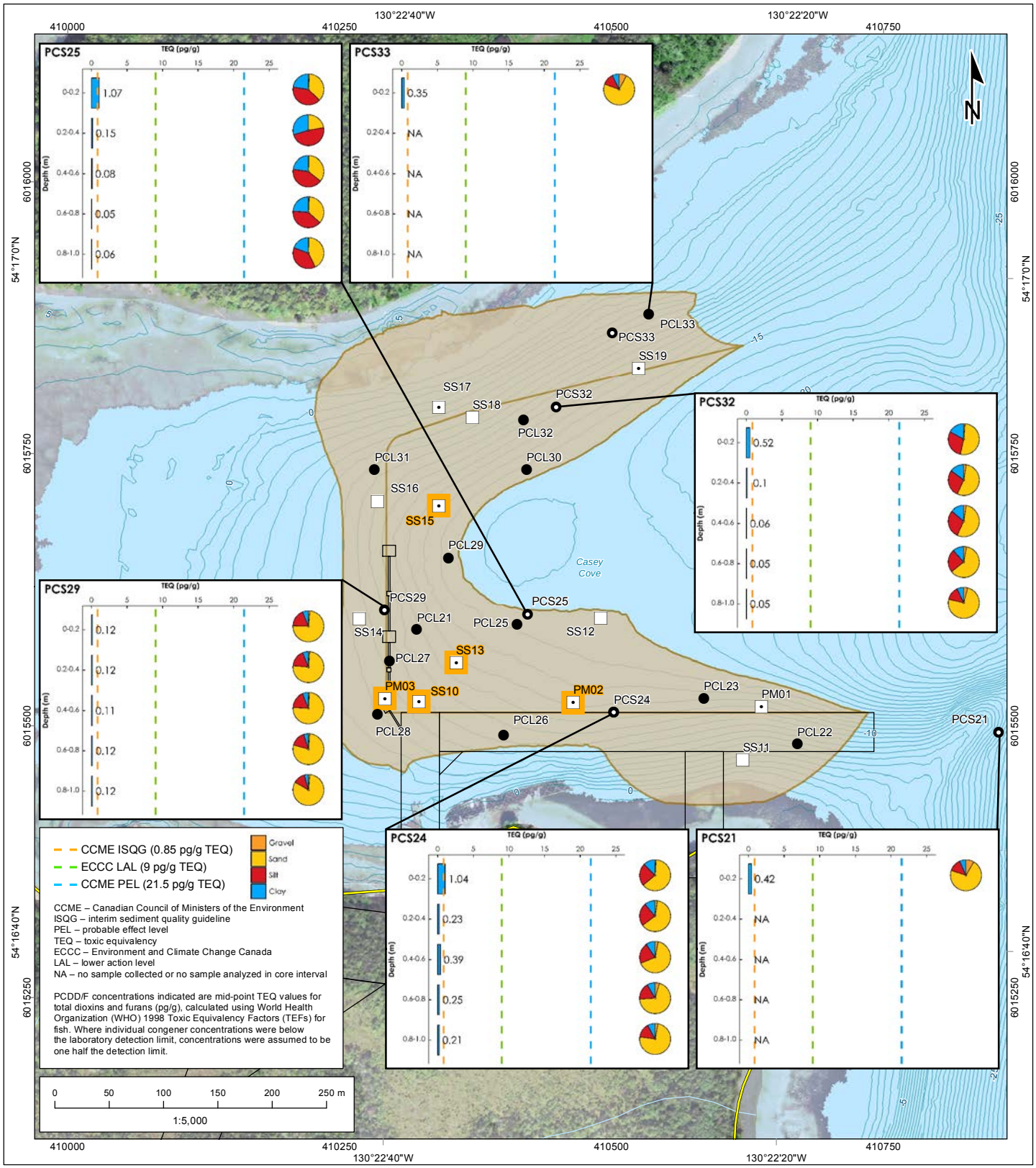
MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

PCDD/F CONCENTRATIONS BERTH 2

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Sep 02, 2016	Drawn By: RC Checked By: SD	FIGURE NO:	14



Watercourse
Bathymetric Contour
Waterbody
Project Component
Terrestrial Portion of the Project Development Area
Dredge Area

Individual Surface Sample or Mean Core Concentration is Greater Than CCME ISQG (0.85 pg/g TEQ)

Sediment Cores

- Vibracore - Primary Core Large (PCL; 0.5m) Interval Core Sample Site
- Vibracore - Primary Core Small (PCS; 0.2m) Interval Core Sample Site (Analysis Includes Dioxins and Furans)

Surface Sediment Samples

- Surface Grab (Analysis Includes Dioxins and Furans)
- Surface Grab

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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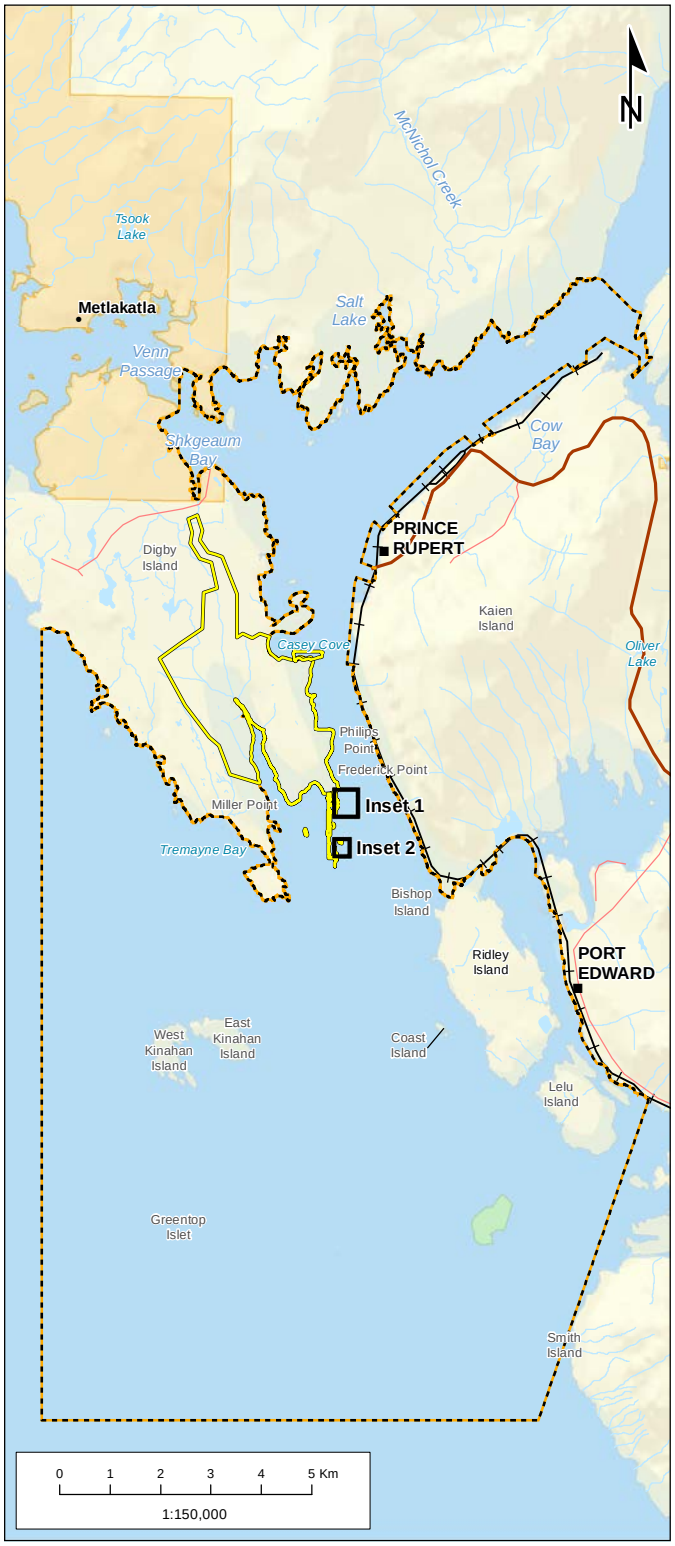
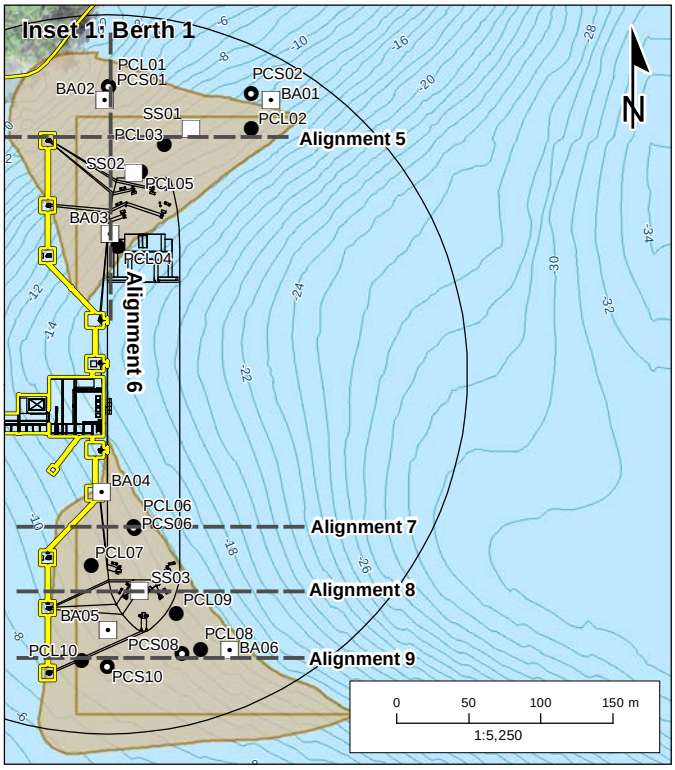
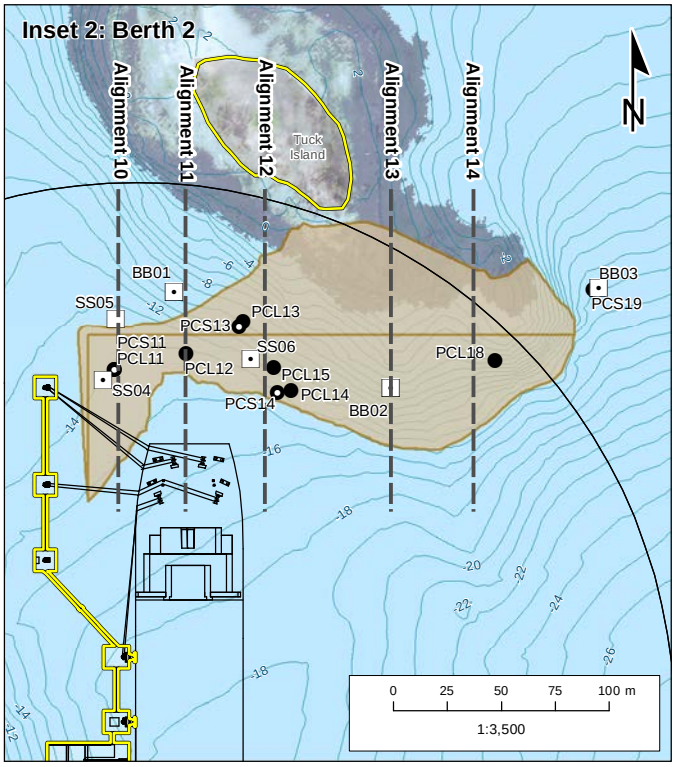
MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

PCDD/F CONCENTRATIONS MOF

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 12, 2016	Drawn By: RC Checked By: SD	FIGURE NO:	**15**







- City, Municipality, or Town
- Community, Locality, or Village
- Highway
- Road
- Railway
- Watercourse
- Bathymetric Contour
- Park, Protected Area, Ecological Reserve, or Conservancy
- First Nation Reserve
- Waterbody
- Prince Rupert Port Authority Boundary
- Project Component
- Project Development Area
- Dredge Area
- Profile

Sediment Cores

- Vibracore - Primary Core Large (PCL; 0.5m) Interval Core Sample Site
- Vibracore - Primary Core Small (PCS; 0.2m) Interval Core Sample Site (Analysis Includes Dioxins and Furans)

Surface Sediment Samples

- Surface Grab (Analysis Includes Dioxins and Furans)
- Surface Grab

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.Service Layer Credits: Copyright © 2014 Esri

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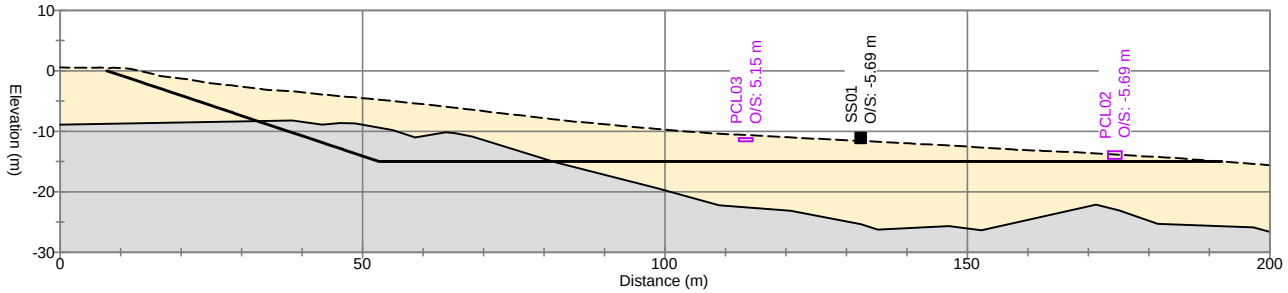
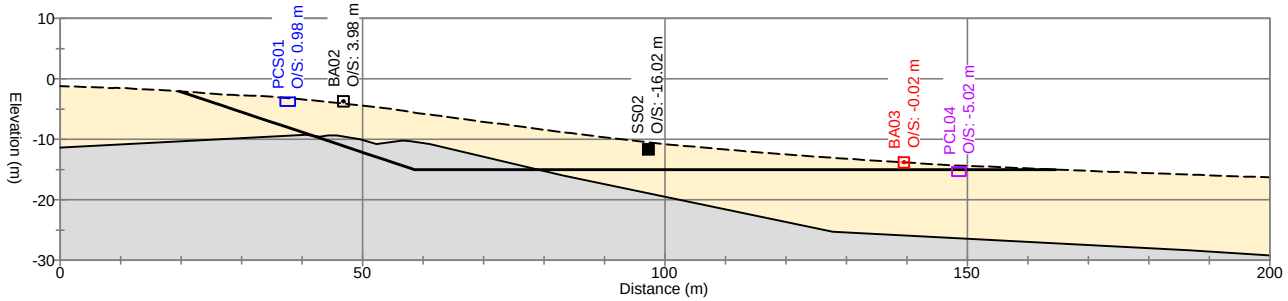
MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

BERTH AREAS ALIGNMENT LOCATIONS FOR VERTICAL PROFILES

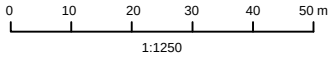
Projection: UTM Zone 9 Datum: NAD 83	Fig. ID: 123220054 Date: Oct 11, 2016	Drawn By: RC Checked By: SD	FIGURE NO:	**16**



Profile View of Alignment 5



Profile View of Alignment 6



Seabed
Dredge Surface
Estimated Sediment
Estimated Bedrock
Individual Surface Sample or Mean Core Concentration >CCME ISQG (0.85 pg/g)
O/S Offset from Alignment

Sediment Core

Vibracore Sample Depth - Primary Core Large (PCL; 0.5 m) Interval Core Sample Site

Vibracore Sample Depth - Primary Core Small (PCS; 0.2 m) Interval Core Sample Site (Analysis Includes Dioxins and Furans)

Surface Sediment Samples

Surface Grab

Surface Grab (Analysis Includes Dioxins and Furans)

CCME Canadian Coucil of Ministers of the Environment

ISQG Interim Sediment Quality Guideline

TEQ Toxic Equivalency

***Note:** Units in pg/g TEQ

Data Sources: Sub-bottom Profiling Data from Golder Hydrographic and Marine Geophysical Surveys for Nexen Aurora LNG Report, Reference Number: 1403919-010-R-Rev0-2000, Dated December 17, 2014

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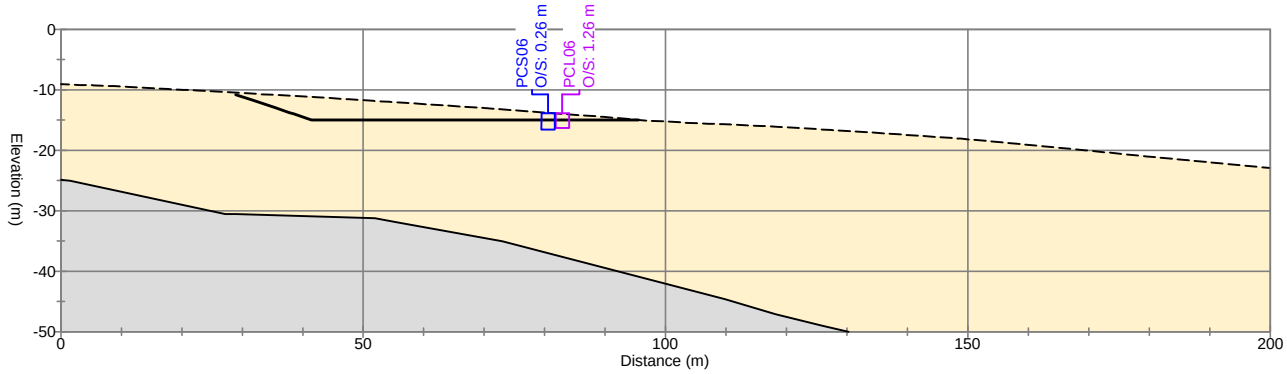
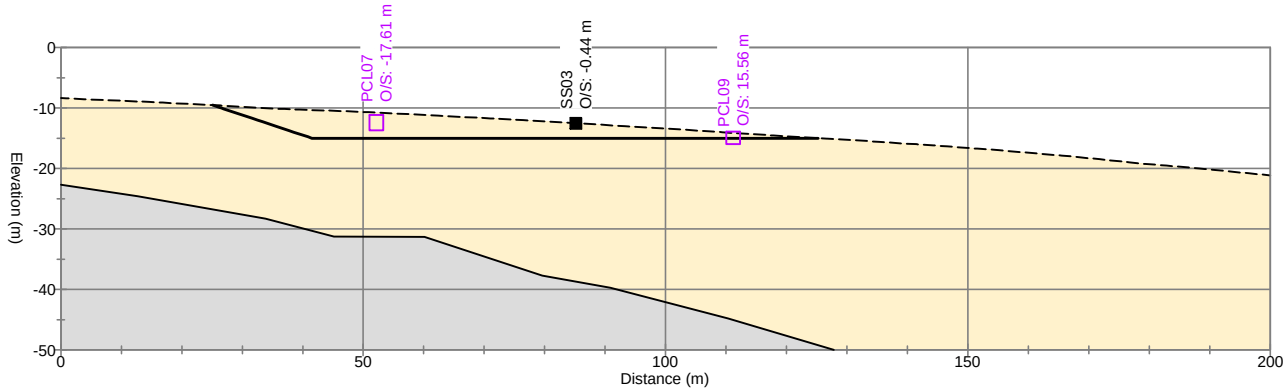
MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

VERTICAL PROFILE OF DREDGE FOOTPRINT IN BERTH 1 (NORTH) ALIGNMENTS 5-6

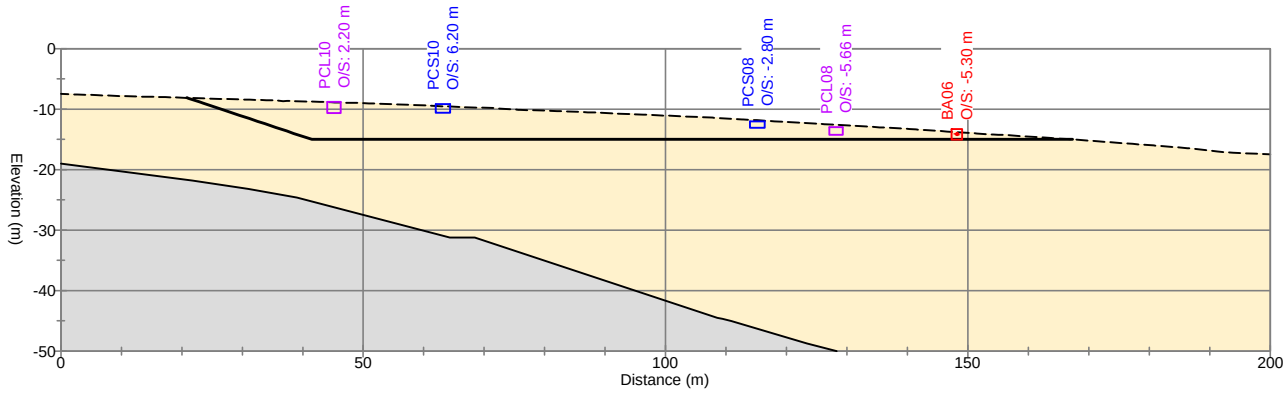
Projection: UTM Zone 9 Datum: NAD 83	Fig. ID: 123220054 Date: Mar 22, 2016	Drawn By: GH Checked By: PW	FIGURE NO: 17



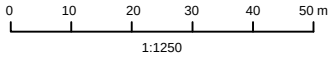
Profile View of Alignment 7



Profile View of Alignment 8



Profile View of Alignment 9



- Seabed
- Dredge Surface
- Estimated Sediment
- Estimated Bedrock
- Individual Surface Sample or Mean Core Concentration >CCME ISQG (0.85 pg/g)
- O/S Offset from Alignment

Sediment Core

- Vibracore Sample Depth - Primary Core Large (PCL; 0.5 m) Interval Core Sample Site
- Vibracore Sample Depth - Primary Core Small (PCS; 0.2 m) Interval Core Sample Site (Analysis Includes Dioxins and Furans)

Surface Sediment Samples

- Surface Grab
- Surface Grab (Analysis Includes Dioxins and Furans)
- CCME Canadian Coucil of Ministers of the Environment
- ISQG Interim Sediment Quality Guideline
- TEQ Toxic Equivalency

***Note:** Units in pg/g TEQ

Data Sources: Sub-bottom Profiling Data from Golder Hydrographic and Marine Geophysical Surveys for Nexen Aurora LNG Report, Reference Number: 1403919-010-R-Rev0-2000, Dated December 17, 2014

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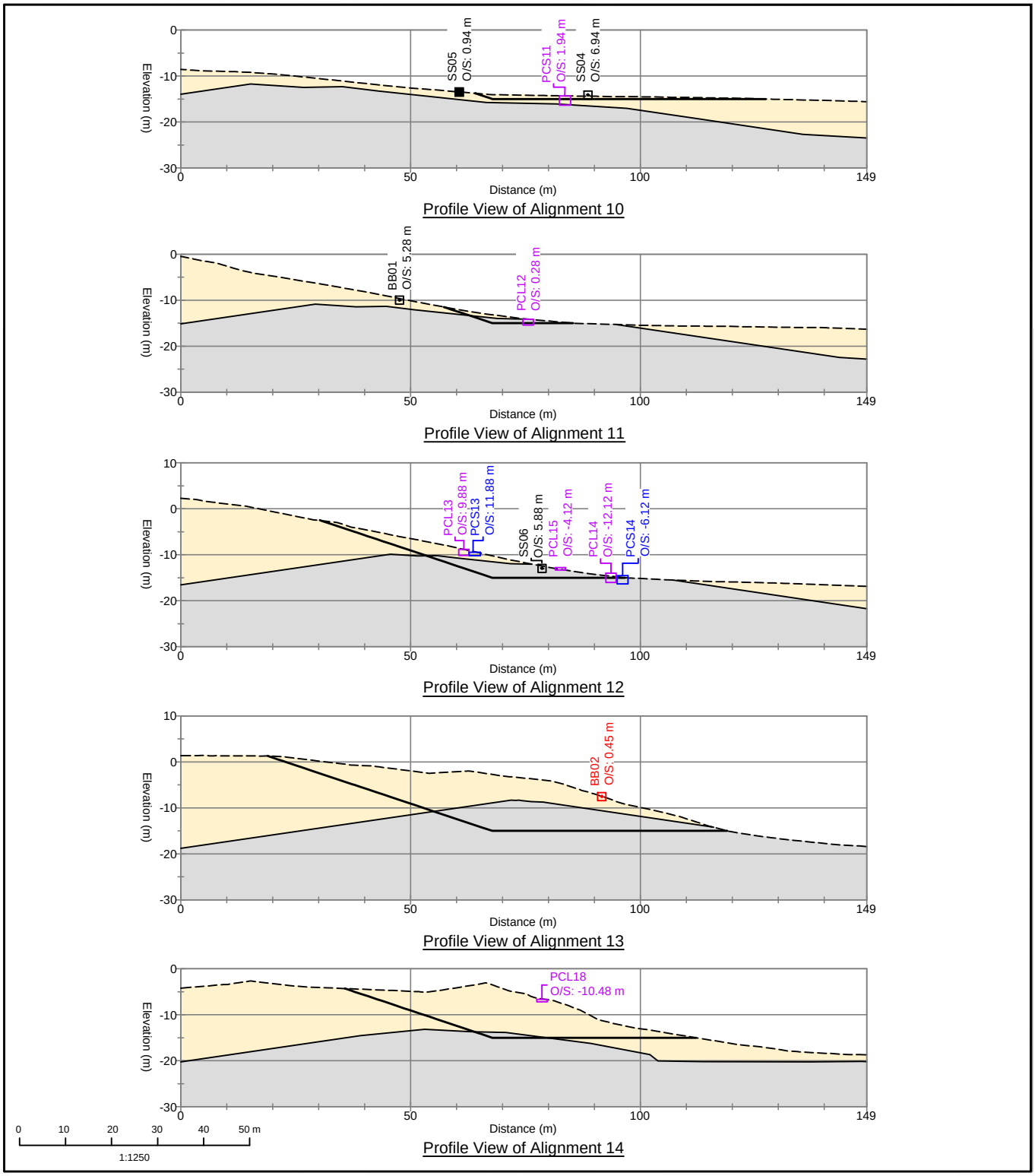
MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

VERTICAL PROFILE OF DREDGE FOOTPRINT IN BERTH 1 (SOUTH) ALIGNMENTS 7-9

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID: 123220054 Date: Mar 22, 2016	Drawn By: GH Checked By: PW	FIGURE NO: 18



Seabed
Dredge Surface
Estimated Sediment
Estimated Bedrock
Individual Surface Sample or Mean Core Concentration >CCME ISQG (0.85 pg/g)
O/S Offset from Alignment

Sediment Core

Vibracore Sample Depth - Primary Core Large (PCL; 0.5 m) Interval Core Sample Site
Vibracore Sample Depth - Primary Core Small (PCS; 0.2 m) Interval Core Sample Site (Analysis Includes Dioxins and Furans)

Surface Sediment Samples

Surface Grab
Surface Grab (Analysis Includes Dioxins and Furans)

CCME Canadian Coucil of Ministers of the Environment
ISQG Interim Sediment Quality Guideline
TEQ Toxic Equivalency

***Note:** Units in pg/g TEQ

Data Sources: Sub-bottom Profiling Data from Golder Hydrographic and Marine Geophysical Surveys for Nexen Aurora LNG Report, Reference Number: 1403919-010-R-Rev0-2000, Dated December 17, 2014

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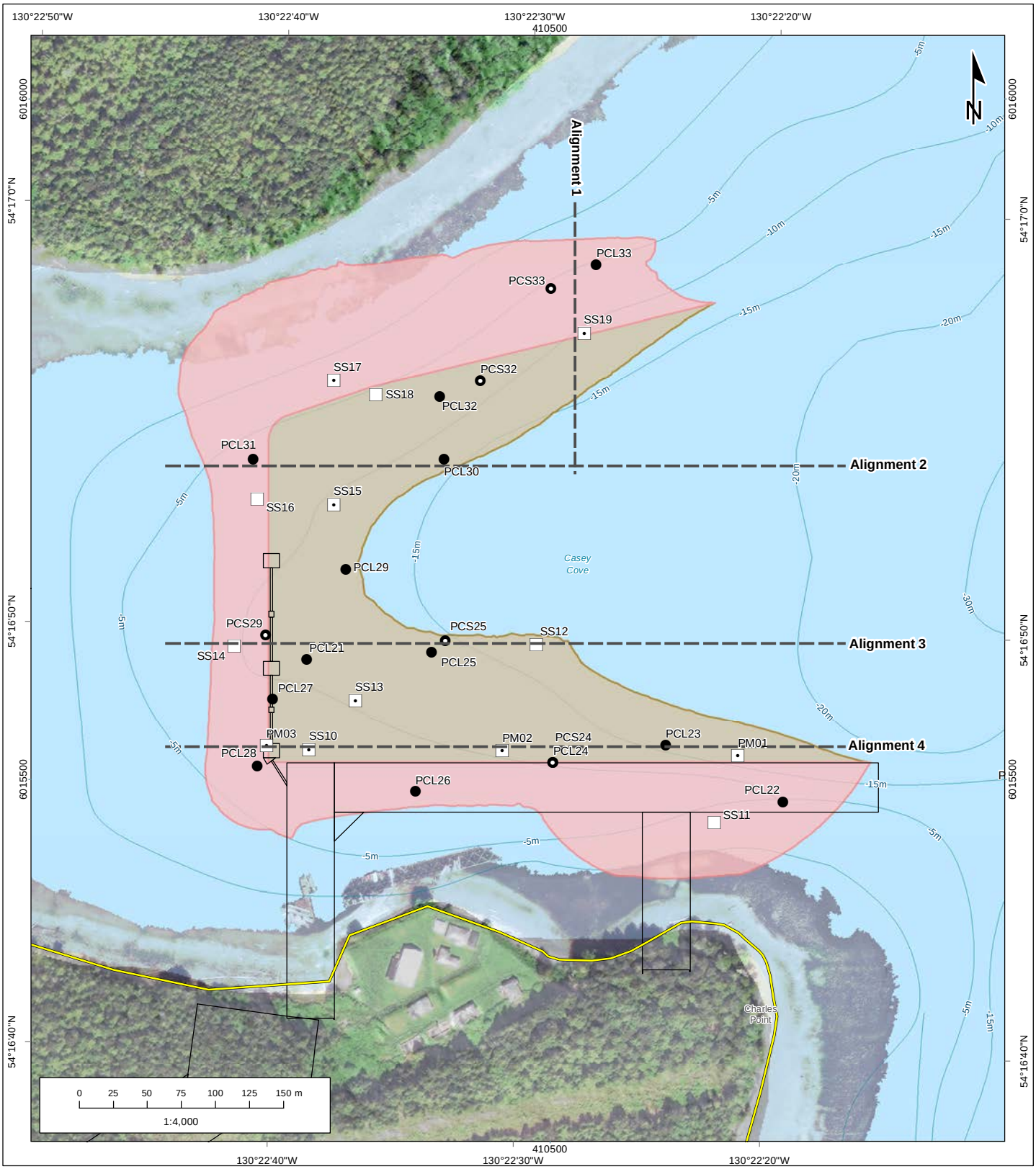
MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

VERTICAL PROFILE OF DREDGE FOOTPRINT IN BERTH 2 ALIGNMENTS 10-14

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID: 123220054 Date: Mar 22, 2016	Drawn By: GH Checked By: PW	FIGURE NO:	19



Bathymetric Contour
Waterbody
Project Component
Terrestrial Portion of the Project Development Area

Proposed Dredge Area Footprint
Dredge Basin (-15m CD)
Dredge Side Slope (5H:1V)
Profile Alignment

Sediment Cores
Vibracore - Primary Core Large (PCL; 0.5m) Interval Core Sample Site
Vibracore - Primary Core Small (PCS; 0.2m) Interval Core Sample Site (Analysis Includes Dioxins and Furans)

Surface Sediment Samples
Surface Grab (Analysis Includes Dioxins and Furans)
Surface Grab

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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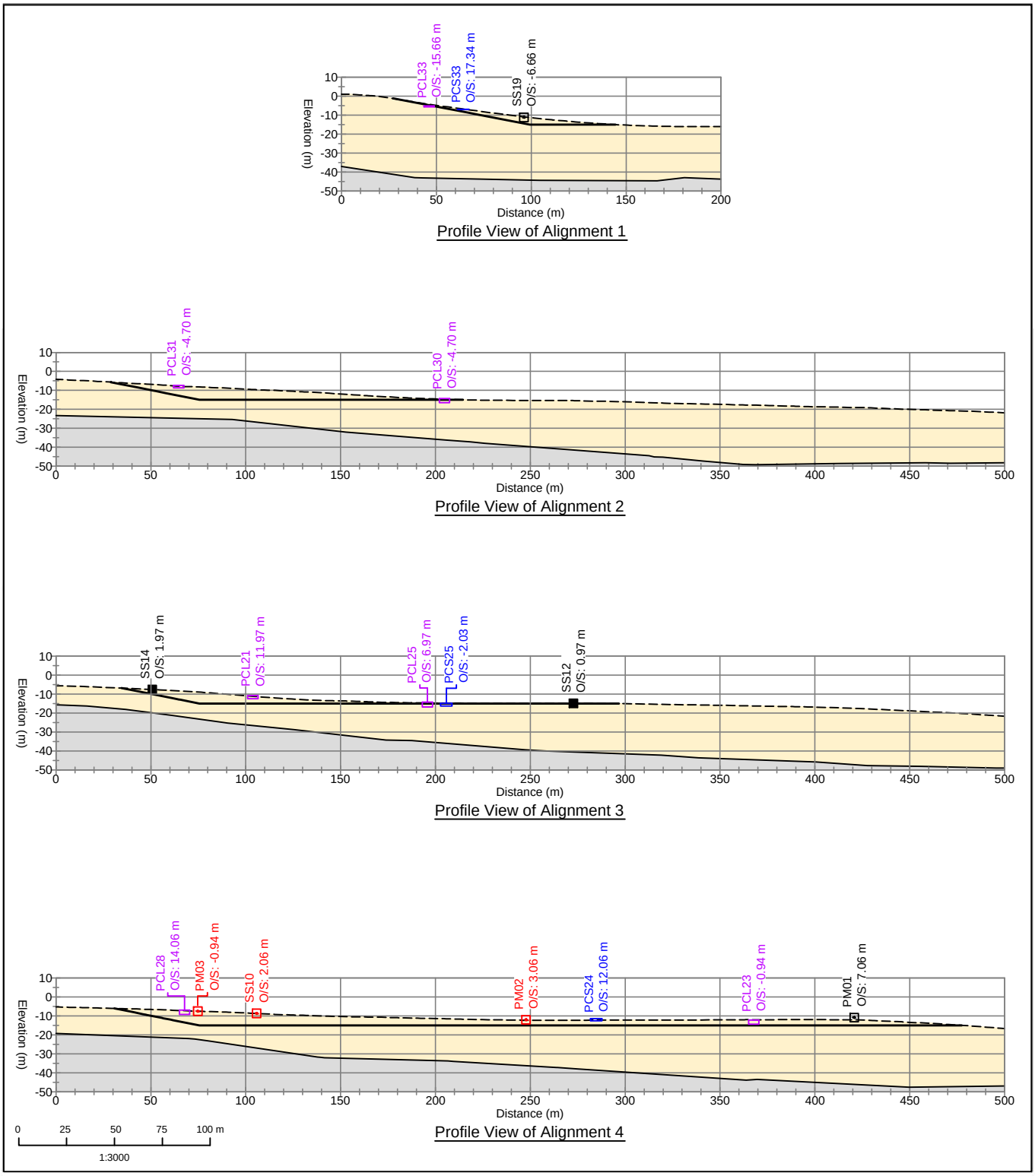
MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

MATERIALS OFFLOADING FACILITY AREA ALIGNMENT LOCATIONS FOR VERTICAL PROFILES

Projection:UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 12, 2016	Drawn By: RC Checked By: SD	FIGURE NO: **20**



- Seabed
- Dredge Surface
- Estimated Sediment
- Estimated Bedrock
- Individual Surface Sample or Mean Core Concentration >CCME ISQG (0.85 pg/g)
- O/S Offset from Alignment

Sediment Core

- Vibracore Sample Depth - Primary Core Large (PCL; 0.5 m) Interval Core Sample Site
- Vibracore Sample Depth - Primary Core Small (PCS; 0.2 m) Interval Core Sample Site (Analysis Includes Dioxins and Furans)

Surface Sediment Samples

- Surface Grab
- Surface Grab (Analysis Includes Dioxins and Furans)

- CCME Canadian Coucil of Ministers of the Environment
- ISQG Interim Sediment Quality Guideline
- TEQ Toxic Equivalency

***Note:** Units in pg/g TEQ

Data Sources: Sub-bottom Profiling Data from Golder Hydrographic and Marine Geophysical Surveys for Nexen Aurora LNG Report, Reference Number: 1403919-010-R-Rev0-2000, Dated December 17, 2014

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MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

VERTICAL PROFILE OF DREDGE FOOTPRINT IN MOF ALIGNMENTS 1-4

Projection:UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Mar 22, 2016	Drawn By: GH Checked By: PW	FIGURE NO:	**21**

APPENDIX 1

ERIS Database Search Summary

1.1 ERIS Database Search Summary

Table 1-1 is a summary of all 43 databases searched, including a description of the database, dates active, jurisdiction (provincial, federal, or private), and the number of search results generated as of November 6, 2015 for the specified boundary. Many databases returned zero results for the specified boundary area. Although searching all databases available to ERIS in British Columbia illustrates due diligence on behalf of Nexen in comprehensively identifying sources of contaminants that may affect the load site material quality, those databases that returned zero results are not discussed further. A total of 148 search results were obtained from the following 15 databases:

- Authorization Management System, formerly WASTE (10 results)
- Compliance and Enforcement Summary (1 result)
- Wastewater Discharge Inventory (12 results)
- ERIS Historical Searches (6 results)
- Contaminated Sites on Federal Land (41 results)
- Commercial Fisheries (19 results)
- Waste Generators Summary (3 results)
- Minerals Deposits Database (1 result)
- National Environmental Emergencies System, NEES (4 results)
- National PCB Inventory (5 results)
- National Pollutant Release Inventory (24 results)
- Inventory of PCB Storage Sites (5 results)
- Scott's Manufacturing Directory (1 result)
- Site Registry (11 results)
- Waste Disposal Site Inventory (5 results)

The boundary was set to encompass the jurisdiction of the Prince Rupert Port Authority. While this boundary encompasses shoreline and marine areas, upland sources of waste that may have been discharged to the marine environment may not have been captured by the search.

Table 1-2 displays only those databases that generated search results, with additional information on each unique generator and nature of the source, if available, and associated potential contaminants of concern that could influence load site sediment quality.

Table 1-1 Overall ERIS Database Search Summary, Within the Boundary of the Prince Rupert Port Authority, Conducted November 6, 2015

	Database	Description	Publication Dates	Provincial, Federal, or Private?	Number of Search Results
1	Authorization Management System (formerly WASTE)	AMS is the Ministry of Environment's waste permit administration system. It maintains data related to the administration of permits issued under the Environmental Management Act and registrations under various regulations where the regulation requires a discharger to register. It will include information such as companies or individuals permitted to discharge waste; type of business and locations at which waste disposal is permitted; the types, amounts and frequency of waste products that are permitted to be discharged at given locations; issue date and more. This was previously referred to as the "WASTE" database.	1957-Jan 2012	Provincial	10
2	Assessment Report Indexing System	Within British Columbia, the "Mineral Tenure Act Regulation", requires that all results of mineral exploration and development programs be submitted to the British Columbia Ministry of Employment and Investment, where they are then maintained and housed by the Geological Survey Branch. The assessment reports provided by the Geological Survey Branch contain summary information for reports approved to November 1998; on geology, geophysics, geochemistry, drilling, prospecting and physical work.	1947-2014	Provincial	0
3	Automobile Wrecking & Supplies	This database provides an inventory of all known locations that are involved in the scrap metal, automobile wrecking/recycling, and automobile parts & supplies industry. Information is provided on the company name, location and business type.	2001-Jul 2014	Private	0
4	BC Oil and Gas Wells	The BC Oil and Gas Wells database was collected from the BC Oil and Gas Commission and is a comprehensive database that includes information regarding well number, well name, operator name, location, depth, status, as well as drill date and type. Please note that this database will not be updated, information on wells drilled after January 2006 can be found in the Oil and Gas Wells (OGW) database under the 'Private Source Database' section.	1918-Jan 2006*	Provincial	0
5	Chemical Register	This database includes a listing of locations of facilities within the Province or Territory that either manufacture and/or distributes chemicals.	1999-Jul 2014	Private	0
6	Coal Tar Sites	This one-time study is an inventory of all known and historical coal tar sites, identifying sites that produced coal tar and other related tars during the mid 1800's to the mid 1900's.	1992*	Provincial	0
7	Compliance and Enforcement Summary	This database summarizes orders, tickets and convictions issued by the Ministry of the Environment under applicable ministry and federal legislation. Orders are issued when action is required to prevent or stop actual or potential impact to the environment. Tickets apply to all tickets paid, deemed guilty by non-payment or expiry, or contested in court and found guilty by a judge. Convictions apply to all court convictions of ministry legislation as well as federal legislation where the ministry has taken action. This reporting summary began in January 2006, replacing Non-Compliance Reports by the former Ministry of Water, Land & Air Protection. See the Non-Compliance Reports (NCPL) database below for more information. This database is part of a larger COORS (Conservation Officer On-Line Reporting System) database controlled by the Ministry of Environment in BC.	1990-Sep 2014	Provincial	1
8	Wastewater Discharge Inventory	This inventory contains information regarding direct dischargers of toxic pollutants for the following operations: Industrial; Commercial; Agricultural; Mining; Municipal; Urban; Aquaculture; and Pulp & Paper, operating under provincial permits. Please note that this program was discontinued and therefore the database will not be updated.	1957-1995*	Provincial	12
9	Environmental Effects Monitoring	The Environmental Effects Monitoring program assesses the effects of effluent from industrial or other sources on fish, fish habitat and human usage of fisheries resources. Since 1992, pulp and paper mills have been required to conduct EEM studies under the Pulp and Paper Effluent Regulations. This database provides information on the mill name, geographical location and sub-lethal toxicity data.	1992-2007*	Federal	0
10	ERIS Historical Searches	ERIS has compiled a database of all environmental risk reports completed since March 1999. Available fields for this database include: site location, date of report, type of report, and search radius. As per all other databases, the ERIS database can be referenced on both the map and "Statistical Profile" page.	1999-Aug 2014	Private	6
11	Environmental Issues Inventory System	The Environmental Issues Inventory System was developed through the implementation of the Environmental Issues and Remediation Plan. This plan was established to determine the location and severity of contaminated sites on inhabited First Nation reserves, and where necessary, to remediate those that posed a risk to health and safety; and to prevent future environmental problems. The EIIS provides information on the reserve under investigation, inventory number, name of site, environmental issue, site action (Remediation, Site Assessment), and date investigation completed.	1992-2001*	Federal	0
12	Federal Convictions	Environment Canada maintains a database referred to as the "Environmental Registry" that details prosecutions under the Canadian Environmental Protection Act (CEPA) and the Fisheries Act (FA). Information is provided on the company name, location, charge date, offence and penalty.	1988-Jun 2007*	Federal	0
13	Contaminated Sites on Federal Land	The Federal Contaminated Sites Inventory includes information on all known federal contaminated sites under the custodianship of departments, agencies and consolidated Crown corporations as well as those that are being or have been investigated to determine whether they have contamination arising from past use that could pose a risk to human health or the environment. The inventory also includes non-federal contaminated sites for which the Government of Canada has accepted some or all financial responsibility. It does not include sites where contamination has been caused by, and which are under the control of, enterprise Crown corporations, private individuals, firms or other levels of government.	June 2000-Jul 2015	Federal	41
14	Commercial Fisheries	The Fisheries, Aquaculture & Commercial Fisheries Branch of the Ministry of Water, Land & Air Protection maintains a database of fish processing plant approvals, licenses and activities. Each year, licenses need to be renewed.	1993-2012	Provincial	19
15	Fisheries & Oceans Fuel Tanks	Fisheries & Oceans Canada maintains an inventory of all aboveground & underground fuel storage tanks located on Fisheries & Oceans property or controlled by DFO. Our inventory provides information on the site name, location, tank owner, tank operator, facility type, storage tank location, tank contents & capacity, and date of tank installation.	1964-Sept 2003	Federal	0

Table 1-1 Overall ERIS Database Search Summary, Within the Boundary of the Prince Rupert Port Authority, Conducted November 6, 2015

	Database	Description	Publication Dates	Provincial, Federal, or Private?	Number of Search Results
16	Waste Generators Summary	Within British Columbia, the Special Waste Regulation defines a waste generator as any site, equipment and/or operation involved in the production, collection, handling and/or storage of regulated wastes. A generator of regulated waste is required to register the waste generation site and each waste produced, collected, handled, or stored at the site. This database contains the registration number (BCG#), company name and address of registered generators; including the types of hazardous wastes generated and the form of treatment used in the handling of the waste. Some of "Waste Generators Summary" addresses may represent mailing addresses rather than waste/hazardous sites. This information is a summary of all years from June 1993 to March 2006. Please note that a British Columbia Generator number (BCG#) are not unique to a company. This database is part of a larger SWIS (Special Waste Information System) database controlled by the Ministry of Environment in BC. Waste Generators Summary data are historic and no longer being updated.	1993-2010*	Provincial	3
17	Indian & Northern Affairs Fuel Tanks	The Department of Indian & Northern Affairs Canada (INAC) maintains an inventory of all aboveground & underground fuel storage tanks located on both federal and crown land. Our inventory provides information on the reserve name, location, facility type, site/facility name, tank type, material & ID number, tank contents & capacity, and date of tank installation.	1950-Aug 2003*	Federal	0
18	Lumber Mills	This database provides information regarding the general location and estimated annual output capacity of major timber processing facilities within the province of British Columbia.	1997-2011	Provincial	0
19	Canadian Mine Locations	This information is collected from the Canadian & American Mines Handbook. The Mines database is a national database that provides over 290 listings on mines (listed as public companies) dealing primarily with precious metals and hard rocks. Listed are mines that are currently in operation, closed, suspended, or are still being developed (advanced projects). Their locations are provided as geographic coordinates (x, y and/or longitude, latitude). As of 2002, data pertaining to Canadian smelters and refineries has been appended to this database.	1998-2009*	Private	0
20	Minerals Deposits Database	The Ministry of Energy and Mines maintains a database of more than 12,000 metallic mineral, industrial mineral and coal deposits and occurrences within British Columbia. Information within our report pertains to primary name, elevation, mining division, commodities, and status. Please note that as of January 27, 1999, information included within this database was divided into 2 categories: released and unreleased areas. Records for unreleased areas may contain incomplete, unedited, and/or inaccurate data.	1852-May 2014	Provincial	1
21	National Analysis of Trends in Emergencies System (NATES)	In 1974 Environment Canada established the National Analysis of Trends in Emergencies System (NATES) database, for the voluntary reporting of significant spill incidents. The data was to be used to assist in directing the work of the emergencies program. NATES ran from 1974 to 1994. Extensive information is available within this database including company names, place where the spill occurred, date of spill, cause, reason and source of spill, damage incurred, and amount, concentration, and volume of materials released.	1974-1994*	Federal	0
22	Non-Compliance Reports	From 1990 to March 2001 the Ministry of Water, Land & Air Protection maintained a reporting system that identified any reported concern that pertained to compliance with authorized waste management permits or plans, approvals, orders, operational certificates and regulations, or any other activity under the Waste Management Act. This reporting system was discontinued in April of 2001; therefore there will be no updates to this database. However, beginning in January 2006 the Ministry of the Environment began publishing Compliance and Enforcement Summaries. See the Compliance and Enforcement Summary (CPL) database above for more information.	1990-Mar 2001*	Provincial	0
23	National Defence & Canadian Forces Fuel Tanks	The Department of National Defence and the Canadian Forces maintains an inventory of all aboveground & underground fuel storage tanks located on DND lands. Our inventory provides information on the base name, location, tank type & capacity, tank contents, tank class, date of tank installation, date tank last used, and status of tank as of May 2001. This database will no longer be updated due to the new National Security protocols which have prohibited any release of this database.	Up to May 2001*	Federal	0
24	National Defence & Canadian Forces Spills	The Department of National Defence and the Canadian Forces maintains an inventory of spills to land and water. All spill sites have been classified under the "Transportation of Dangerous Goods Act - 1992". Our inventory provides information on the facility name, location, spill ID #, spill date, type of spill, as well as the quantity of substance spilled & recovered.	Mar 1999-Aug 2010	Federal	0
25	National Defence & Canadian Forces Waste Disposal Sites	The Department of National Defence and the Canadian Forces maintains an inventory of waste disposal sites located on DND lands. Where available, our inventory provides information on the base name, location, type of waste received, area of site, depth of site, year site opened/closed and status.	2001-Apr 2007*	Federal	0
26	National Energy Board Wells	The NEBW database contains information on onshore & offshore oil and gas wells that are outside provincial jurisdiction(s) and are thereby regulated by the National Energy Board. Data is provided regarding the operator, well name, well ID No./UWI, status, classification, well depth, spud and release date.	1920-Feb 2003*	Federal	0
27	National Environmental Emergencies System (NEES)	In 2000, the Emergencies program implemented NEES, a reporting system for spills of hazardous substances. For the most part, this system only captured data from the Atlantic Provinces, some from Quebec and Ontario and a portion from British Columbia. Data for Alberta, Saskatchewan, Manitoba and the Territories was not captured. However, NEES is also a repository for all previous Environment Canada spill datasets. NEES is composed of the historic datasets ' or Trends ' which dates from approximately 1974 to present. NEES Trends is a compilation of historic databases, which were merged and includes data from NATES (National Analysis of Trends in Emergencies System), ARTS (Atlantic Regional Trends System), and NEES. In 2001, the Emergencies Program determined that variations in reporting regimes and requirements between federal and provincial agencies made national spill reporting and trend analysis difficult to achieve. As a consequence, the department has focused efforts on capturing data on spills of substances which fall under its legislative authority only (CEPA and FA). As such, the NEES database will be decommissioned in December 2004.	1974-2003*	Federal	4

Table 1-1 Overall ERIS Database Search Summary, Within the Boundary of the Prince Rupert Port Authority, Conducted November 6, 2015

	Database	Description	Publication Dates	Provincial, Federal, or Private?	Number of Search Results
28	National PCB Inventory	Environment Canada's National PCB inventory includes information on in-use PCB containing equipment in Canada including federal, provincial and private facilities. All federal out-of-service PCB containing equipment and all PCB waste owned by the federal government or by federally regulated industries such as airlines, railway companies, broadcasting companies, telephone and telecommunications companies, pipeline companies, etc. are also listed. Although it is not Environment Canada's mandate to collect data on non-federal PCB waste, the National PCB inventory includes some information on provincial and private PCB waste and storage sites. Some addresses provided may be Head Office addresses and are not necessarily the location of where the waste is being used or stored.	1988-2008*	Federal	5
29	National Pollutant Release Inventory	Environment Canada has defined the National Pollutant Release Inventory ("NPRI") as a federal government initiative designed to collect comprehensive national data regarding releases to air, water, or land, and waste transfers for recycling for more than 300 listed substances.	1993-2013	Federal	24
30	Oil and Gas Wells	The Nickle's Energy Group (publisher of the Daily Oil Bulletin) collects information on drilling activity including operator and well statistics. The well information database includes name, location, class, status and depth. The main Nickle's database is updated on a daily basis, however, this database is updated on a monthly basis. More information is available at www.nickles.com.	1988-Sep 2015	Private	0
31	Canadian Pulp and Paper	This information is part of the Pulp and Paper Canada Directory. The Directory provides a comprehensive listing of the locations of pulp and paper mills and the products that they produce.	1999, 2002, 2004, 2005, 2009	Private	0
32	Inventory of PCB Storage Sites	The Ministry of Water, Land & Air Protection maintains a database of all active Polychlorinated Biphenyls (PCB) waste storage sites within the Special Waste Information System. Please note that there is no requirement to maintain an accurate listing of all inactive PCB waste storage equipment and/or disposal sites. The records within this database provide information regarding site name, location, an inventory of stored wastes and quantities, and status date (when site first active/inactive). Previous to May 1993, data was collected from a different source and is only available for 1989. Inventory of PCB Storage Sites data are historic and no longer being updated.	1989, May 1993-2010*	Provincial	5
33	Parks Canada Fuel Storage Tanks	Canadian Heritage maintains an inventory of all known fuel storage tanks operated by Parks Canada, in both National Parks and at National Historic Sites. The database details information on site name, location, tank install/removal date, capacity, fuel type, facility type, tank design and owner/operator.	1920-Jan 2005*	Federal	0
34	Pesticide Register	This is a database of individuals who apply for a service or vendor license for the use of registered pesticides. A service license is denoted by an "S" in the license number, likewise, a vendor license by a "V" in the license number.	1989-Jun 2013	Provincial	0
35	Private Aggregate Inventory	Within British Columbia, aggregate pits are designated as mines; and as such, the Ministry of Energy and Mines is responsible for their planning, management and regulation, including permitting, health, safety and reclamation. Owners or operators of all private aggregate pits must file Notices of Work as part of the permitting and reclamation process. In 1994, the Geological Survey Branch initiated the Aggregate Program, in order to establish an inventory of natural and crushed aggregate pits. Information about each pit in the database file includes its location, NTS map sheet number, Notice of Work file number and status (active/inactive) and the type of landform hosting the pit. This database was a onetime inventory and will not be updated.	1975-1996*	Provincial	0
36	Public Aggregate Inventory	Information about public aggregate pits in British Columbia is collected and managed by the Ministry of Transportation and Highways. Data has been gathered on more than 2000 pits, in respect to pit name, type and geographical location.	1960-2001*	Provincial	0
37	Waste Receivers Summary	The Special Waste Regulation defines the disposal of regulated waste through an operating waste management system or a waste disposal site operated or used pursuant to the terms and conditions of a Certificate of Approval or a Provisional Certificate of Approval. A waste receiving location is any site or facility to which waste is transferred through a waste carrier. A receiver of regulated waste is required to register the waste receiving facility. This database represents registered receivers of regulated wastes, identified by registration number, company name and address. Some of "Waste Receivers Summary" addresses may represent mailing addresses rather than waste/hazardous sites. This database is part of a larger SWIS (Special Waste Information System) database controlled by the Ministry of Environment in BC. Waste Receivers Summary data are historic and no longer being updated.	1992-2010*	Provincial	0
38	Retail Fuel Storage Tanks	This database includes an inventory of retail fuel outlet locations (including marinas) that have on their property gasoline, oil, waste oil, natural gas and / or propane storage tanks.	1999-Jul 2014	Private	0
39	Scott's Manufacturing Directory	Scott's Directories is a data bank containing information on over 200,000 manufacturers across Canada. Even though Scott's listings are voluntary, it is the most comprehensive database of Canadian manufacturers available. Information concerning a company's address, plant size, and main products are included in this database.	1992-Mar 2011*	Private	1
40	Site Registry	This information is collected from the Ministry of Environment's Site Registry. It is not a registry of contaminated sites, although some sites on the registry are contaminated. Most sites have already been investigated and require minor remediation, or have already been cleaned up to government requirements. The Registry also stores environmentally relevant historic information about sites including: names of participants, legal and administrative notations, references to pertinent documents submitted to the ministry, associations with other sites, and much more.	1985-Sep 2015, Detail Rpt Up to Oct 2012	Provincial	11

Table 1-1 Overall ERIS Database Search Summary, Within the Boundary of the Prince Rupert Port Authority, Conducted November 6, 2015

	Database	Description	Publication Dates	Provincial, Federal, or Private?	Number of Search Results
41	Transport Canada Fuel Storage Tanks	List of fuel storage tanks currently or previously owned or operated by Transport Canada. This inventory also includes tanks on The Pickering Lands, which refers to 7,530 hectares (18,600 acres) of land in Pickering, Markham, and Uxbridge owned by the Government of Canada since 1972; properties on this land has been leased by the government since 1975, and falls under the Site Management Policy of Transport Canada, but is administered by Public Works and Government Services Canada. This inventory provides information on the site name, location, tank age, capacity and fuel type.	1970-Mar 2007	Federal	0
42	Waste Disposal Site Inventory	This inventory pertains to active, regulated waste disposal sites within the province of British Columbia. Registered companies may hold a permit or certificate for release of the following waste types: Effluent, Refuse, Air and Special Waste Storage. Information on Waste Disposal Sites after 1998 is contained within the Authorizations (AUTH) database.	1980-1998*	Provincial	5
43	Water Well Information System	This database was collected from the Groundwater Information Center of the Ministry of Water, Land & Air Protection and contains over 90,000 records. Comprehensive information is available for each well including: well location (address/site area), latitude/longitude, legal description (section, lot, plan, district lot, range, township), BCGS Mapsheet No., depth of well, construction dates, well status and lithology. The accuracy of well locations is also provided, as well as the reference source for obtaining geographic coordinates.	1880-Sep 2015	Provincial	0
Total					**148**

NOTE:

* denotes the database is no longer being updated (see individual database description for more detail)

Table 1-2 ERIS Database Search Results, Within the Boundary of the Prince Rupert Port Authority, Conducted November 6, 2015

	Database	Description	Publication Dates	Provincial, Federal, or Private?	# of Search Results	Further Details			
						Site ID	Company, Location	Discharge, Effluent or Spill Type, if available (date of record in brackets)	Potential Contaminants of Concern
1	Authorization Management System (formerly WASTE)	AMS is the Ministry of Environment's waste permit administration system. It maintains data related to the administration of permits issued under the Environmental Management Act and registrations under various regulations where the regulation requires a discharger to register. It will include information such as companies or individuals permitted to discharge waste; type of business and locations at which waste disposal is permitted; the types, amounts and frequency of waste products that are permitted to be discharged at given locations; issue date and more. This was previously referred to as the "WASTE" database.	1957-Jan 2012	Provincial	10	1.1	Skeena Cellulose Inc., Watson Island, Port Edward	Unknown discharge types - Special Waste Storage Permit (1989), Air Permit (1978), Refuse Permit (1974), Hazardous Waste Regulation Permit (1988-2012)	N/A - no release noted
						1.2	J.S. McMillan Fisheries Limited, Prince Rupert	Unknown (1998)	N/A - no release noted
						1.3	Suncor Energy Inc., Prince Rupert	Unknown discharge types - Petroleum storage and Distribution Permit (2011), Facilities Storm Water Regulation Permit (2011)	N/A - no release noted
						1.4	Petro-Canada, Prince Rupert	Unknown discharge types - Effluent permit (2008)	N/A - no release noted
2	Compliance and Enforcement Summary	This database summarizes orders, tickets and convictions issued by the Ministry of the Environment under applicable ministry and federal legislation. Orders are issued when action is required to prevent or stop actual or potential impact to the environment. Tickets apply to all tickets paid, deemed guilty by non-payment or expiry, or contested in court and found guilty by a judge. Convictions apply to all court convictions of ministry legislation as well as federal legislation where the ministry has taken action. This reporting summary began in January 2006, replacing Non-Compliance Reports by the former Ministry of Water, Land & Air Protection. See the Non-Compliance Reports (NCPL) database below for more information. This database is part of a larger COORS (Conservation Officer On-Line Reporting System) database controlled by the Ministry of Environment in BC.	1990-Sep 2014	Provincial	1	2.1	Skeena Cellulose Inc., Watson Island, Port Edward	Unknown discharge type - Contravention of Special Waste Regulations (2000)	N/A - unknown contaminants
3	Wastewater Discharge Inventory	This inventory contains information regarding direct dischargers of toxic pollutants for the following operations: Industrial; Commercial; Agricultural; Mining; Municipal; Urban; Aquaculture; and Pulp & Paper, operating under provincial permits. Please note that this program was discontinued and therefore the database will not be updated.	1957-1995*	Provincial	12	3.1	Prince Rupert Grain Ltd., Ridley Island, Prince Rupert	Grain terminal industrial effluent, marine domestic effluent permit (1989)	N/A - unknown contaminants
						3.2	Aero Trading Co. Ltd., Porpoise Harbour, Port Edward	Fish processing industrial effluent, marine industrial effluent permit (1989)	N/A - unknown contaminants
						3.3	Tenerife Packing Company Ltd., Porpoise Harbour, Port Edward	Fish processing industrial effluent, marine industrial effluent permit (1994)	N/A - unknown contaminants
						3.4	Skeena Cellulose Inc., Watson Island, Port Edward	Pulp and paper mill industrial effluent, marine industrial effluent permit (1975)	N/A - unknown contaminants
						3.5	British Columbia Packers Limited, Port Edward	Fish processing industrial effluent, marine domestic effluent permit (1973)	N/A - unknown contaminants
						3.6	National Harbour Board, Prince Rupert	Marine station urban sewage effluent, marine domestic effluent permit (1976)	N/A - unknown contaminants
						3.7	J.S. McMillan Fisheries Limited, Prince Rupert	Fish processing industrial effluent, marine-cooling water effluent permit (1978)	N/A - unknown contaminants
						3.8	City of Prince Rupert, Prince Rupert	Municipal water treatment plant sewage effluent, marine domestic effluent permit (1980)	N/A - unknown contaminants
						3.9	Prince Rupert Forest Products, Prince Rupert	Pulp and paper mill unknown effluent, marine industrial effluent permit (1974)	N/A - unknown contaminants

Table 1-2 ERIS Database Search Results, Within the Boundary of the Prince Rupert Port Authority, Conducted November 6, 2015

	Database	Description	Publication Dates	Provincial, Federal, or Private?	# of Search Results	Further Details			
						Site ID	Company, Location	Discharge, Effluent or Spill Type, if available (date of record in brackets)	Potential Contaminants of Concern
4	ERIS Historical Searches	ERIS has compiled a database of all environmental risk reports completed since March 1999. Available fields for this database include: site location, date of report, type of report, and search radius. As per all other databases, the ERIS database can be referenced on both the map and "Statistical Profile" page.	1999-Aug 2014	Private	6	4.1	Unknown - Ridley Island	unknown (report date 2012)	N/A - no release noted
						4.2	Unknown - Port Edward	unknown (report date 2014)	N/A - no release noted
						4.3	Unknown - Prince Rupert	unknown (report date 2007 & 2008)	N/A - no release noted
						4.4	Fairview Terminal - Prince Rupert	unknown (report date 2002)	N/A - no release noted
5	Contaminated Sites on Federal Land	The Federal Contaminated Sites Inventory includes information on all known federal contaminated sites under the custodianship of departments, agencies and consolidated Crown corporations as well as those that are being or have been investigated to determine whether they have contamination arising from past use that could pose a risk to human health or the environment. The inventory also includes non-federal contaminated sites for which the Government of Canada has accepted some or all financial responsibility. It does not include sites where contamination has been caused by, and which are under the control of, enterprise Crown corporations, private individuals, firms or other levels of government.	June 2000-Jul 2015	Federal	41	5.1	East Kinahan Island, BC	DFO Historical Review: no known contamination	N/A - no release noted
						5.2	Prince Rupert, Barrett Rock, BC	DFO Historical Review: no known contamination	N/A - no release noted
						5.3	Frederick Point, BC	DFO Historical Review: no known contamination	N/A - no release noted
						5.4	Digby Island Transmitter, BC	DFO Historical Review: no known contamination	N/A - no release noted
						5.5	Greentop Islet, BC	DFO Historical Review: no known contamination	N/A - no release noted
						5.6	Porpoise Harbour, BC	DFO Historical Review: no known contamination	N/A - no release noted
						5.7	Unnamed site, Skeena Queen Charlotte, BC	Possible lead-based paint on 3 x 6 m building causing soil contamination	metals, metalloids, organometallics (Pb)
						5.8		Unused materials, debris, and refuse causing soil and groundwater contamination	polycyclic aromatic hydrocarbons (PAHs), metals, metalloids, organometallics, petroleum hydrocarbons (PHCs)
						5.9	Port Edward, Porpoise Channel Entrance, BC	DFO Historical Review: no known contamination	N/A - no release noted
						5.10	Prince Rupert, Casey Point, BC	DFO Historical Review: no known contamination	N/A - no release noted
						5.11	Port Edward, BC	DFO Historical Review: potential for contaminated sediment	PAHs, PHCs, metals, metalloids, organometallics
						5.12	Port Edward, Porpoise Channel West, BC	DFO Historical Review: no known contamination	N/A - no release noted
						5.13	Port Edward, Porpoise Harbour Entrance Range Front, BC	Possible lead-based paint on shore light causing surface water, soil, and air contamination; submerged off-shore batteries causing surface water and sediment contamination	metals, metalloids, organometallics
						5.14	Port Edward, Porpoise Harbour Entrance Ranger Rear, BC	DFO Initial Testing Program: no known contamination	N/A - no release noted
						5.15	Port Edward, Porpoise Channel East, BC	DFO Historical Review: no known contamination	N/A - no release noted
						5.16	Parizeau Point, BC	DFO Historical Review: no known contamination	N/A - no release noted
						5.17	Dodge Cove, BC	DFO Historical Review: no known contamination	N/A - no release noted

Table 1-2 ERIS Database Search Results, Within the Boundary of the Prince Rupert Port Authority, Conducted November 6, 2015

	Database	Description	Publication Dates	Provincial, Federal, or Private?	# of Search Results	Further Details			
						Site ID	Company, Location	Discharge, Effluent or Spill Type, if available (date of record in brackets)	Potential Contaminants of Concern
5						5.18	Prince Rupert, Canadian Coast Guard Search and Rescue Station, Fairview, BC	Submerged off-shore batteries causing surface water and sediment contamination; Possible creosote compounds from timber batteries causing sediment and surface water contamination	metals, metalloids, organometallics, petroleum hydrocarbons (PHCs), polycyclic aromatic hydrocarbons (PAHs)
						5.19	Prince Rupert, Fairview Bay, BC	DFO Historical Review: no known contamination	N/A - no release noted
						5.20	Prince Rupert, Oldfield Breakwater, BC	DFO Historical Review: no known contamination	N/A - no release noted
						5.21	McIntosh Rock, BC	Identified as a suspect site; no known contamination	N/A - no release noted
						5.22	Grindstone Point, BC	DFO Historical Review: no known contamination	N/A - no release noted
						5.23	Shkgeaum Bay Range Front & Rear, BC	DFO Historical Review: no known contamination	N/A - no release noted
						5.24	Venn Passage, BC	DFO Historical Review: no known contamination	N/A - no release noted
						5.25	Duvernet Point, BC	DFO Historical Review: no known contamination	N/A - no release noted
						5.26	Metlakatla, BC	Aboriginal Affairs and Northern Development Canada Initial Testing Program: possible surface soil contamination	N/A - no release noted
						5.27	Dundas Point, BC	DFO Historical Review: no known contamination	N/A - no release noted
						5.28	Prince Rupert, Cow Bay, BC	DFO Historical Review: possible sediment contamination	metals, metalloids, organometallics, petroleum hydrocarbons (PHCs), polycyclic aromatic hydrocarbons (PAHs)
						5.29	Prince Rupert, Rushbrook Tidemark, BC	Identified as a suspect site; no contaminated sites	N/A - no release noted
						5.30	Prince Rupert, Rushbrook, BC	DFO Historical Review: possible sediment contamination	metals, metalloids, organometallics, petroleum hydrocarbons (PHCs), polycyclic aromatic hydrocarbons (PAHs)
						5.31	Prince Rupert, Rushbrook Entrance North and South, BC	Identified as a suspect site; no known contamination	N/A - no release noted
						5.32	Seal Cove, BC	DFO Historical Review: no known contamination	N/A - no release noted
6	Commercial Fisheries	The Fisheries, Aquaculture & Commercial Fisheries Branch of the Ministry of Water, Land & Air Protection maintains a database of fish processing plant approvals, licenses and activities. Each year, licenses need to be renewed.	1993-2012	Provincial	19	6.1	Odin Seafood Ltd./J.S. McMillan Fisheries Ltd./Prince Rupert Seafood Products, Prince Rupert	Large commercial fisheries licences for storage, fin fish, herring roe, invertebrates, and salmon processing (1993, 1994, 2002-2012)	N/A - no release noted
						6.2	Ocean Fisheries Ltd. Royal Plant, Prince Rupert	Large commercial fisheries licence for storage, fin fish, herring roe, and salmon processing (1993 & 2010)	N/A - no release noted

Table 1-2 ERIS Database Search Results, Within the Boundary of the Prince Rupert Port Authority, Conducted November 6, 2015

	Database	Description	Publication Dates	Provincial, Federal, or Private?	# of Search Results	Further Details			
						Site ID	Company, Location	Discharge, Effluent or Spill Type, if available (date of record in brackets)	Potential Contaminants of Concern
7	Waste Generators Summary	Within British Columbia, the Special Waste Regulation defines a waste generator as any site, equipment and/or operation involved in the production, collection, handling and/or storage of regulated wastes. A generator of regulated waste is required to register the waste generation site and each waste produced, collected, handled, or stored at the site. This database contains the registration number (BCG#), company name and address of registered generators; including the types of hazardous wastes generated and the form of treatment used in the handling of the waste. Some of "Waste Generators Summary" addresses may represent mailing addresses rather than waste/hazardous sites. This information is a summary of all years from June 1993 to March 2006. Please note that a British Columbia Generator number (BCG#) are not unique to a company. This database is part of a larger SWIS (Special Waste Information System) database controlled by the Ministry of Environment in BC. Waste Generators Summary data are historic and no longer being updated.	1993-2010*	Provincial	3	7.1	Skeena Cellulose Inc., Watson Island, Port Edward	Waste generated: PCB-contaminated clothes, waste asbestos, waste oil, waste PCB-contaminated transformer oil, waste type 3 (1995)	N/A - no release noted
						7.2	Northwest Fuels, Prince Rupert	Waste generated: leachable toxic waste (waste oil filters) cartridges, waste oil, waste oily solids (2011)	N/A - no release noted
8	Minerals Deposits Database	The Ministry of Energy and Mines maintains a database of more than 12,000 metallic mineral, industrial mineral and coal deposits and occurrences within British Columbia. Information within our report pertains to primary name, elevation, mining division, commodities, and status. Please note that as of January 27, 1999, information included within this database was divided into 2 categories: released and unreleased areas. Records for unreleased areas may contain incomplete, unedited, and/or inaccurate data.	1852-May 2014	Provincial	1	8.1	Frederick Point, Digby Island	Limestone, marble, building stone deposits - no known discharge	N/A - no release noted
9	National Environmental Emergencies System (NEES)	In 2000, the Emergencies program implemented NEES, a reporting system for spills of hazardous substances. For the most part, this system only captured data from the Atlantic Provinces, some from Quebec and Ontario and a portion from British Columbia. Data for Alberta, Saskatchewan, Manitoba and the Territories was not captured. However, NEES is also a repository for all previous Environment Canada spill datasets. NEES is composed of the historic datasets ' or Trends ' which dates from approximately 1974 to present. NEES Trends is a compilation of historic databases, which were merged and includes data from NATES (National Analysis of Trends in Emergencies System), ARTS (Atlantic Regional Trends System), and NEES. In 2001, the Emergencies Program determined that variations in reporting regimes and requirements between federal and provincial agencies made national spill reporting and trend analysis difficult to achieve. As a consequence, the department has focused efforts on capturing data on spills of substances which fall under its legislative authority only (CEPA and FA). As such, the NEES database will be decommissioned in December 2004.	1974-2003*	Federal	4	9.1	Skeena Cellulose Inc., Watson Island, Port Edward	20 gallon sulphuric acid leak (2000)	N/A
						9.2		Effluent leak (2001)	N/A - unknown contaminants
						9.3		Unknown discharge (2000)	N/A - unknown contaminants
						9.4	Petro Canada, Prince Rupert	3134 L kerosene leak at marine terminal (2001)	hydrocarbons

Table 1-2 ERIS Database Search Results, Within the Boundary of the Prince Rupert Port Authority, Conducted November 6, 2015

	Database	Description	Publication Dates	Provincial, Federal, or Private?	# of Search Results	Further Details			
						Site ID	Company, Location	Discharge, Effluent or Spill Type, if available (date of record in brackets)	Potential Contaminants of Concern
10	National PCB Inventory	Environment Canada's National PCB inventory includes information on in-use PCB containing equipment in Canada including federal, provincial and private facilities. All federal out-of-service PCB containing equipment and all PCB waste owned by the federal government or by federally regulated industries such as airlines, railway companies, broadcasting companies, telephone and telecommunications companies, pipeline companies, etc. are also listed. Although it is not Environment Canada's mandate to collect data on non-federal PCB waste, the National PCB inventory includes some information on provincial and private PCB waste and storage sites. Some addresses provided may be Head Office addresses and are not necessarily the location of where the waste is being used or stored.	1988-2008*	Federal	5	10.1	Skeena Cellulose Inc., Watson Island, Port Edward	No recorded details	N/A - no release noted
						10.2	Prince Rupert Fisherman's Co-op, Prince Rupert	5 L Askarel destroyed/treated, 5 L Askarel in use, 46 L Askarel stored for disposal (1994)	N/A - no release noted
						10.3	J.S. McMillan Fisheries Limited, Prince Rupert	15 L Askarel in use, 5 L Askarel stored for disposal (1993)	N/A - no release noted
						10.4	Ocean Fisheries Ltd., Prince Rupert	12 L Askarel destroyed/treated, 12 L Askarel in use (1994); capacitor storage	N/A - no release noted
11	National Pollutant Release Inventory	Environment Canada has defined the National Pollutant Release Inventory ("NPRI") as a federal government initiative designed to collect comprehensive national data regarding releases to air, water, or land, and waste transfers for recycling for more than 300 listed substances.	1993-2013	Federal	24	11.1	Ridley Terminals Inc., Ridley Island, Prince Rupert	1.5 tonnes PM10 particulate matter released into air (2008, 2009, 2010)	N/A
						11.2		Unknown discharge (2011, 2012)	N/A - unknown contaminants
						11.3	Prince Rupert Grain Ltd., Ridley Island, Prince Rupert	12.47 tonnes total particulate matter, 5.375 tonnes PM10 particulate matter, 11.297 tonnes PM2.5 particulate matter released into air (2002)	N/A
						11.4		18.916 tonnes total particulate matter, 12.925 tonnes PM10 particulate matter, 5.992 tonnes PM2.5 particulate matter released into air (2003)	N/A
11						11.5		51.604 tonnes total particulate matter, 34.964 tonnes PM10 particulate matter, 16.64 tonnes PM2.5 particulate matter released into air (2004)	N/A
						11.6		47.782 tonnes total particulate matter, 31.463 tonnes PM10 particulate matter, 16.319 tonnes PM2.5 particulate matter released into air (2005)	N/A
						11.7		77.567 tonnes total particulate matter, 51.303 tonnes PM10 particulate matter, 26.264 tonnes PM2.5 particulate matter released into air (2006)	N/A
						11.8		82.866 tonnes total particulate matter, 53.866 tonnes PM10 particulate matter, 29.001 tonnes PM2.5 particulate matter released into air (2007)	N/A
						11.9		59.35 tonnes total particulate matter, 38.212 tonnes PM10 particulate matter, 21.138 tonnes PM2.5 particulate matter released into air (2008)	N/A
						11.10		82.268 tonnes total particulate matter, 53.543 tonnes PM10 particulate matter, 28.725 tonnes PM2.5 particulate matter released into air (2009)	N/A
						11.11		59.973 tonnes total particulate matter, 39.339 tonnes PM10 particulate matter, 20.634 tonnes PM2.5 particulate matter released into air (2010)	N/A

Table 1-2 ERIS Database Search Results, Within the Boundary of the Prince Rupert Port Authority, Conducted November 6, 2015

	Database	Description	Publication Dates	Provincial, Federal, or Private?	# of Search Results	Further Details			
						Site ID	Company, Location	Discharge, Effluent or Spill Type, if available (date of record in brackets)	Potential Contaminants of Concern
11						11.12		68.575 tonnes total particulate matter, 44.207 tonnes PM10 particulate matter, 24.369 tonnes PM2.5 particulate matter released into air (2011)	N/A
						11.13	Skeena Cellulose Inc., Watson Island, Port Edward	857.69 tonnes unknown release to air and 5.38 tonnes unknown release to water (1993)	N/A - unknown contaminants
						11.14		616.6 tonnes unknown release to air (1994)	N/A
						11.15		616.6 tonnes unknown release to air (1995)	N/A
						11.16		616.6 tonnes unknown release to air (1996)	N/A
						11.17		412.6 tonnes unknown release to air (1997)	N/A
						11.18		173.4 tonnes unknown release to air (1998)	N/A
						11.19		192.53 tonnes unknown release to air (1999)	N/A
						11.20		Approximately 897 tonnes unknown release to air and 267 tonnes unknown release to water (2000)	N/A - unknown contaminants
						11.21		Approximately 267 tonnes unknown release to air and 82 tonnes unknown release to water (2001)	N/A - unknown contaminants
12	Inventory of PCB Storage Sites	The Ministry of Water, Land & Air Protection maintains a database of all active Polychlorinated Biphenyls (PCB) waste storage sites within the Special Waste Information System. Please note that there is no requirement to maintain an accurate listing of all inactive PCB waste storage equipment and/or disposal sites. The records within this database provide information regarding site name, location, an inventory of stored wastes and quantities, and status date (when site first active/inactive). Previous to May 1993, data was collected from a different source and is only available for 1989. Inventory of PCB Storage Sites data are historic and no longer being updated.	1989, May 1993-2010*	Provincial	5	12.1	Skeena Cellulose Inc., Watson Island, Port Edward	12000 L stored waste PCB contaminated transformer oil, 100 Kg stored PCB contaminated clothes and tools, 2000 Kg PCB waste (1995)	N/A - no release noted
						12.2	Prince Rupert Fisherman's Co-op, Prince Rupert	250 L stored PCB liquid waste (1999)	N/A - no release noted
						12.3	J.S. McMillan Fisheries Limited, Prince Rupert	Capacitor storage	N/A - no release noted
						12.4	Ocean Fisheries Ltd., Prince Rupert	Capacitor storage	N/A - no release noted
13	Scott's Manufacturing Directory	Scott's Directories is a data bank containing information on over 200,000 manufacturers across Canada. Even though Scott's listings are voluntary, it is the most comprehensive database of Canadian manufacturers available. Information concerning a company's address, plant size, and main products are included in this database.	1992-Mar 2011*	Private	1	13.1	Ocean Fisheries Limited, Prince Rupert	Seafood Product Preparation and Packaging	N/A - no release noted
14	Site Registry	This information is collected from the Ministry of Environment's Site Registry. It is not a registry of contaminated sites, although some sites on the registry are contaminated. Most sites have already been investigated and require minor remediation, or have already been cleaned up to government requirements. The Registry also stores environmentally relevant historic information about sites including: names of participants, legal and administrative notations, references to pertinent documents submitted to the ministry, associations with other sites, and much more.	1985-Sep 2015, Detail Rpt Up to Oct 2012	Provincial	11	14.1	Skeena Cellulose Inc., Watson Island, Port Edward	Site with complex contamination - unknown discharge types	N/A - no release noted
						14.2	Fairview Terminal, Prince Rupert	Unranked site - unknown discharge types	N/A - no release noted
						14.3	Prince Rupert Airport, Digby Island	Unranked site - unknown discharge types	N/A - no release noted
						14.4	Marcan Construction Inc., Prince Rupert	Site with simple contamination - unknown discharge types	N/A - no release noted
						14.5	CN Railyard Foreshore Contamination, Prince Rupert	Site with complex contamination - unknown discharge types	N/A - no release noted

Table 1-2 ERIS Database Search Results, Within the Boundary of the Prince Rupert Port Authority, Conducted November 6, 2015

	Database	Description	Publication Dates	Provincial, Federal, or Private?	# of Search Results	Further Details			
						Site ID	Company, Location	Discharge, Effluent or Spill Type, if available (date of record in brackets)	Potential Contaminants of Concern
14						14.6	Former CN Railway Station, Prince Rupert	Unranked site - unknown discharge types	N/A - no release noted
						14.7	Parcel A, Cow Bay Road, Prince Rupert	Site with simple contamination - unknown discharge types	N/A - no release noted
						14.8	Cruise Ship Terminal, Prince Rupert	Site with complex contamination - unknown discharge types	N/A - no release noted
						14.9	Atlin Terminal, Prince Rupert	Unranked site - unknown discharge types	N/A - no release noted
						14.10	Chevron Bulk Plant, Prince Rupert	Site with simple contamination - unknown discharge types	N/A - no release noted
						14.11	Petro-Canada Marine Terminal, Prince Rupert	Unranked site - unknown discharge types	N/A - no release noted
15	Waste Disposal Site Inventory	This inventory pertains to active, regulated waste disposal sites within the province of British Columbia. Registered companies may hold a permit or certificate for release of the following waste types: Effluent, Refuse, Air and Special Waste Storage. Information on Waste Disposal Sites after 1998 is contained within the Authorizations (AUTH) database.	1980-1998*	Provincial	5	15.1	Skeena Cellulose Inc., Watson Island, Port Edward	Air, refuse, effluent, special waste storage permits - unknown discharge types	N/A - no release noted
Total					**148**				

NOTE:

* denotes the database is no longer being updated (see individual database description for more detail)

APPENDIX 2

Environment and Climate Change Canada
Disposal at Sea Guidance Documents

Environment Canada

Interim Guidance for the Assessment of risks from Dioxins and Furans in sediments proposed for Disposal at Sea in Pacific and Yukon Region

April 2014

Purpose and Background

Dioxins and furans are a group of Persistent Organic Pollutants (POPs) which are considered highly toxic, posing a risk to human health and the environment. Dioxins and furans are by-products of industrial processes such as petroleum refining, pulp and paper mills (pre-1999), coal fired power plants and uncontrolled waste incineration, all of which have a historical presence on the coast of British Columbia. This guidance was developed out of a need to provide recommendations for projects on the north coast of BC where dioxins and furans have been identified as a chemical of concern. The disposal at sea permit assessment process requires that material proposed for disposal is characterized to assess the potential for adverse effects on human health and the marine environment as per Schedule 6 of the *Canadian Environmental Protection Act* (CEPA) and the *Disposal at Sea regulations*. Regulated Action Levels and policy-based guidance values have been developed to ensure that material that has the potential to cause acute or chronic effects on human health or sensitive marine organisms is not permitted for open water disposal. The *Disposal at Sea regulations* do not identify Action Levels (i.e., concentration thresholds) for the management of dioxins and furans. As such, this guidance sets out a Lower Action Level for dioxins and furans below which adverse effects from open water disposal would not be expected. The best available science and international approaches to the management of dioxins and furans in sediment were reviewed and integrated into this approach.

Development and Rationale

London Protocol (2009) guidance on the development of Interim Action Levels for dredged material describes a method where contaminant benchmarks of similar intent and construct from multiple jurisdictions are considered. In this interim guidance, a similar "consensus approach" was used, taking the mean of comparable[1] benchmarks from other relevant jurisdictions to generate lower action levels[2].

Environment Canada's management approach for dioxins and furans includes:

(1) A Lower Action Level (LAL), using a consensus value derived from Canadian provincial, US and Finnish guidelines; and
(2) An overall management objective (OMO) based on the Canadian Council of Ministers of the Environment (CCME) interim sediment quality guidelines (ISQG) for dioxins and furans.

[1] Comparable is defined here as benchmarks used as 'screening level' values, below which no adverse effects from open water disposal are expected.

[2] Apitz, S. E., & Agius, S. (2013) Anatomy of a decision: Potential regulatory outcomes from changes to chemistry protocols in the Canadian Disposal at Sea Program. *Marine pollution bulletin*, *69*(1), 76-90.

To support Environment Canada's management approach, sampling procedures from Washington State's Dredged Material Management Program (DMMP) *Dredged material evaluation and disposal procedures (users' manual)* 2013 and the DMMP *Puget Sound Sediment PCB and Dioxin Survey 2008* were adapted for use in this guidance because they contain comprehensive guidance specific to the sampling and analysis of dioxins in a region ecologically similar to coastal British Columbia.

Methodology

Environment Canada's interim guidance consists of three parts: 1) outlining a sampling approach for sediment where dioxins and furans have been identified as a concern, 2) outlining the methodology for calculating dioxin and furan concentrations for individual dredging horizons/layers as well as for an entire dredging project, and 3) the Action Levels of dioxins and furans.

Part 1 – Sampling Approach

The purpose of the sampling approach described below is to delineate the distribution of dioxins and furans horizontally and vertically across the dredge site, and provide a better understanding of the volume of material potentially affected by dioxins and furans. *It does not address the sampling requirements to fully characterize the physical and chemical characteristics of a dredge site for consideration for disposal at sea.*

Initially, core samples should be collected evenly across the proposed dredge area. Environment Canada can provide guidance on the minimum number of core samples required. Each core sample that is collected for dioxin/furan analysis is to be divided into 20 cm segments within the strata of concern. The depth of the strata of concern will be dependent on site-specific conditions such as:

- Proximity of the dredge site to the source(s) of contamination
- Duration and magnitude of exposure
- Time since last exposure
- Tides, currents, and depositional nature of sediment at the dredge site
- Physical properties of the sediment at the dredge site

Environment Canada recommends collecting samples in 20cm segments to a depth beyond which dioxins and furans are expected to be found, to ensure that the strata of concern is adequately delineated.

"Sampling units" are defined as follows:

- Within the strata of concern, each 20 cm vertical layer is considered one "sampling unit", assuming each of these 20cm fractions has similar physical properties. Each vertical sampling unit will generally encompass the entire area to be dredged, unless there are reasons to further stratify the area horizontally (an example of further stratification based on physical properties is shown in Figure 1).

- Below the strata of concern, a “sampling unit” can be delineated based on homogenous chemical and physical properties.

Each vertical sampling unit will generally encompass the entire area to be dredged, unless there are reasons to further stratify the area horizontally (an example of further stratification based on physical properties is shown in Figure 1).

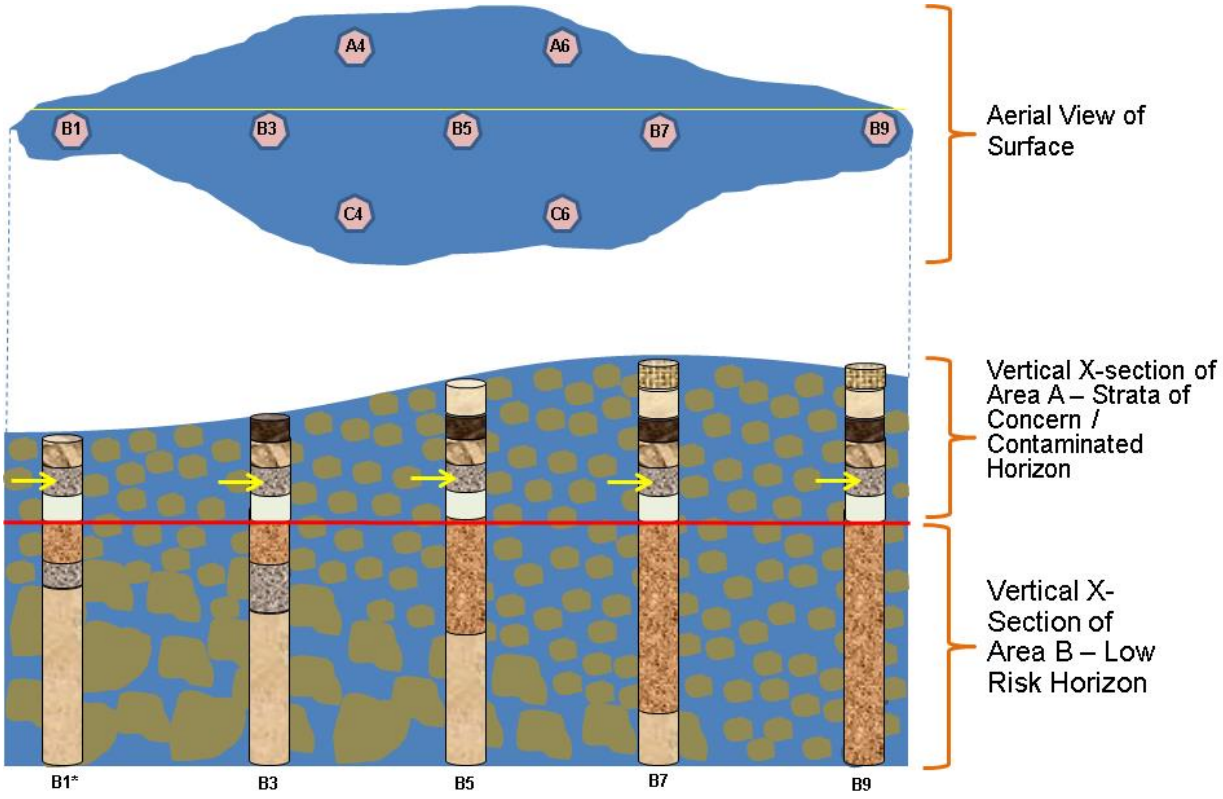


Figure 1: Aerial and cross-sectional views of a sampling area. Not to scale, and not intended to represent a recommended sampling design. The red line is the maximum extent of contamination vertically. The yellow arrows show 20 cm fractions from Area A that are physically and chemically homogeneous; these fractions should be treated as one ‘sampling unit’. Within area B, the low-risk horizon, cores are vertically divided by their physical properties. If chemically homogenous, each set of coloured fractions within Area B should be regarded as one ‘sampling unit’, such that there are three Area B sampling units in the diagram.

Sampling plans should be developed in consultation with Environment Canada as it is critical that applicants have Environment Canada endorsement in advance of sampling. Applicants may be required to collect additional samples or supporting information if they do not have agreement from Environment Canada on the sampling approach, or fail to follow Environment Canada sampling advice. It is the responsibility of the proponent to document and demonstrate that the physical and chemical characteristics of the entire volume to be dredged are well understood.

Part 2 – Methodology for Calculating Dioxin and Furan Concentrations

The concentrations of dioxins and furans are reported in Toxic Equivalency Quotients (TEQs) which need to be calculated using Toxicity Equivalency Factors (TEFs). Raw laboratory analytical results for each dioxin/furan congener should be reported to Environment Canada. The World Health Organization (WHO) 1998 TEF values for fish, as shown in Table 1, should be used to calculate TEQ values from raw congener data, as fish are the primary receptor of dioxins and furans in marine sediment.

Table 1: Toxic equivalency factors (TEFs) for selected PCDD and PCDF congeners Structure[3]

Structure	TEFs for Fish
PCDDs	
2,3,7,8-TCDD	1
1,2,3,7,8-PCDD	1
1,2,3,4,7,8-HCDD	0.5
1,2,3,6,7,8-HCDD	0.01
1,2,3,7,8,9-HCDD	0.01
1,2,3,4,6,7,8-HCDD	0.001
OCDD	0.0001
PCDFs	
2,3,7,8-TCDF	0.05
1,2,3,7,8-PCDF	0.05
2,3,4,7,8-PCDF	0.5
1,2,3,4,7,8-HCDF	0.1
1,2,3,6,7,8-HCDD	0.1
1,2,3,7,8,9-HCDF	0.1
2,3,4,6,7,8-HCDF	0.1
1,2,3,4,6,7,8-HCDF	0.01
1,2,3,4,7,8,9-HCDF	0.01
OCDF	0.0001

[3] 1998 WHO TEF values (van den Berg et al. 1998)

Part 3- Action Levels for Dioxins/Furans

Lower action levels in the disposal at sea context are intended to be the level below which risks to the marine environment and human health are expected to be negligible.

For dioxins and furans in sediments proposed for disposal at sea, Environment Canada endorses the following management approach:

Sampling units with 95% upper confidence level dioxin and furan concentrations of 9 ng/kg TEQ[4] or less will be allowed for open-water disposal at non-dispersive sites as long as the volume-weighted average concentration of dioxins in material from the entire dredging project does not exceed the Overall Management Objective (OMO) of 0.85 ng/kg TEQ[5].

Sampling units with dioxin and furan concentrations less than 9 ng/kg TEQ that can be disposed of in open water may nonetheless be subject to additional management requirements (e.g., order of disposal, use of dredging equipment that minimizes dispersion, monitoring during loading and/or disposal, etc.).

[4] 9 ng/kg is the consensus value derived from Canadian provincial, US and Finnish guidelines

[5] 0.85 ng/kg is the CCME Interim Sediment Quality Guideline value below which adverse biological effects are expected to occur rarely.

APPENDIX: Calculating UCL and Volume Weighted Average

Calculating the 95% Upper Confidence Limit (UCL)

The 95% UCL dioxin and furan concentrations in a sampling unit should be calculated using simple bootstrapping unless there is previous knowledge of the underlying distribution of data.

If the 95% UCL for a sampling unit exceeds 9 ng/kg TEQ, then the dredged material from that sampling unit will not be considered for open water disposal. If this material is removed and managed via another disposal option then the remaining area can be re-sampled and may be further considered for disposal at sea.

Calculating the volume weighted average

Only sampling units with a 95% UCL dioxin and furan concentrations of 9 ng/kg TEQ or less can be included in the volume-weighted average calculation. For the purposes of this calculation, the percent of the total project volume represented by each chemical analytical result is determined. Each chemical analytical result should then be multiplied by the corresponding percent of the volume to 'weight' it. The mean of the weighted chemical data should then be calculated, and compared to the 0.85 ng/kg TEQ dioxin/ furan benchmark. Only projects, or the portions of projects with a volume weighted average of 0.85 or less ng/kg TEQ will be eligible for open water disposal.

Disposal at Sea
Minimum Sample Analytical Requirements

The table below outlines minimum analytical requirements for projects with no contaminant history. Prior to sampling, Environment Canada should be consulted to determine the need for additional site-specific analytical requirements.

Metals	**Digestion Method**	**Analytical Method**[1]	**Target Detection Limit (mg/kg dry weight)**	**Reference Criterion (mg/kg dry weight)**
Cadmium	EPA 3050B	EPA 6020A	0.20	0.60[2]
Mercury	EPA 3050B	EPA 7471	0.05	0.75[2]
Arsenic	EPA 3050B	EPA 6020A	1.00	7.24[3]
Chromium	EPA 3050B	EPA 6020A	1.00	52.3[3]
Copper	EPA 3050B	EPA 6020A	1.00	18.7[3]
Lead	EPA 3050B	EPA 6020A	0.50	30.2[3]
Zinc	EPA 3050B	EPA 6020A	1.00	124[3]
Organics		**Analytical Method**[1]	**Target Detection Limit (mg/kg dry weight)**	**Reference Criterion (mg/kg dry weight)**
Total polychlorinated biphenyls (PCB)		EPA 8080	0.04	0.10[2]
Total polycyclic aromatic hydrocarbons (PAH), [Σ16]		EPA 8270C	0.05	2.50[2]
Acenapthene		EPA 8270C	0.05	
Napthalene		EPA 8270C	0.05	
Acenapthylene		EPA 8270C	0.05	
Anthracene		EPA 8270C	0.05	
Phenanthrene		EPA 8270C	0.05	
Flourene		EPA 8270C	0.05	
Fluoranthene		EPA 8270C	0.05	
Benz[a]anthracene		EPA 8270C	0.05	
Benzo[a]pyrene		EPA 8270C	0.05	
Benzo[b]fluoranthene		EPA 8270C	0.05	
Benzo[k]fluoranthene		EPA 8270C	0.05	
Chrysene		EPA 8270C	0.05	
Benzo[ghi]perylene		EPA 8270C	0.05	
Dibenz[a,h]anthracene		EPA 8270C	0.05	
Indeno[1,2,-cd]pyrene		EPA 8270C	0.05	
Pyrene		EPA 8270C	0.05	
Physical Parameters		**Analytical Method**[1]	**Measurement**	
Total Organic Carbon		EPA 9060A	0.01% dry weight	
Percent Moisture		ASTM D2794-00	1%	
Percent Grain Size Distribution		ASTM D422-63	Sieve and pipette analysis	
Gravel		ASTM D422-63	16 mm – 2 mm	
Sand		ASTM D422-63	2 mm - 0.0625 mm	
Silt		ASTM D422-63	0.0625 mm - 0.0039 mm	
Clay		ASTM D422-63	< 0.0039 mm	

Notes:

[1] An equivalent method certified under the Canadian Association for Laboratory Accreditation that can achieve the specified target detection limit is acceptable.

[2] *Canadian Environmental Protection Act, 1999, Disposal at Sea Regulation*s.

[3] Canadian Council of Ministers of the Environment. 1999. Canadian Environmental Quality Guidelines, Sediment Quality Guidelines for the Protection of Aquatic Life (Marine).

Disposal at Sea
Minimum Sample Collection Requirements[1]

In situ volume (m^3) of material for disposal			# Samples[2]
1	to	10 000	6 samples
10 001	to	17 000	7 samples
17 001	to	23 000	8 samples
23 001	to	30 000	9 samples
30 001	to	37 000	10 samples
37 001	to	43 000	11 samples
43 001	to	50 000	12 samples
50 001	to	58 000	13 samples
58 001	to	67 000	14 samples
67 001	to	75 000	15 samples
75 001	to	83 000	16 samples
83 001	to	92 000	17 samples
92 001	to	100 000	18 samples
100 001	to	141 000	19 samples
141 001	to	182 000	20 samples
182 001	to	223 000	21 samples
223 001	to	264 000	22 samples
264 001	to	305 000	23 samples
305 001	to	346 000	24 samples
346 001	to	386 000	25 samples
386 001	to	427 000	26 samples
427 001	to	468 000	27 samples
468 001	to	509 000	28 samples
509 001	to	591 000	29 samples
591 001	to	632 000	30 samples
632 001	to	673 000	31 samples
673 001	to	714 000	32 samples
714 001	to	755 000	33 samples
755 001	to	795 000	34 samples
795 001	to	836 000	35 samples
836 001	to	877 000	36 samples
877 001	to	918 000	37 samples
918 001	to	959 000	38 samples
959 001	to	1 000 000	39 samples

[1] Adapted from Environment Canada, 1994 – EPS1/RM/29. Note: The table above refers to the minimum number of surface samples required for routine projects located in areas with no known contaminant history. Environment Canada should be contacted for additional site-specific sampling requirements related to capital dredging projects, or projects located in areas with known contaminants sources.

[2] For capital dredging projects, sub-surface sampling is also required. The number of sub-surface samples, the depths of these samples, and the methods of sub-surface sampling are all site-dependent. Environment Canada should be consulted for site-specific guidance.

APPENDIX 3

Sediment and Water Quality Field Data

Table 3-1 Water Quality Sampling Site Coordinates

Area	Station ID	Easting	Northing
Berth 1	WQ BA	411223	6012709
Berth 2	WQ BB	411138	6011589
MOF	WQ PM	410306	6015579

NOTES:
Water quality sampling was completed during the preliminary field program (December 2014).
Sample locations were geo-referenced using a vessel-mounted GPS.

Table 3-2 PRPA Water Quality Monitoring Sites

Site ID	Location	Easting	Northing
7	Fairview Terminal	411185	6016446
8	Harbour Entrance	410398	6010316
9	North Ridley	412875	6010644
29	Phillips Point	411372	6014046
31	Tuck Island	411137	6011589
32	Casey Cove	410306	6015579

Table 3-3 Sediment Sampling Site Coordinates and Qualitative Field Observations

Sample Site ID	Sample Method	Sample Depth (m)	Coordinates		Sample Date	Material and Biological Content	Colour/Odour
			Easting	Northing			
Berth 1							
BA01	Standard ponar	0.075 m	411275	6012701	15-Dec-14	Sandy silt with some clay, 1 cobble with shell hash, 4 brittle sea stars, 1 hermit crab, woody debris.	Brownish grey with pockets of black. No odour.
BA02	Standard ponar	0.075 m	411159	6012701	15-Dec-14	Fine sand with 2 cm surface layer of shell hash, some gravel. Bull kelp stipe, lots of shell hash, some woody debris.	Grey with black pockets, beige and brown surface layer. No odour.
BA03	Standard ponar	0.075 m	411163	6012608	15-Dec-14	Silt with some sand, trace clay, trace cobble and gravel. Orange anemone, seaweed, shell hash and some full shells (including scallop shell), 1 blade unrooted eelgrass.	Medium grey with pockets of black. No odour.
BA04*	Standard ponar	0.075 m	411157	6012429	15-Dec-14	1 cm surface layer of loose, silt then silt with sand, quite dense. Some worms, some organics.	Brown surface layer, then medium grey with black organic pockets. No odour.
BA05	Standard ponar	0.075 m	411161	6012332	15-Dec-14	1 cm surface layer of loose, silt then silt with sand, quite dense. Shell hash, amphipods, some worms.	Brown surface layer, then medium grey with black organic pockets. No odour.
BA06	Standard ponar	0.075 m	411246	6012318	16-Dec-14	1 cobble, 1 cm surface layer of loose, wet silt then silt with some sand. Trace woody debris and shell hash.	Light brown surface layer, then medium grey. No odour.
PCL01	Vibracore	0-0.5	411162	6012710	16-Jan-16	Primarily shell hash and sand with silt. Moist, a couple surface cobble and black organics, traces of woody debris throughout.	Medium grey. No odour
		0.5-1.0				Primarily shell hash and sand, some silt, some cobble. Fairly moist. Woody debris throughout.	Medium grey. No odour
		1.0-1.5				Shell hash and sand with some bigger shells. More firm than shallower layers. Woody debris throughout.	Medium grey. No odour
		1.5-2.0				More sandy with shell hash and cobbles present, some silt. Some larger shells.	Medium grey. Anoxic smell.
PCS01	Vibracore	0-0.2	411162	6012710	16-Jan-16	Moist sand with lots of shell hash, some silt. Trace woody debris and a couple full shells.	Medium grey. No odour.
		0.2-0.4				Moist sand with shell hash. Woody debris.	Medium grey. No odour.
		0.4-0.6				Moist sand with shell hash. Woody debris and one large shell.	Medium grey. No odour.
		0.6-0.8				Moist sand with shell hash. Woody debris and some large shells.	Medium grey. No odour.
		0.8-1.0				Moist sand with shell hash. Woody debris and one large shell.	Medium grey. No odour.
		1.0-1.2				Moist sand with shell hash. Woody debris.	Medium grey. No odour.
		1.2-1.4				Moist sand with shell hash. Woody debris.	Medium grey. No odour.
PCL02	Vibracore	0-0.5	411261	6012681	31-Jan-16	Clay with some silt, sparse shell hash throughout.	Dark grey. Slight anoxic odour.
		0.5-1.0				Silt with pockets of clay. Abundant shell hash.	Light grey. No odour.
		1.0-1.3				Silt with some large cobble. Shell hash throughout.	Light grey. Slight anoxic odour.
PCS02	Vibracore	0-0.2	411261	6012705	31-Jan-16	Clay with some silt and sparse shell hash.	Dark grey with black streaks. Slight anoxic odour.
		0.2-0.4				Silt with clay pockets and abundant shell hash.	Light grey with black streaks. No odour.
		0.4-0.6				Silt with clay and abundant shell hash.	Light grey. No odour.
		0.6-0.68				Silt with abundant shell hash.	Light grey. No odour.
PCL03	Vibracore	0-0.5	411200	6012670	16-Jan-16	Mainly silt with sand, a couple pieces of cobble, quite moist. Some shell hash, 2 full shells, and trace woody debris.	Medium grey throughout with a few black patches. No odour.
PCL04	Vibracore	0-0.5	411168	6012599	30-Jan-16	Clay with a bit of silt. Shell hash throughout with sparse, fine woody debris.	Light grey with dark patches. No odour.
		0.5-1.0				Silt with a bit of clay. Shell hash throughout with large intact shells.	Light grey. No odour.
		1.0-1.5				Silt with pockets of clay. Shell hash throughout.	Light grey. No odour.

Table 3-3 Sediment Sampling Site Coordinates and Qualitative Field Observations

Sample Site ID	Sample Method	Sample Depth (m)	Coordinates		Sample Date	Material and Biological Content	Colour/Odour
			Easting	Northing			
PCL05	Vibracore	0-0.5	411184	6012651	31-Jan-16	Clay with silt and shell hash throughout.	Light grey. No odour.
		0.5-1.0				Silt with abundant shell hash.	Light grey. No odour.
		1.0-1.2				Silt with abundant shell hash. High moisture content.	Light grey. No odour.
PCL06	Vibracore	0-0.5	411180	6012403	31-Jan-16	Clay with trace shell hash and woody debris.	Dark grey. No odour.
		0.5-1.0				Clay with shell hash throughout.	Dark grey. Anoxic odour.
		1.0-1.5				Clay with sparse shell hash throughout.	Dark grey. Slight anoxic odour.
		1.5-2.0				Clay with trace shell hash and one piece of cobble.	Dark grey. No odour.
		2.0-2.4				Clay with sparse cobble and trace shell hash.	Medium grey. No odour.
PCS06	Vibracore	0-0.2	411179	6012404	31-Jan-16	Clay.	Dark grey with black patches. No odour.
		0.2-0.4				Clay with sparse shell hash.	Dark grey with black streaks. Slight anoxic odour.
		0.4-0.6				Clay with sparse shell hash.	Dark grey with black streaks. No odour.
		0.6-0.8				Clay with sparse shell hash.	Dark grey with black streaks. Slight anoxic odour.
		0.8-1.0				Clay with shell hash throughout.	Dark grey. No odour.
		1.0-1.2				Clay with sparse shell hash and one piece of cobble.	Dark grey. No odour.
		1.2-1.4				Clay with sparse shell hash and sparse cobble.	Dark grey. No odour.
PCL07	Vibracore	0-0.5	411150	6012377	15-Jan-16	Firm silt with clay, some sand. Trace shell hash at ~0.5 m. Worms present.	Medium grey with dark grey patches. No odour.
		0.5-1.0				Firm silt with clay, some sand. Some shell hash.	Medium grey. No odour.
		1.0-1.5				Firm silt with clay and sand, less dense than shallower layers. Some shell hash and trace organics	Medium grey. No odour.
		1.5-2.0				Firm silt with clay and sand, one large cobble. Trace shells.	Medium grey. No odour.
		2.0-2.5				Silty sand, slightly drier than shallower layers. Trace shells.	Medium grey. No odour.
PCL08	Vibracore	0-0.5	411226	6012319	1-Feb-16	Clay/silt with sparse shell hash. One large worm.	Dark grey. No odour.
		0.5-1.0				Silt/clay with shell hash throughout. Some large intact shells.	Dark grey. No odour.
		1.0-1.3				Silt with sparse cobble. Shell hash and intact shells throughout.	Light grey. No odour.
PCS08*	Vibracore	0-0.2	411213	6012316	1-Feb-16	Silt/clay with sparse shell hash throughout and woody debris.	Dark grey with black streaks. No odour.
		0.2-0.4				Clay with some silt and sparse shell hash throughout.	Dark grey. Slight odour.
		0.4-0.6				Silt with clay. Shell hash throughout.	Dark grey with brown pockets. No odour.
		0.6-0.8				Silt with clay. Shell hash throughout with a few full shells.	Dark grey. No odour.
		0.8-1.06				Silt/clay with sparse shell hash.	Medium grey. No odour.
PCL09	Vibracore	0-0.5	411209	6012344	18-Jan-16	Firm, damp silt, some sand, some clay. Trace shell hash and woody debris.	Top half more black, remainder medium grey. No odour.
		0.5-1.0				Sandy silt with clay, firm. Trace shell hash throughout.	Medium grey. No odour.
		1.0-1.5				Sandy silt with clay, firm. Trace shell hash throughout.	Medium grey. No odour.
		1.5-2.05				Sandy silt. Trace shell hash throughout.	Medium grey. No odour.

Table 3-3 Sediment Sampling Site Coordinates and Qualitative Field Observations

Sample Site ID	Sample Method	Sample Depth (m)	Coordinates		Sample Date	Material and Biological Content	Colour/Odour
			Easting	Northing			
PCL10*	Vibracore	0-0.5	411143	6012311	19-Jan-16	Moist sandy silt. Defined shell hash at 0.4-0.5 m, black charcoal type pocket.	Medium grey. No odour.
		0.5-1.0				Moist, loose, sandy silt with pockets of clay. Shell hash throughout, some intact shells.	Medium grey. No odour.
		1.0-1.5				Moist, loose silty sand with the bottom 5 cm a firm clay. Intact shells and shell hash throughout with trace organics.	Medium grey. No odour.
		1.5-1.86				Very firm silt throughout; deepest ~10 cm is cobble. Trace shell hash.	Medium grey with brown patches. No odour.
PCS10	Vibracore	0-0.2	411161	6012307	19-Jan-16	Damp sandy silt with clay, moderate firmness. One cobble at surface. Trace shell hash and organics.	Medium grey with black pockets. No odour.
		0.2-0.4				Sandy silt with clay. Trace shell hash and organics.	Medium grey with black pockets. No odour.
		0.4-0.6				Moist silt with sand and pockets of clay, one cobble. Defined shell hash at ~10 cm.	Medium grey. No odour.
		0.6-0.8				Moist and loose silt with sand. One cobble, some bigger shells. Trace shell hash throughout.	Medium grey. No odour.
		0.8-1.0				Moist and loose silt with sand. Shell hash throughout.	Medium grey. No odour.
		1.0-1.2				Moist and loose silt with sand, some cobble. Intact shells and shell hash throughout. One large piece of bark.	Medium grey. No odour.
		1.2-1.4				Quite firm silt with sand and cobble; most cobble at the tip (deepest portion). Intact shells and shell hash throughout.	Medium grey. No odour.
SS01*	Standard ponar	0-0.075	411219	6012681	20-Jan-16	Top layer has a couple of cobbles, remainder is moist silt with some sand and clay. Trace pieces of shell and some worms and organics (wood).	Top layer is brown, remainder is medium grey. No odour.
SS02	Standard ponar	0-0.075	411179	6012650	20-Jan-16	Top layer (~1cm) is loose silt, remainder is silt with sand and some clay. Trace shell and shell hash throughout with some organics.	Top layer is brown, remainder is medium grey. No odour.
SS03	Standard ponar	0-0.075	411183	6012360	20-Jan-16	Top layer is soft silt while the remainder is silt with some sand and clay. Some barnacles on top, trace shell hash and organics.	Top layer brown, remainder medium grey with black patches. No odour.
Berth 2							
BB01	Standard ponar	0.075 m	411161	6011662	16-Dec-14	Surface layer of shell hash then silt with shell hash. Some woody debris.	Grey silt. No odour.
BB02*	Standard ponar	0.075 m	411261	6011618	16-Dec-14	1 cm surface layer of loose, wet silt then silt with some sand, trace gravel and clay pockets. Several full shells, some shell hash and woody debris, 1 worm.	Light brown surface layer, then medium grey. No odour.
BB03	Standard ponar	0.075 m	411358	6011664	16-Dec-14	0.5 cm surface lager of loose/wet silt with some shell hash, then silt with trace clay, trace gravel. Trace woody debris.	Light brown surface layer, then medium grey. No odour.
PCL11*	Vibracore	0-0.5	411133	6011626	18-Jan-16	Damp silt with clay. Trace shell hash.	Medium grey with black pockets. Slight anoxic odour.
		0.5-1.0				Moist silt with clay, some sand. More shell hash than shallower layer.	Medium grey. No odour.
		1.0-1.5				Top 20 cm: moist silt with clay, some sand. Remainder: silty sand, trace cobbles, moist. Trace shell hash.	Medium grey. No odour.
		1.5-2.0				Firmer silt with sand and clay with much more cobble than shallower interval. Trace shell hash and pieces of charcoal.	Dark grey. No odour.
PCS11	Vibracore	0-0.2	411133	6011626	18-Jan-16	Firm silt with clay, trace sand. Trace shell hash.	Medium grey with some brown. No odour.
		0.2-0.4				Firm silt with clay, trace sand. Minor trace shell hash and a few pieces of organics.	Medium grey with black pockets. No odour.
		0.4-0.6				Firm silt with clay, trace sand. Trace shell hash.	Medium grey with black pockets. No odour.
		0.6-0.8				Not quite as firm as shallower layers. Silt with clay and some sand. Trace shell hash.	Medium grey with a few black striations. No odour.
		0.8-1.0				Silt with clay, some sand. Trace shell hash.	Medium grey. No odour.
		1.0-1.2				Silt with clay. Top ~15 cm had very little sand. Bottom ~5 cm had much more sand.	Medium grey. No odour.
		1.2-1.32				Silty sand. Trace shell hash.	Medium grey. No odour.
		1.32-1.57				Silty sand. Trace shell hash.	Medium grey. No odour.

Table 3-3 Sediment Sampling Site Coordinates and Qualitative Field Observations

Sample Site ID	Sample Method	Sample Depth (m)	Coordinates		Sample Date	Material and Biological Content	Colour/Odour
			Easting	Northing			
PCL12	Vibracore	0-0.5	411166	6011634	30-Jan-16	Clay with some silt. Sparse shell hash, trace worms.	Dark grey with black streaks. Slight anoxic odour.
		0.5-1.0				Clay with some silt. Pockets of shell hash.	Medium grey. No odour.
		1.0-1.3				Moist silt with clay and shell hash throughout. Some intact shells.	Medium grey. No odour.
PCL13	Vibracore	0-0.5	411193	6011648	30-Jan-16	Silt with pockets of clay. Abundant shell hash and large shell pieces.	Light grey. No odour.
		0.5-1.0				Silt with shell hash throughout. Couple of large, intact shells and large cobble pieces.	Light grey. No odour.
		1.0-1.3				Silt, sparse cobble. Abundant shell hash.	Light grey. No odour.
PCS13	Vibracore	0-0.2	411191	6011646	30-Jan-16	Clay with some silt. Sparse shell hash.	Dark grey. Slight anoxic odour.
		0.2-0.4				Silt with pockets of clay. Shell hash throughout and sparse cobble. Fine woody debris throughout.	Light grey. No odour.
		0.4-0.7				Silt with clay pockets and sparse cobble. Shell hash throughout with fine woody debris.	Light grey with dark patches. No odour.
PCL14	Vibracore	0-0.5	411215	6011616	29-Jan-16	Clay with trace shell hash and woody debris.	Dark grey with black streaks. No odour.
		0.5-1.0				Clay with some large gravel and a band of shell hash.	Dark grey. No odour.
		1.0-1.5				Silt with pockets of clay. Abundant cobble throughout. Lots of shell hash and large shells throughout.	Dark grey. No odour.
		1.5-2.0				Silt with pockets of olive green silt. Very damp with pockets of shell hash. Pieces of gravel throughout.	Dark grey with pockets of olive green. No odour.
PCS14	Vibracore	0-0.2	411209	6011615	29-Jan-16	Wet clay with trace woody debris. Sparse shells and worms.	Dark grey with pockets of brown. No odour.
		0.2-0.4				Clay.	Medium grey. No odour.
		0.4-0.6				Clay with pockets of shell hash and trace woody debris.	Dark grey with black striations and brown patches. No odour.
		0.6-0.8				Clay with sparse shell hash.	Dark grey. No odour.
		0.8-1.0				Clay with pockets of shell hash and gravel. A few large stones.	Dark grey. No odour.
		1.0-1.2				Clay with trace silt. Pockets of shell hash and trace gravel.	Dark grey. No odour.
		1.2-1.4				Mix of silt and clay. Moderate shell hash.	Dark grey. No odour.
PCL15	Vibracore	0-0.5	411207	6011627	15-Jan-16	Silt with sand and clay, some gravel. Shell hash and one worm.	Medium grey. No odour
PCL18	Vibracore	0-0.5	4113039	6011631	18-Jan-16	Mostly silt, moist, 2 big cobbles, sand silt. Trace shell hash throughout.	Medium grey. No odour.
PCS19*	Vibracore	0-0.2	411355	6011663	20-Jan-16	Moist silt with sand and one large cobble. Shell hash throughout.	Medium grey. No odour.
		0.2-0.4			20-Jan-16	Top is moist, firm, silt with sand. Bottom is loose silt and sand with shell and cobble. 30-40 cm deep: lots of shell hash.	Medium grey. No odour.
		0.4-0.65			20-Jan-16	Loose sand with cobbles. Shell hash throughout.	Medium grey. No odour.
SS04	Shipek	0-0.075	411128	6011621	26-Jan-16	Silty, pockets of clay, sparse cobble. Trace worms.	Dark grey. No odour.
SS05	Shipek	0-0.075	411134	6011649	30-Jan-16	Wet clay with sparse large shells.	Light grey. No odour.
SS06	Shipek	0-0.075	411197	6011631	30-Jan-16	Wet clay with cobble throughout with barnacles. Worms and worm casings.	Dark grey. No odour.
MOF							
PM01	Standard ponar	0.075 m	410638	6015517	18-Dec-14	Fine sand, some silt. Two large clam shells, trace shells hash and organic matter, 1 worm.	Medium grey. No odour.
PM02*	Standard ponar	0.075 m	410465	6015521	18-Dec-14	0.5 cm surface layer of loose silt then silt with some sand, trace clay. Large clam shells, large woody debris, 1 worm, trace shell hash, trace rootlets.	Brown surface layer then medium grey. No odour.
PM03	Standard ponar	0.075 m	410292	6015525	18-Dec-14	0.5 cm surface layer of loose silt then silt with some sand, trace clay. Lots of medium woody debris, 1 worm.	Brown surface layer then medium grey. No odour.

Table 3-3 Sediment Sampling Site Coordinates and Qualitative Field Observations

Sample Site ID	Sample Method	Sample Depth (m)	Coordinates		Sample Date	Material and Biological Content	Colour/Odour
			Easting	Northing			
PCL21	Vibracore	0-0.5	410321	6015588	3-Feb-16	Silt/clay with sparse shell hash.	Dark grey. No odour.
		0.5-1.0				Silt with pockets of clay. Shell hash throughout with some intact shell and some fine woody debris.	Light grey with brown pockets. No odour.
		1.0-1.5				Silt in top half, sand towards 1.5 m. Shell hash and intact shell throughout with some woody debris.	Light grey. No odour.
		1.5-1.65				Sand/silt with sparse shell hash and intact shells.	Light grey. No odour.
PCS21	Vibracore	0-0.2	410856	6015494	19-Jan-16	Silty sand with cobble. Shell hash and intact shells, some organics.	Medium grey and patches of brown. No odour.
PCL22	Vibracore	0-0.4	410671	6015483	17-Jan-16	Sand and shell hash, damp, with a few cobbles and one clam shell.	Medium grey. No odour.
PCL23*	Vibracore	0-0.5	410585	6015525	2-Feb-16	Silt with clay and sand. Sparse shell hash throughout with fine woody debris.	Dark grey. No odour.
		0.5-1.0				Silt with sand and clay. Intact shells and sparse cobble with pockets of shell hash.	Light grey. No odour.
		1.0-1.5				Sand and silt/clay. Large pockets of shell hash with intact shells.	Light grey. No odour.
		1.5-2.0				Sand with silt and cobble. Lots of shell hash throughout and intact shells.	Light grey. No odour.
		2.0-2.2				Sand with silt and cobble. Lots of shell hash throughout and intact shells.	Light grey. No odour.
PCL24	Vibracore	0-0.5	410502	6015512	17-Jan-16	Moist, firm, mostly silt with pockets of clay and some sand. Trace cobble and shell hash.	Medium grey with black organic pockets. No odour.
		0.5-1.0				Dense, firm, fine silt and clay with some sand. Trace shell hash with some larger shell pieces.	Medium grey. No odour.
		1.0-1.5				Silty sand, trace cobbles. Shell hash throughout with some larger pieces.	Medium grey. No odour.
		1.5-2.0				Silty sand with more cobbles near the deeper layers. Bottom 10 cm is firm clay with cobble. At 1.90 m there is a layer of woody debris.	Medium grey. No odour.
PCS24*	Vibracore	0-0.2	410502	6015512	17-Jan-16	Moist silt, some sand, some clay. Trace shell hash and some organics.	Medium grey with black pockets. No odour.
		0.2-0.4				Moist sandy silt, some clay. Some shell hash, woody debris.	Medium grey with black pockets. No odour.
		0.4-0.6				Moist sandy silt, some clay. One large cobble. Trace shell hash.	Medium grey. No odour.
		0.6-0.8				Sandy silt. Some shell hash, some larger shells.	Medium grey. No odour.
		0.8-1.0				Sandy silt. Some shell hash, some larger shells.	Medium grey. No odour.
		1.0-1.2				Sandy silt, more moisture than shallower layers. Some shell hash, some larger shell pieces.	Medium grey. No odour.
PCL25	Vibracore	0-0.5	410413	6015593	20-Jan-16	Predominantly firm and moist silt with sand and clay. Very trace shell hash and trace woody debris.	Dark grey with lighter/medium grey patches. No odour.
		0.5-1.0				Predominantly firm and moist silt with sand and clay. Trace shell hash and organics.	Medium grey. No odour.
		1.0-1.5				Damp and firm silt with sand and clay. Trace shell hash.	Medium grey. No odour.
		1.5-2.0				Silty sand with clay. Trace shell hash.	Medium grey. No odour.
		2.0-2.5				Damp and loose silty sand. Trace shell hash and organics.	Medium grey. Mild anoxic odour.
PCS25	Vibracore	0-0.2	410423	6015602	20-Jan-16	Firm, moist silt with sand and clay. Trace woody debris.	Dark grey. No odour.
		0.2-0.4				Firm, damp silt with some sand and clay.	Dark grey with patches of medium brown. No odour.
		0.4-0.6				Firm, moist silt with sand and clay. Organic pockets.	Medium grey. No odour.
		0.6-0.8				Firm, moist silt with some sand and clay. Trace shell hash.	Medium grey. No odour.
		0.8-1.0				Firm, moist silt with some sand and clay. Very trace shell hash.	Medium grey. No odour.
		1.0-1.2				Firm, damp silt with some sand and clay. Slightly more sand than shallower layer. Trace shell hash.	Medium grey. No odour.
		1.2-1.4				Firm, damp silt with some sand and clay. Trace shell hash and woody debris.	Medium grey. No odour.

Table 3-3 Sediment Sampling Site Coordinates and Qualitative Field Observations

Sample Site ID	Sample Method	Sample Depth (m)	Coordinates		Sample Date	Material and Biological Content	Colour/Odour
			Easting	Northing			
PCL26	Vibracore	0-0.5	410401	6015491	28-Jan-16	Silt/clay with sparse shell hash.	Dark grey with some black streaks. Faint anoxic odour.
		0.5-1.0				Silt/clay with sparse shell hash.	Dark grey. No odour.
		1.0-1.5				Silt/clay with trace shell hash and large shells.	Dark grey. Slight anoxic odour.
		1.5-2.0				Silt/clay with sparse shell hash.	Dark grey. No odour.
		2.0-2.3				Silt/sand with sparse shell hash.	Dark grey. Slight odour.
PCL27	Vibracore	0-0.5	410296	6015559	28-Jan-16	Silt/clay with sparse shell hash.	Dark grey. Slight anoxic odour.
		0.5-1.0				Silt/clay with trace shell hash.	Dark grey. Slight anoxic odour.
		1.0-1.5				Silt/clay with hard compacted clay in centre. Some large shells and trace shell hash.	Dark grey. Slight anoxic odour.
		1.5-1.7				Hard compacted clay with sparse shell.	Dark grey. No odour.
PCL28	Vibracore	0-0.5	410285	6015510	28-Jan-16	Silt/clay with sparse shell hash.	Dark grey. No odour.
		0.5-1.0				Silt/clay with sparse shell hash.	Dark grey. Slight anoxic odour.
		1.0-1.5				Silt/clay with sparse shell hash.	Light grey. Strong anoxic odour.
		1.5-2.0				Silt/clay with woody debris and abundant shell hash.	Light grey and pockets of red. Strong anoxic odour.
		2.0-2.27				Silt/clay with woody debris and sparse shell hash.	Dark grey. Strong anoxic odour.
PCL29	Vibracore	0-0.5	410350	6015654	2-Feb-16	Clay with sparse shell hash and one clam.	Dark grey. No odour.
		0.5-1.0				Silt/clay with pockets of sand. Sparse shell hash and woody debris.	Dark grey. No odour.
		1.0-1.5				Silt with some clay. Lots of intact shells and some fine woody debris.	Dark grey. Strong anoxic odour.
		1.5-2.0				Sand with swoody debris and some intact shells.	Dark grey. Slight anoxic odour.
		2-2.34				Sand with pockets of clay.	Medium grey. No odour.
PCS29	Vibracore	0-0.2	401291	6015606	21-Jan-16	Moist, loose, sand and silt. Shell hash throughout.	Medium grey. No odour.
		0.2-0.4				Moist, loose, sand and silt. Shell hash throughout.	Medium grey. No odour.
		0.4-0.6				Firmer, moist, silty sand. Shell hash throughout and trace woody debris.	Medium grey. No odour.
		0.6-0.8				Firmer, moist, silty sand. Shell hash throughout and trace woody debris.	Medium grey. No odour.
		0.8-1.0				Damp, firm, silty sand. Shell hash throughout and some bigger pieces of shell. Trace woody debris.	Medium grey. No odour.
		1.0-1.2				~110 to 120 cm: much more dense shell layer; remainder: Damp, firm, silty sand. Shell hash throughout. Trace woody debris.	Medium grey. No odour.
PCL30*	Vibracore	0-0.5	410422	6015735	29-Jan-16	Clay with pockets of silt, sparse shell hash.	Dark grey with black pockets. No odour.
		0.5-1.0				Clay with some silt. Pockets of concentrated shell and sparse woody debris.	Light grey. No odour.
		1.0-1.5				Silt with some clay. Shell hash throughout with big shells and lots of wood.	Light grey. No odour.
		1.5-2.0				Silt, abundant shell hash and large shells.	Light grey. No odour.
		2.0-2.15				Silt with sparse shell hash and large shells. Sparse fine woody debris.	Light grey. No odour.
PCL31	Vibracore	0-0.5	410282	6015735	29-Jan-16	Silt with some clay. Abundant shell hash and large pieces of shell.	Light grey with black streaks. No odour.
		0.5-1.0				Silt with shell hash and some large shells.	Dark grey. No odour.
		1.0-1.25				Silt with sparse shell hash and some large shells.	Dark grey. No odour.

Table 3-3 Sediment Sampling Site Coordinates and Qualitative Field Observations

Sample Site ID	Sample Method	Sample Depth (m)	Coordinates		Sample Date	Material and Biological Content	Colour/Odour
			Easting	Northing			
PCL32	Vibracore	0-0.5	410419	6015781	28-Jan-16	Mix of silt and clay. Sparse shell hash.	Light grey. No odour.
		0.5-1.0				Coarse silt. Abundant shell hash.	Light grey. No odour.
		1.0-1.5				Sand and silt. Abundant shell hash with large shell pieces.	Light grey. No odour.
		1.5-1.82				Silt and sand. Abundant shell hash and large shells.	Light grey. No odour.
PCS32	Vibracore	0-0.2	410449	6015793	2-Feb-16	Clay with sparse shell hash.	Dark grey. Slight anoxic odour.
		0.2-0.4				Silt with dark patches. Shell hash throughout with some intact shells and sparse woody debris.	Medium grey. No odour.
		0.4-0.6				Clay with silt and shell hash throughout.	Light grey. No odour.
		0.6-0.8				Sand/silt with some pockets of clay. Lots of shell hash throughout with intact shells and some cobble.	Dark grey. No odour.
		0.8-1.0				Sand and silt with some clay. Intact shells and abundant shell hash.	Light grey. Slight anoxic odour.
		1.0-1.2				Sand with silt and some cobble. Shell hash throughout with lots of intact shells.	Light grey. No odour.
		1.2-1.4				Sand and silt with lots of cobble. Abundant shell hash and some intact shells.	Light grey. No odour.
PCL33	Vibracore	0-0.5	410534	6015878	19-Jan-16	Silty sand with shells and cobble. Lots of shells in bottom 20 cm.	Medium grey with black organic pockets.
PCS33	Vibracore	0-0.2	410501	6015860	19-Jan-16	Silty sand with shells and cobble. Large shells and lots of shells clogging core sample.	Medium grey. No odour.
SS10	Shipek	0-0.075	410323	6015522	3-Feb-16	Clay/silt with large intact shells, worm casings, fine woody debris, and shell hash.	Dark grey. No odour.
SS11	Shipek	0-0.075	410621	6015468	21-Jan-16	Silty sand. One blade of unrooted eelgrass, a couple worms, shell hash throughout, trace organic matter.	Surface layer is black, below that: medium gray. No odour.
SS12	Shipek	0-0.075	410490	6015599	2-Feb-16	Silt/clay with large pieces of rock. Fine woody debris with fine woody debris, intact shell, and worms.	Dark grey with black pockets. No odour.
SS13*	Shipek	0-0.075	410357	6015558	3-Feb-16	Clay with sparse fine woody debris.	Light grey with dark patches. Slight anoxic odour.
SS14	Shipek	0-0.075	410268	6015598	2-Feb-16	Clay with silt and sparse fine woody debris.	Dark grey. No odour.
SS15	Shipek	0-0.075	410341	6015702	3-Feb-16	Silt with pockets of clay. Sparse gravel, dine woody debris, sparse shell hash with intact shells.	Light grey with dark patches. No odour.
SS16	Shipek	0-0.075	410285	6015706	2-Feb-16	Silt and clay with sparse cobble. Worm casings, shell, and woody debris.	Dark grey with black pockets. No odour.
SS17	Shipek	0-0.075	410341	6015793	26-Jan-16	Sand with some gravel. Lots of shell hash, fine woody debris.	Light grey. No odour.
SS18	Shipek	0-0.075	410372	6015783	2-Feb-16	Sand with shell hash throughout.	Dark grey. No odour.
SS19	Shipek	0-0.075	410525	6015828	26-Jan-16	Mix of clay with some gravel.	Dark grey. Slight anoxic odour.

NOTES:
* Field duplicate samples taken at these sites
Sample locations were geo-referenced using a vessel-mounted GPS

APPENDIX 4

Laboratory Reports: Sediment and Water Quality Data

APPENDIX 4.1

Sediment Data

STANTEC CONSULTING LTD.
ATTN: Molly Brewis
4370 Dominion Street, 5th Floor
Burnaby BC V5G 4L7

Date Received: 18-DEC-14
Report Date: 28-JAN-15 14:45 (MT)
Version: FINAL

Client Phone: 604-436-3014

Certificate of Analysis

Lab Work Order #: L1560354

Project P.O. #: NOT SUBMITTED
Job Reference: 123220054 TASK 225.101
C of C Numbers:
Legal Site Desc:

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1560354-1	L1560354-2	L1560354-3	L1560354-4	L1560354-5
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	15-DEC-14	15-DEC-14	15-DEC-14	15-DEC-14	15-DEC-14
	Sampled Time	12:30	13:32	13:21	14:06	14:25
	Client ID	SM01	SM02	SM03	BA01	BA02
Grouping	**Analyte**					
SOIL						
Physical Tests	Moisture (%)	25.3	24.9	32.6	41.4	35.6
	pH (1:2 soil:water) (pH)	8.12	8.14	7.89	8.05	8.26
Particle Size	% Gravel (>2mm) (%)	0.16	<0.10	0.12	2.39	11.2
	% Sand (2.00mm - 1.00mm) (%)	0.43	0.52	<0.10	1.31	8.83
	% Sand (1.00mm - 0.50mm) (%)	2.04	2.82	0.44	1.18	10.3
	% Sand (0.50mm - 0.25mm) (%)	19.9	18.2	3.31	4.89	15.0
	% Sand (0.25mm - 0.125mm) (%)	60.6	56.0	29.0	13.6	15.9
	% Sand (0.125mm - 0.063mm) (%)	11.0	13.6	41.3	11.9	13.2
	% Silt (0.063mm - 0.0312mm) (%)	3.43	5.03	14.1	14.6	8.10
	% Silt (0.0312mm - 0.004mm) (%)	1.25	2.58	8.28	30.2	10.9
	% Clay (<4um) (%)	1.19	1.14	3.46	19.9	6.54
	Texture	Sand	Sand	Loamy sand	Loam	Sandy loam
Organic / Inorganic Carbon	Total Organic Carbon (%)	0.42	0.61	1.01	1.56	1.51
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	3440	2380	4560	9400	5520
	% Saturation (%)	25.4	27.9	35.0	55.6	37.9
	Sodium (Na) (mg/kg)	1740	1300	2410	4900	2900
Metals	Aluminum (Al) (mg/kg)	5200	5730	7690	16400	8190
	Antimony (Sb) (mg/kg)	<0.10	<0.10	0.13	0.63	0.22
	Arsenic (As) (mg/kg)	1.52	1.41	3.54	6.88	4.49
	Barium (Ba) (mg/kg)	54.7	60.6	83.0	86.8	82.9
	Beryllium (Be) (mg/kg)	<0.20	<0.20	<0.20	0.35	<0.20
	Bismuth (Bi) (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
	Cadmium (Cd) (mg/kg)	<0.050	<0.050	0.139	0.142	0.113
	Calcium (Ca) (mg/kg)	3140	3860	4250	13300	99500
	Chromium (Cr) (mg/kg)	7.82	9.43	12.9	24.5	12.5
	Cobalt (Co) (mg/kg)	2.08	2.27	3.70	9.66	4.49
	Copper (Cu) (mg/kg)	2.22	2.68	7.29	30.1	11.9
	Iron (Fe) (mg/kg)	7000	7720	11800	28500	13900
	Lead (Pb) (mg/kg)	1.42	1.56	2.57	8.13	4.06
	Lithium (Li) (mg/kg)	5.5	6.7	9.9	19.9	7.9
	Magnesium (Mg) (mg/kg)	2890	3380	4730	8900	5250
	Manganese (Mn) (mg/kg)	102	99.5	146	393	200
	Mercury (Hg) (mg/kg)	0.0070	0.0075	0.0177	0.0516	0.0241
	Molybdenum (Mo) (mg/kg)	0.59	0.55	1.12	1.19	0.67
	Nickel (Ni) (mg/kg)	4.35	4.93	7.84	20.7	9.53
	Phosphorus (P) (mg/kg)	652	624	802	894	605

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1560354-6 Sediment 15-DEC-14 14:46 BA03	L1560354-7 Sediment 15-DEC-14 15:04 BA04	L1560354-8 Sediment 15-DEC-14 15:29 BA05	L1560354-9 Sediment 16-DEC-14 10:01 BA06	L1560354-10 Sediment 16-DEC-14 10:24 BB01
Sample ID / Description / Sampled Date / Sampled Time / Client ID						
SOIL						
Physical Tests	Moisture (%)	44.5	40.9	44.9	40.3	37.1
	pH (1:2 soil:water) (pH)	8.02	7.78	7.83	8.04	8.15
Particle Size	% Gravel (>2mm) (%)	4.00	0.58	1.58	0.98	7.74
	% Sand (2.00mm - 1.00mm) (%)	1.07	0.33	0.20	2.28	11.4
	% Sand (1.00mm - 0.50mm) (%)	1.28	0.16	0.27	2.20	13.5
	% Sand (0.50mm - 0.25mm) (%)	2.94	0.53	1.34	6.48	12.5
	% Sand (0.25mm - 0.125mm) (%)	8.64	2.74	13.9	9.82	6.03
	% Sand (0.125mm - 0.063mm) (%)	10.3	6.21	12.3	7.76	5.35
	% Silt (0.063mm - 0.0312mm) (%)	15.7	17.1	15.8	13.7	6.91
	% Silt (0.0312mm - 0.004mm) (%)	34.1	43.9	33.4	33.5	20.0
	% Clay (<4um) (%)	22.0	28.5	21.2	23.3	16.6
	Texture	Silt loam	Silt loam	Silt loam	Silt loam	Sandy loam
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.73	2.10	1.73	1.47	1.35
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	11900	15000	11400	9490	7630
	% Saturation (%)	59.9	72.3	59.2	59.6	46.8
	Sodium (Na) (mg/kg)	5890	7190	5800	5020	3930
Metals	Aluminum (Al) (mg/kg)	17600	22700	17700	17500	11200
	Antimony (Sb) (mg/kg)	0.67	0.95	0.65	0.76	0.36
	Arsenic (As) (mg/kg)	8.03	10.2	9.27	8.68	6.67
	Barium (Ba) (mg/kg)	82.5	98.1	90.6	88.4	62.4
	Beryllium (Be) (mg/kg)	0.38	0.45	0.32	0.34	0.23
	Bismuth (Bi) (mg/kg)	<0.20	0.22	<0.20	<0.20	<0.20
	Cadmium (Cd) (mg/kg)	0.149	0.191	0.132	0.160	0.153
	Calcium (Ca) (mg/kg)	18600	8020	10000	22900	179000
	Chromium (Cr) (mg/kg)	25.7	33.4	26.6	25.9	16.4
	Cobalt (Co) (mg/kg)	10.5	13.1	10.3	10.4	6.94
	Copper (Cu) (mg/kg)	32.6	46.5	32.7	33.1	18.6
	Iron (Fe) (mg/kg)	31000	38600	30900	30500	19400
	Lead (Pb) (mg/kg)	8.70	11.6	9.10	8.90	5.77
	Lithium (Li) (mg/kg)	19.9	25.1	18.2	20.0	13.3
	Magnesium (Mg) (mg/kg)	9600	12400	9930	9280	10700
	Manganese (Mn) (mg/kg)	415	529	415	416	329
	Mercury (Hg) (mg/kg)	0.0590	0.0735	0.0554	0.0620	0.0326
	Molybdenum (Mo) (mg/kg)	1.37	2.37	1.35	1.41	0.54
	Nickel (Ni) (mg/kg)	22.8	29.7	22.1	22.1	14.3
	Phosphorus (P) (mg/kg)	919	1070	966	954	696

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1560354-11	L1560354-12	L1560354-13	L1560354-14	L1560354-15
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	16-DEC-14	16-DEC-14	15-DEC-14	15-DEC-14	16-DEC-14
	Sampled Time	10:49	11:16			
	Client ID	BB02	BB03	DUP1	DUP2	DUP3
Grouping	**Analyte**					
SOIL						
Physical Tests	Moisture (%)	48.9	45.8	24.8	49.8	48.1
	pH (1:2 soil:water) (pH)	7.82	8.11	8.22	7.75	7.79
Particle Size	% Gravel (>2mm) (%)	1.87	1.91	0.43	1.01	1.40
	% Sand (2.00mm - 1.00mm) (%)	0.60	4.38	0.69	0.27	0.90
	% Sand (1.00mm - 0.50mm) (%)	0.96	3.60	2.84	0.62	0.78
	% Sand (0.50mm - 0.25mm) (%)	1.12	4.73	22.8	1.44	0.62
	% Sand (0.25mm - 0.125mm) (%)	1.79	3.66	56.6	3.01	1.18
	% Sand (0.125mm - 0.063mm) (%)	3.21	3.99	10.3	4.68	3.87
	% Silt (0.063mm - 0.0312mm) (%)	15.9	10.7	3.18	16.1	16.5
	% Silt (0.0312mm - 0.004mm) (%)	45.2	37.2	1.67	43.7	46.7
	% Clay (<4um) (%)	29.4	29.8	1.47	29.2	28.0
	Texture	Silt loam	Silt loam	Sand	Silt loam	Silt loam
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.45	1.60	0.42	1.95	1.52
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	14200	10500	4200	12300	12200
	% Saturation (%)	69.6	65.9	30.4	80.2	76.2
	Sodium (Na) (mg/kg)	6880	5750	2250	6570	6750
Metals	Aluminum (Al) (mg/kg)	23300	18200	4780	21100	22600
	Antimony (Sb) (mg/kg)	0.74	0.64	<0.10	0.97	0.77
	Arsenic (As) (mg/kg)	9.47	8.58	2.08	9.83	9.36
	Barium (Ba) (mg/kg)	102	80.5	54.2	91.7	91.6
	Beryllium (Be) (mg/kg)	0.48	0.36	<0.20	0.40	0.41
	Bismuth (Bi) (mg/kg)	<0.20	<0.20	<0.20	0.21	<0.20
	Cadmium (Cd) (mg/kg)	0.164	0.134	0.068	0.200	0.161
	Calcium (Ca) (mg/kg)	13200	76000	2460	9200	12300
	Chromium (Cr) (mg/kg)	32.4	25.9	7.77	31.5	30.1
	Cobalt (Co) (mg/kg)	13.3	10.7	2.09	12.4	12.9
	Copper (Cu) (mg/kg)	39.5	32.0	2.13	44.1	38.2
	Iron (Fe) (mg/kg)	37800	31100	6870	36900	37200
	Lead (Pb) (mg/kg)	10.1	9.19	1.40	10.8	10.4
	Lithium (Li) (mg/kg)	25.9	19.3	5.5	23.7	25.4
	Magnesium (Mg) (mg/kg)	12100	11300	2860	11600	11600
	Manganese (Mn) (mg/kg)	541	493	86.7	501	516
	Mercury (Hg) (mg/kg)	0.0650	0.0576	0.0070	0.0778	0.0649
	Molybdenum (Mo) (mg/kg)	1.22	0.87	0.69	2.21	1.40
	Nickel (Ni) (mg/kg)	29.2	23.6	4.31	28.5	29.2
	Phosphorus (P) (mg/kg)	1130	1150	576	1040	1100

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1560354-1	L1560354-2	L1560354-3	L1560354-4	L1560354-5
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	15-DEC-14	15-DEC-14	15-DEC-14	15-DEC-14	15-DEC-14
	Sampled Time	12:30	13:32	13:21	14:06	14:25
	Client ID	SM01	SM02	SM03	BA01	BA02
Grouping	**Analyte**					
SOIL						
Metals	Potassium (K) (mg/kg)	1230	1480	1970	2760	1630
	Selenium (Se) (mg/kg)	<0.20	<0.20	<0.20	0.40	0.27
	Silver (Ag) (mg/kg)	<0.10	<0.10	<0.10	0.14	<0.10
	Sodium (Na) (mg/kg)	3010	3500	5040	7760	6810
	Strontium (Sr) (mg/kg)	20.6	23.7	28.3	81.9	736
	Thallium (Tl) (mg/kg)	0.133	0.126	0.173	0.103	0.100
	Tin (Sn) (mg/kg)	<2.0	<2.0	<2.0	2.2	<2.0
	Titanium (Ti) (mg/kg)	381	395	501	700	360
	Uranium (U) (mg/kg)	0.456	0.467	0.696	1.04	0.591
	Vanadium (V) (mg/kg)	21.3	24.6	33.2	64.2	31.4
	Zinc (Zn) (mg/kg)	19.0	21.5	32.3	77.8	37.8
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Acenaphthylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benz(a)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(a)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(b)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chrysene (mg/kg)	<0.050	<0.050	<0.050	0.067	<0.050
	Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Fluorene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Naphthalene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Phenanthrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Surrogate: Acenaphthene d10 (%)	85.9	88.8	94.3	83.6	78.5
	Surrogate: Chrysene d12 (%)	114.9	107.1	114.4	88.9	102.5
	Surrogate: Naphthalene d8 (%)	85.5	88.2	85.6	80.1	76.8
	Surrogate: Phenanthrene d10 (%)	98.5	99.3	107.4	80.2	92.4
	Total PAHs (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1221 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1232 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1242 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1560354-6	L1560354-7	L1560354-8	L1560354-9	L1560354-10
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	15-DEC-14	15-DEC-14	15-DEC-14	16-DEC-14	16-DEC-14
	Sampled Time	14:46	15:04	15:29	10:01	10:24
	Client ID	BA03	BA04	BA05	BA06	BB01
Grouping	**Analyte**					
SOIL						
Metals	Potassium (K) (mg/kg)	2790	3550	3060	3010	1950
	Selenium (Se) (mg/kg)	0.43	0.57	0.44	0.47	0.32
	Silver (Ag) (mg/kg)	0.14	0.23	0.16	0.18	<0.10
	Sodium (Na) (mg/kg)	8760	11400	9060	8270	8600
	Strontium (Sr) (mg/kg)	106	68.0	59.5	134	1070
	Thallium (Tl) (mg/kg)	0.108	0.110	0.114	0.109	0.076
	Tin (Sn) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Titanium (Ti) (mg/kg)	736	946	797	744	524
	Uranium (U) (mg/kg)	1.25	1.45	1.17	1.24	0.921
	Vanadium (V) (mg/kg)	67.5	85.0	67.8	66.6	42.7
	Zinc (Zn) (mg/kg)	81.7	106	81.8	85.0	52.9
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Acenaphthylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benz(a)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(a)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(b)fluoranthene (mg/kg)	<0.050	0.064	0.068	<0.050	<0.050
	Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chrysene (mg/kg)	<0.050	0.052	<0.050	<0.050	<0.050
	Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Fluoranthene (mg/kg)	<0.050	0.069	0.093	<0.050	<0.050
	Fluorene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Naphthalene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Phenanthrene (mg/kg)	<0.050	0.072	0.082	<0.050	<0.050
	Pyrene (mg/kg)	<0.050	0.058	0.083	<0.050	<0.050
	Surrogate: Acenaphthene d10 (%)	83.0	89.5	90.3	83.5	86.7
	Surrogate: Chrysene d12 (%)	102.4	114.3	113.3	105.5	112.9
	Surrogate: Naphthalene d8 (%)	79.5	83.1	85.5	81.3	84.9
	Surrogate: Phenanthrene d10 (%)	97.1	104.3	103.4	97.1	102.4
	Total PAHs (mg/kg)	<0.20	0.31	0.33	<0.20	<0.20
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1221 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1232 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1242 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1560354-11 Sediment 16-DEC-14 10:49 BB02	L1560354-12 Sediment 16-DEC-14 11:16 BB03	L1560354-13 Sediment 15-DEC-14 DUP1	L1560354-14 Sediment 15-DEC-14 DUP2	L1560354-15 Sediment 16-DEC-14 DUP3
SOIL						
Metals	Potassium (K) (mg/kg)	3550	2830	1230	3230	3300
	Selenium (Se) (mg/kg)	0.51	0.44	<0.20	0.57	0.51
	Silver (Ag) (mg/kg)	0.17	0.14	<0.10	0.21	0.18
	Sodium (Na) (mg/kg)	11400	10200	2910	11100	10400
	Strontium (Sr) (mg/kg)	80.2	383	16.3	70.6	75.6
	Thallium (Tl) (mg/kg)	0.112	0.092	0.133	0.110	0.104
	Tin (Sn) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Titanium (Ti) (mg/kg)	984	714	292	788	905
	Uranium (U) (mg/kg)	1.37	1.14	0.390	1.42	1.33
	Vanadium (V) (mg/kg)	84.8	67.8	20.2	80.8	78.7
	Zinc (Zn) (mg/kg)	102	93.9	19.2	101	98.9
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Acenaphthylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benz(a)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(a)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(b)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	0.052	<0.050
	Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chrysene (mg/kg)	<0.050	<0.050	<0.050	0.080	<0.050
	Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Fluoranthene (mg/kg)	<0.050	<0.050	<0.050	0.093	<0.050
	Fluorene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Naphthalene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Phenanthrene (mg/kg)	<0.050	<0.050	<0.050	0.063	<0.050
	Pyrene (mg/kg)	<0.050	<0.050	<0.050	0.068	<0.050
	Surrogate: Acenaphthene d10 (%)	84.7	80.2	85.7	96.5	63.8
	Surrogate: Chrysene d12 (%)	110.9	103.7	106.7	96.1	73.1
	Surrogate: Naphthalene d8 (%)	82.3	78.2	85.2	91.3	72.4
	Surrogate: Phenanthrene d10 (%)	100.8	95.4	97.2	84.7	83.8
	Total PAHs (mg/kg)	<0.20	<0.20	<0.20	0.36	<0.20
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1221 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1232 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1242 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1560354-1	L1560354-2	L1560354-3	L1560354-4	L1560354-5
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	15-DEC-14	15-DEC-14	15-DEC-14	15-DEC-14	15-DEC-14
	Sampled Time	12:30	13:32	13:21	14:06	14:25
	Client ID	SM01	SM02	SM03	BA01	BA02
Grouping	**Analyte**					
SOIL						
Polychlorinated Biphenyls	PCB-1248 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1254 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1260 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1262 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1268 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Total PCB (BC CSR) (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Total Polychlorinated Biphenyls (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
Dioxins and Furans	2,3,7,8-TCDD (pg/g)	<0.14 [U]	<0.10 [U]	<0.11 [U]	<0.17 [U]	<0.098 [U]
	1,2,3,7,8-PeCDD (pg/g)	<0.11 [U]	<0.11 [U]	0.27 [J]	<0.15 [U]	0.43 J,R
	1,2,3,4,7,8-HxCDD (pg/g)	<0.11 [U]	0.078 J,R	<0.071 [U]	<0.034 [U]	<0.040 [U]
	1,2,3,6,7,8-HxCDD (pg/g)	0.420 J,R	0.380 [J]	0.600 J,R	4.23	1.20 J,R
	1,2,3,7,8,9-HxCDD (pg/g)	0.40 [J]	0.140 J,R	0.250 J,R	2.24 [J]	0.900 [J]
	1,2,3,4,6,7,8-HpCDD (pg/g)	0.440 J,R	0.600 J,R	2.40 J,R	11.0 R	7.04
	OCDD (pg/g)	2.60 J,R	2.70 J,R	12.0 R	67.9	46.1
	Total-TCDD (pg/g)	<0.14 [U]	<0.10 [U]	<0.11 [U]	<0.17 [U]	<0.098 [U]
	Total TCDD # Homologues	0	0	0	0	0
	Total-PeCDD (pg/g)	<0.11 [U]	<0.11 [U]	0.27	0.52	0.40
	Total PeCDD # Homologues	0	0	1	1	1
	Total-HxCDD (pg/g)	2.18	0.505	<0.071 [U]	31.5	8.57
	Total HxCDD # Homologues	2	2	0	4	3
	Total-HpCDD (pg/g)	1.13	<0.043 [U]	5.54	18.2	7.04
	Total HpCDD # Homologues	1	0	1	1	1
	2,3,7,8-TCDF (pg/g)	0.63 J,R	0.633 [J]	1.20	8.28	2.04
	1,2,3,7,8-PeCDF (pg/g)	0.111 [J]	0.093 J,R	<0.067 [U]	<0.13 [U]	0.219 [J]
	2,3,4,7,8-PeCDF (pg/g)	<0.076 [U]	0.110 J,R	<0.057 [U]	0.29 [J]	0.130 J,R
	1,2,3,4,7,8-HxCDF (pg/g)	<0.075 [U]	<0.049 [U]	<0.069 [U]	0.31 J,R	0.210 J,R
	1,2,3,6,7,8-HxCDF (pg/g)	0.082 J,R	<0.048 [U]	<0.063 [U]	<0.10 [U]	<0.073 [U]
	1,2,3,7,8,9-HxCDF (pg/g)	0.096 M,J,R	0.074 J,R	<0.084 [U]	<0.12 [U]	<0.10 J,R
	2,3,4,6,7,8-HxCDF (pg/g)	<0.064 [U]	0.230 J,R	<0.066 [U]	0.150 J,R	0.310 J,R
	1,2,3,4,6,7,8-HpCDF (pg/g)	0.180 J,R	0.250 J,R	0.402 [J]	2.26 [J]	1.40 [J]
	1,2,3,4,7,8,9-HpCDF (pg/g)	<0.039 [U]	0.230 J,R	0.075 J,R	<0.14 [U]	<0.053 [U]
	OCDF (pg/g)	0.710 J,R	0.800 J,R	1.30 J,R	8.12 [J]	3.27 J,B
	Total-TCDF (pg/g)	<0.14 [U]	1.01	1.68	10.5	3.41
	Total TCDF # Homologues	0	2	2	5	3
	Total-PeCDF (pg/g)	0.111	<0.066 [U]	<0.067 [U]	0.29	0.219
	Total PeCDF # Homologues	1	0	0	1	1

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1560354-6	L1560354-7	L1560354-8	L1560354-9	L1560354-10
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	15-DEC-14	15-DEC-14	15-DEC-14	16-DEC-14	16-DEC-14
	Sampled Time	14:46	15:04	15:29	10:01	10:24
	Client ID	BA03	BA04	BA05	BA06	BB01
Grouping	**Analyte**					
SOIL						
Polychlorinated Biphenyls	PCB-1248 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1254 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1260 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1262 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1268 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Total PCB (BC CSR) (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Total Polychlorinated Biphenyls (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
Dioxins and Furans	2,3,7,8-TCDD (pg/g)	0.22 M,J,R	0.40 M,J,R	0.25 [J]	0.28 M,J,R	<0.099 [U]
	1,2,3,7,8-PeCDD (pg/g)	0.860 J,R	0.656 [J]	0.330 M,J,R	0.573 [J]	0.365 [J]
	1,2,3,4,7,8-HxCDD (pg/g)	0.210 M,J,R	0.370 J,R	0.23 J,R	<0.23 [U]	<0.040 [U]
	1,2,3,6,7,8-HxCDD (pg/g)	5.00 R	8.97	5.01	4.40 M,R	2.01 [J]
	1,2,3,7,8,9-HxCDD (pg/g)	1.40 J,R	3.70 M,J,R	1.50 J,R	1.90 J,R	1.15 [J]
	1,2,3,4,6,7,8-HpCDD (pg/g)	12.0 R	20.4	15.6	12.9	4.72
	OCDD (pg/g)	72.3	108	67.5	64.5	25.1
	Total-TCDD (pg/g)	0.45	<0.15 [U]	0.25	<0.10 [U]	<0.099 [U]
	Total TCDD # Homologues	1	0	1	0	0
	Total-PeCDD (pg/g)	0.787	2.15	0.312	1.73	0.730
	Total PeCDD # Homologues	1	4	1	3	3
	Total-HxCDD (pg/g)	26.1	70.7	10.8	26.6	17.6
	Total HxCDD # Homologues	2	3	2	2	4
	Total-HpCDD (pg/g)	17.5	49.6	36.7	12.9	10.3
	Total HpCDD # Homologues	1	2	2	1	2
	2,3,7,8-TCDF (pg/g)	9.77	16.2	9.43	10.8 M	4.34
	1,2,3,7,8-PeCDF (pg/g)	0.120 J,R	0.34 J,R	0.250 J,R	0.240 J,R	<0.087 [U]
	2,3,4,7,8-PeCDF (pg/g)	0.277 [J]	0.72 J,R	0.400 J,R	0.446 [J]	<0.072 [U]
	1,2,3,4,7,8-HxCDF (pg/g)	0.200 J,R	0.190 J,R	0.271 [J]	0.182 [J]	<0.022 [U]
	1,2,3,6,7,8-HxCDF (pg/g)	0.120 J,R	<0.025 [U]	0.100 J,R	0.090 J,R	<0.022 [U]
	1,2,3,7,8,9-HxCDF (pg/g)	0.240 J,R	0.130 J,R	<0.037 [U]	0.100 J,R	<0.032 [U]
	2,3,4,6,7,8-HxCDF (pg/g)	0.200 J,R	1.96 [J]	0.876 [J]	0.620 J,R	0.120 J,R
	1,2,3,4,6,7,8-HpCDF (pg/g)	3.16 [J]	4.47 [J]	2.20 J,R	3.59 [J]	0.89 J,R
	1,2,3,4,7,8,9-HpCDF (pg/g)	<0.050 [U]	<0.067 [U]	<0.056 [U]	<0.077 [U]	0.22 J,R
	OCDF (pg/g)	8.42 J,B	12.6	7.69 J,B	7.50 J,R	1.80 J,R
	Total-TCDF (pg/g)	17.1	26.9	11.1	19.5	6.69
	Total TCDF # Homologues	6	5	3	6	3
	Total-PeCDF (pg/g)	0.745	1.23	1.50	1.74	0.362
	Total PeCDF # Homologues	4	1	2	3	2

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1560354-11 Sediment 16-DEC-14 10:49 BB02	L1560354-12 Sediment 16-DEC-14 11:16 BB03	L1560354-13 Sediment 15-DEC-14 DUP1	L1560354-14 Sediment 15-DEC-14 DUP2	L1560354-15 Sediment 16-DEC-14 DUP3
SOIL						
Polychlorinated Biphenyls	PCB-1248 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1254 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1260 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1262 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1268 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Total PCB (BC CSR) (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Total Polychlorinated Biphenyls (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
Dioxins and Furans	2,3,7,8-TCDD (pg/g)	0.15 J,R	0.27 J,R	<0.040 [U]	0.150 J,R	0.250 J,R
	1,2,3,7,8-PeCDD (pg/g)	<0.15 M,U	0.95 J,R	<0.095 [U]	<0.076 [U]	0.840 J,R
	1,2,3,4,7,8-HxCDD (pg/g)	<0.068 [U]	<0.13 [U]	<0.049 [U]	0.160 J,R	<0.047 [U]
	1,2,3,6,7,8-HxCDD (pg/g)	6.03	5.14	0.190 J,R	8.99	4.68
	1,2,3,7,8,9-HxCDD (pg/g)	1.60 J,R	2.10 J,R	0.140 J,R	2.98 M,J	1.97 [J]
	1,2,3,4,6,7,8-HpCDD (pg/g)	11.0	9.57	0.68 J,R	17.2	10.8
	OCDD (pg/g)	66.0 R	52.2	2.70 J,R	84.0 R	47.6
	Total-TCDD (pg/g)	0.41	0.38	<0.040 [U]	<0.084 [U]	<0.094 [U]
	Total TCDD # Homologues	1	1	0	0	0
	Total-PeCDD (pg/g)	1.45	0.33	<0.095 [U]	5.27	1.11
	Total PeCDD # Homologues	2	1	0	5	2
	Total-HxCDD (pg/g)	36.1	37.1	1.71	68.8	33.9
	Total HxCDD # Homologues	2	3	1	6	4
	Total-HpCDD (pg/g)	26.5	23.4	<0.12 [U]	42.8	23.0
	Total HpCDD # Homologues	2	2	0	2	2
	2,3,7,8-TCDF (pg/g)	9.83 M	10.6	0.500 J,R	14.0	9.81 M
	1,2,3,7,8-PeCDF (pg/g)	0.240 J,R	0.16 J,R	<0.022 [U]	0.230 J,R	<0.023 [U]
	2,3,4,7,8-PeCDF (pg/g)	0.300 J,R	0.340 J,R	<0.019 [U]	0.370 M,J,R	0.210 J,R
	1,2,3,4,7,8-HxCDF (pg/g)	0.110 J,R	<0.079 [U]	<0.059 [U]	0.110 J,R	0.070 J,R
	1,2,3,6,7,8-HxCDF (pg/g)	0.120 J,R	0.220 J,R	<0.056 [U]	0.061 J,R	<0.025 [U]
	1,2,3,7,8,9-HxCDF (pg/g)	<0.13 [U]	<0.11 [U]	<0.083 [U]	<0.072 [U]	<0.036 [U]
	2,3,4,6,7,8-HxCDF (pg/g)	0.222 [J]	0.092 J,R	<0.059 [U]	0.240 J,R	0.240 J,R
	1,2,3,4,6,7,8-HpCDF (pg/g)	1.60 J,R	1.70 J,R	0.170 J,R	3.40 J,R	2.10 J,R
	1,2,3,4,7,8,9-HpCDF (pg/g)	<0.14 [U]	<0.080 [U]	<0.057 [U]	<0.060 [U]	<0.054 [U]
	OCDF (pg/g)	6.00 J,R	4.60 J,R	0.40 J,B	7.76 J,B	5.80 J,B
	Total-TCDF (pg/g)	17.0	16.6	<0.074 [U]	25.8	13.5
	Total TCDF # Homologues	6	4	0	7	6
	Total-PeCDF (pg/g)	0.396	1.00	<0.022 [U]	0.140	0.470
	Total PeCDF # Homologues	2	2	0	1	1

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1560354-1	L1560354-2	L1560354-3	L1560354-4	L1560354-5
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	15-DEC-14	15-DEC-14	15-DEC-14	15-DEC-14	15-DEC-14
	Sampled Time	12:30	13:32	13:21	14:06	14:25
	Client ID	SM01	SM02	SM03	BA01	BA02
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total-HxCDF (pg/g)	0.182	<0.058 [U]	<0.084 [U]	<0.12 [U]	0.21
	Total HxCDF # Homologues	1	0	0	0	1
	Total-HpCDF (pg/g)	<0.039 [U]	<0.072 [U]	0.402	2.26	1.40
	Total HpCDF # Homologues	0	0	1	1	1
	Surrogate: 13C12-2,3,7,8-TCDD (%)	77.0	81.0	80.0	81.0	75.0
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)	62.0	71.0	70.0	72.0	63.0
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)	101.0	92.0	98.0	106.0	98.0
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)	99.0	102.0	107.0	105.0	95.0
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)	89.0	86.0	92.0	85.0	65.0
	Surrogate: 13C12-OCDD (%)	65.0	66.0	76.0	64.0	46.0
	Surrogate: 13C12-2,3,7,8-TCDF (%)	87.0	89.0	90.0	92.0	85.0
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)	72.0	81.0	80.0	80.0	74.0
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)	79.0	83.0	84.0	91.0	75.0
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)	101.0	103.0	114.0	110.0	103.0
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)	102.0	101.0	114.0	107.0	104.0
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)	112.0	107.0	119.0	115.0	104.0
	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)	107.0	102.0	114.0	111.0	90.0
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)	107.0	109.0	121.0	110.0	94.0
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)	94.0	96.0	104.0	92.0	73.0
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)	79.0	88.0	81.0	90.0	80.0
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.0437	0.101	0.397	1.61	0.400
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)	0.323	0.311	0.593	1.94	1.11
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.472	0.421	0.675	2.11	1.16

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1560354-6	L1560354-7	L1560354-8	L1560354-9	L1560354-10
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	15-DEC-14	15-DEC-14	15-DEC-14	16-DEC-14	16-DEC-14
	Sampled Time	14:46	15:04	15:29	10:01	10:24
	Client ID	BA03	BA04	BA05	BA06	BB01
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total-HxCDF (pg/g)	1.99	7.85	3.00	2.50	<0.032 [U]
	Total HxCDF # Homologues	1	4	3	3	0
	Total-HpCDF (pg/g)	3.16	13.0	<0.056 [U]	10.1	<0.19 [U]
	Total HpCDF # Homologues	1	2	0	2	0
	Surrogate: 13C12-2,3,7,8-TCDD (%)	80.0	81.0	77.0	72.0	75.0
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)	68.0	75.0	73.0	66.0	65.0
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)	108.0	103.0	96.0	102.0	99.0
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)	108.0	104.0	105.0	101.0	100.0
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)	87.0	76.0	73.0	79.0	78.0
	Surrogate: 13C12-OCDD (%)	62.0	47.0	48.0	63.0	61.0
	Surrogate: 13C12-2,3,7,8-TCDF (%)	89.0	88.0	89.0	81.0	82.0
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)	81.0	83.0	83.0	74.0	76.0
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)	82.0	90.0	88.0	79.0	80.0
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)	118.0	115.0	110.0	106.0	105.0
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)	118.0	117.0	105.0	105.0	105.0
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)	111.0	116.0	114.0	103.0	103.0
	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)	106.0	94.0	93.0	93.0	94.0
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)	111.0	100.0	94.0	97.0	95.0
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)	94.0	79.0	77.0	78.0	83.0
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)	89.0	82.0	79.0	77.0	84.0
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)	1.12	3.65	1.99	1.99	1.17
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)	3.06	4.72	2.65	3.00	1.26
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)	3.06	4.72	2.65	3.01	1.33

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1560354-11	L1560354-12	L1560354-13	L1560354-14	L1560354-15
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	16-DEC-14	16-DEC-14	15-DEC-14	15-DEC-14	16-DEC-14
	Sampled Time	10:49	11:16			
	Client ID	BB02	BB03	DUP1	DUP2	DUP3
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total-HxCDF (pg/g)	1.84	3.54	<0.083 [U]	2.34	<0.036 [U]
	Total HxCDF # Homologues	2	3	0	1	0
	Total-HpCDF (pg/g)	<0.14 [U]	<0.080 [U]	<0.057 [U]	6.98	4.05
	Total HpCDF # Homologues	0	0	0	1	1
	Surrogate: 13C12-2,3,7,8-TCDD (%)	73.0	79.0	71.0	74.0	75.0
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)	64.0	70.0	57.0	61.0	66.0
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)	94.0	103.0	94.0	101.0	100.0
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)	100.0	101.0	96.0	98.0	110.0
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)	78.0	84.0	78.0	74.0	83.0
	Surrogate: 13C12-OCDD (%)	52.0	65.0	59.0	56.0	63.0
	Surrogate: 13C12-2,3,7,8-TCDF (%)	81.0	86.0	80.0	82.0	81.0
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)	73.0	80.0	70.0	73.0	77.0
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)	77.0	83.0	70.0	75.0	78.0
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)	108.0	112.0	107.0	106.0	114.0
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)	109.0	117.0	104.0	110.0	119.0
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)	107.0	106.0	105.0	104.0	107.0
	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)	94.0	98.0	92.0	92.0	104.0
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)	97.0	103.0	92.0	98.0	102.0
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)	81.0	90.0	81.0	83.0	91.0
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)	85.0	87.0	77.0	99.0	86.0
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)	1.72	1.69	0.000120	2.77	1.77
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)	2.27	3.29	0.179	3.20	2.98
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)	2.36	3.30	0.265	3.24	2.99

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Uranium (U)	DUP-H	L1560354-15
Duplicate	1,2,3,4,6,7,8-HpCDF	G	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Duplicate	1,2,3,4,7,8-HxCDF	G	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Duplicate	1,2,3,7,8,9-HxCDD	G	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Duplicate	1,2,3,7,8-PeCDD	G	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Duplicate	1,2,3,7,8-PeCDF	G	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Duplicate	2,3,4,6,7,8-HxCDF	G	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Duplicate	Total-HpCDD	G	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Duplicate	OCDF	J,B	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Duplicate	Total-PeCDD	J,G	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Method Blank	1,2,3,4,6,7,8-HpCDD	J,R	L1560354-1, -2, -3, -4
Method Blank	1,2,3,4,7,8,9-HpCDF	J,R	L1560354-1, -2, -3, -4
Method Blank	2,3,4,6,7,8-HxCDF	J,R	L1560354-1, -2, -3, -4
Method Blank	OCDD	J,R	L1560354-1, -2, -3, -4
Method Blank	OCDF	J,R	L1560354-1, -2, -3, -4
Duplicate	1,2,3,4,6,7,8-HpCDF	J,R	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Duplicate	1,2,3,7,8,9-HxCDD	J,R	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Method Blank	1,2,3,4,6,7,8-HpCDD	J,R	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Method Blank	OCDD	J,R	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Duplicate	1,2,3,4,6,7,8-HpCDD	R	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Duplicate	1,2,3,6,7,8-HxCDD	[J]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Method Blank	OCDF	[J]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Method Blank	1,2,3,4,6,7,8-HpCDF	[U]	L1560354-1, -2, -3, -4
Method Blank	1,2,3,4,7,8-HxCDD	[U]	L1560354-1, -2, -3, -4
Method Blank	1,2,3,4,7,8-HxCDF	[U]	L1560354-1, -2, -3, -4
Method Blank	1,2,3,6,7,8-HxCDD	[U]	L1560354-1, -2, -3, -4
Method Blank	1,2,3,6,7,8-HxCDF	[U]	L1560354-1, -2, -3, -4
Method Blank	1,2,3,7,8,9-HxCDD	[U]	L1560354-1, -2, -3, -4
Method Blank	1,2,3,7,8,9-HxCDF	[U]	L1560354-1, -2, -3, -4
Method Blank	1,2,3,7,8-PeCDD	[U]	L1560354-1, -2, -3, -4
Method Blank	1,2,3,7,8-PeCDF	[U]	L1560354-1, -2, -3, -4
Method Blank	2,3,4,7,8-PeCDF	[U]	L1560354-1, -2, -3, -4

Reference Information

	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	2,3,7,8-TCDD	[U]	L1560354-1, -2, -3, -4
Method Blank	2,3,7,8-TCDF	[U]	L1560354-1, -2, -3, -4
Method Blank	Total-HpCDD	[U]	L1560354-1, -2, -3, -4
Method Blank	Total-HpCDF	[U]	L1560354-1, -2, -3, -4
Method Blank	Total-HxCDD	[U]	L1560354-1, -2, -3, -4
Method Blank	Total-HxCDF	[U]	L1560354-1, -2, -3, -4
Method Blank	Total-PeCDD	[U]	L1560354-1, -2, -3, -4
Method Blank	Total-PeCDF	[U]	L1560354-1, -2, -3, -4
Method Blank	Total-TCDD	[U]	L1560354-1, -2, -3, -4
Method Blank	Total-TCDF	[U]	L1560354-1, -2, -3, -4
Duplicate	1,2,3,4,7,8,9-HpCDF	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Duplicate	1,2,3,4,7,8-HxCDD	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Duplicate	1,2,3,4,7,8-HxCDF	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Duplicate	1,2,3,6,7,8-HxCDF	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Duplicate	1,2,3,7,8,9-HxCDF	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Duplicate	1,2,3,7,8-PeCDD	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Duplicate	1,2,3,7,8-PeCDF	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Duplicate	2,3,4,6,7,8-HxCDF	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Duplicate	2,3,4,7,8-PeCDF	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Duplicate	2,3,7,8-TCDD	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Duplicate	Total-TCDD	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Comments:	Differences present between sample and duplicate. Levels present are below lowest calibration level and therefore are in method control.		
Method Blank	1,2,3,4,6,7,8-HpCDF	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Method Blank	1,2,3,4,7,8,9-HpCDF	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Method Blank	1,2,3,4,7,8-HxCDD	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Method Blank	1,2,3,4,7,8-HxCDF	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Method Blank	1,2,3,6,7,8-HxCDD	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Method Blank	1,2,3,6,7,8-HxCDF	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Method Blank	1,2,3,7,8,9-HxCDD	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Method Blank	1,2,3,7,8,9-HxCDF	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Method Blank	1,2,3,7,8-PeCDD	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Method Blank	1,2,3,7,8-PeCDF	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Method Blank	2,3,4,6,7,8-HxCDF	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Method Blank	2,3,4,7,8-PeCDF	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Method Blank	2,3,7,8-TCDD	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Method Blank	2,3,7,8-TCDF	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9

Reference Information

	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Total-HpCDD	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Method Blank	Total-HpCDF	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Method Blank	Total-HxCDD	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Method Blank	Total-HxCDF	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Method Blank	Total-PeCDD	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Method Blank	Total-PeCDF	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Method Blank	Total-TCDD	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9
Method Blank	Total-TCDF	[U]	L1560354-10, -11, -12, -13, -14, -15, -5, -6, -7, -8, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
G	QC result did not meet ALS DQO. Refer to narrative comments for further information.
J,B	The analyte was detected below the calibrated range but above the EDL, and was detected in the Method Blank at >10% of the sample concentration.
J,G	QC result did not meet ALS DQO. Refer to narrative comments for further information. Duplicate expressed in terms of absolute difference.
J,R	The analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M	A peak has been manually integrated.
M,J	A peak has been manually integrated, and the analyte was detected below the calibrated range but above the EDL.
M,J,R	A peak has been manually integrated, the analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,R	A peak has been manually integrated, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,U	A peak has been manually integrated, and the analyte was not detected above the EDL.
R	The ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
[J]	The analyte was detected below the calibrated range but above the EDL.
[U]	The analyte was not detected above the EDL.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-TOT-ORG-LECO-SK	Soil	Organic Carbon by combustion method	SSSA (1996) p. 973

Total Organic Carbon (C-TOT-ORG-LECO-SK, C-TOT-ORG-SK)

Total C and inorganic C are determined on separate samples. The total C is determined by combustion and thermal conductivity detection, while inorganic C is determined by weight lass after addition of hydrochloric acid. Organic C is calculated by the difference between these two determinations.

Reference for Total C:
Nelson, D.W. and Sommers, L.E. 1996. Total Carbon, organic carbon and organic matter. P. 961-1010 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

Reference for Inorganic C:
Loeppert, R.H. and Suarez, D.L. 1996. Gravimetric Method for Loss of Carbon Dioxide. P. 455-456 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

CL-PASTE-COLOR-VA	Soil	Chloride in Soil (Paste) by Colourimetry	Carter-CSSS / APHA 4500-Cl E (modified)

A soil extract produced by the saturated paste extraction procedure is analyzed for chloride by ferricyanide colourimetry.

DX-1613B-HRMS-BU	Soil	Dioxins and Furans HR 1613B	USEPA 1613B

Samples are extracted by Soxhlet. The extracts are prepared using column chromatography, reduced in volume and analyzed by isotope-dilution GC/HRMS

HG-200.2-CVAF-VA	Soil	Mercury in Soil by CVAFS	EPA 200.2/1631E (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAFS.

MET-200.2-CCMS-VA	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)

Reference Information

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample matrix, for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V.

MET-PASTE-ICP-VA Soil Metals in Soil (Paste) by ICPOES Carter-CSSS / EPA 6010B (modified)

A soil extract produced by the saturated paste extraction procedure is analyzed for Sodium, Calcium, and Magnesium by ICPOES as per "Soil Sampling and Methods of Analysis" by M. Carter.

MOISTURE-VA Soil Moisture content ASTM D2974-00 Method A

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

PAH-SUM-CALC-VA Soil Sum of PAH's CALCULATION

Total PAH represents the sum of all PAH analytes reported for a given sample. Note that regulatory agencies and criteria differ in their definitions of Total PAH in terms of the individual PAH analytes to be included.

PAH-TMB-H/A-MS-VA Soil PAH - Rotary Extraction (Hexane/Acetone) EPA 3570/8270

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3570 & 8270, published by the United States Environmental Protection Agency (EPA). The procedure uses a mechanical shaking technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene. The final extract is analysed by capillary column gas chromatography with mass spectrometric detection (GC/MS). Surrogate recoveries may not be reported in cases where interferences from the sample matrix prevent accurate quantitation. Because the two isomers cannot be readily chromatographically separated, benzo(j)fluoranthene is reported as part of the benzo(b)fluoranthene parameter.

PCB-CSR-SUM-CALC-VA Soil Total PCB (BC CSR) in soil BC Contaminated Sites Regulation

Calculation of Total PCB to meet BC Contaminated Sites Regulation. Total PCB (BC CSR) is the sum of the concentrations of PCB aroclors 1242, 1248, 1254 and 1260. Results below detection limit (DL) are treated as zero. The Total PCB detection limit is equal to the highest of the aroclor detection limits used in the sum.

PCB-SE-ECD-VA Soil PCB by Extraction with GCECD EPA8082, 3630

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3500, 3620, 3630, 3660, 3665 & 8082, published by the United States Environmental Protection Agency (EPA). The procedure involves a solid-liquid extraction of a subsample of the sediment/soil using a mixture of hexane and acetone. Water is added to the extract and the resulting hexane extract undergoes one or more of the following clean-up procedures (if required): florisil clean-up, silica gel clean-up, sulphur clean-up and/or sulphuric acid clean-up. The final extract is analysed by capillary column gas chromatography with electron capture detection (GC/ECD).

PCB-SUM-CALC-VA Soil Total PCBs in soil CALCULATION

Calculation of Total PCB. Total PCB is the sum of the concentrations of PCB aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, and 1268. Results below detection limit (DL) are treated as zero. The Total PCB detection limit is equal to the highest of the aroclor detection limits used in the sum.

PH-1:2-VA Soil pH in Soil (1:2 Soil:Water Extraction) BC WLAP METHOD: PH, ELECTROMETRIC, SOIL

This analysis is carried out in accordance with procedures described in the pH, Electrometric in Soil and Sediment method - Section B Physical/Inorganic and Misc. Constituents, BC Environmental Laboratory Manual 2007. The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water. The pH of the solution is then measured using a standard pH probe.

PSA-PIPET-DETAIL-SK Soil Particle size - Sieve and Pipette SSIR-51 METHOD 3.2.1

Particle size distribution is determined by a combination of techniques. Dry sieving is performed for coarse particles, wet sieving for sand particles and the pipette sedimentation method for clay particles.

Reference:

Burt, R. (2009). Soil Survey Field and Laboratory Methods Manual. Soil Survey Investigations Report No. 5. Method 3.2.1.2.2. United States Department of Agriculture Natural Resources Conservation Service.

SAT-PCNT-VA Soil Saturation Percentage Carter-CSSS

Saturation Percentage (SP) is the total volume of water present in a saturated paste (in mL) divided by the dry weight of the sample (in grams), expressed as a percentage, as described in "Soil Sampling and Methods of Analysis" by M. Carter.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location

Reference Information

SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA
BU	ALS ENVIRONMENTAL - BURLINGTON, ONTARIO, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

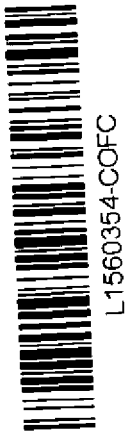
Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # N/A

Page 1 of 1

Report To		**Report Format / Distribution**	**Service Requested** (Rush for routine analysis subject to availability)
Company:	Stantec Consulting Ltd.	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Molly Brewis	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400A - 2261 Keating Cross Road	Email 1: molly.brewis@stantec.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saanichton, BC V8M 2A5	Email 2: karen.munro@stantec.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-858-9969 Fax: 250-544-1105	Email 3: stefan.dick@stantec.com	
Invoice To	Same as Report ? ☑ Yes ☐ No	**Client / Project Information**	**Analysis Request**
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 123220054 task 225.101	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #: Q42205	
Lab Work Order # (lab use only)		**ALS Contact:** Brent Mack	**Sampler:** MB & VG

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-CCME+FULL-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU		Archive			Number of Containers
	SM01	15-Dec-14	12:30	SEDIMENT	X	X	X	X	X	X	X	X					4
	SM02	15-Dec-14	13:32	SEDIMENT	X	X	X	X	X	X	X	X					4
	SM03	15-Dec-14	13:21	SEDIMENT	X	X	X	X	X	x	X	X					4
	BA01	15-Dec-14	14:06	SEDIMENT	X	X	X	X	X	X	X	X					4
	BA02	15-Dec-14	14:25	SEDIMENT	X	X	X	X	X	X	X	X					4
	BA03	15-Dec-14	14:46	SEDIMENT	X	X	X	X	X	X	X	X					4
	BA04	15-Dec-14	15:04	SEDIMENT	X	X	X	X	X	X	X	X					4
	BA05	15-Dec-14	15:29	SEDIMENT	X	X	X	X	X	X	X	X					4
	BA06	16-Dec-14	10:01	SEDIMENT	X	X	X	X	X	X	X	X					4
	BB01	16-Dec-14	10:24	SEDIMENT	X	X	X	X	X	X	X	X					4
	BB02	16-Dec-14	10:49	SEDIMENT	X	X	X	X	X	X	X	X					4
	BB03	16-Dec-14	11:16	SEDIMENT	X	X	X	X	X	X	X	X					4
	DUP1	15-Dec-14		SEDIMENT	X	X	X	X	X	X	X	X					3
	DUP2	15-Dec-14		SEDIMENT	X	X	X	X	X	X	X	X					3
	DUP3	16-Dec-14		SEDIMENT	X	X	X	X	X	X	X	X					3



Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Full metal scan, to meet CCME sediment quality guidelines. Detailed breakdown of particle size for clay and silt fractions. Remaining sample to be archived for 12 months in all cases.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Molly Brewis	17-Dec-14	8:00	[illegible]	Dec 18	12:15	20.00 °C				

Molly Brewis via Mr. Speedy-Delivery

GENF 18.01 Front

STANTEC CONSULTING LTD.
ATTN: Molly Brewis
4370 Dominion Street, 5th Floor
Burnaby BC V5G 4L7

Date Received: 22-DEC-14
Report Date: 28-JAN-15 14:36 (MT)
Version: FINAL

Client Phone: 604-436-3014

Certificate of Analysis

Lab Work Order #: L1561236

Project P.O. #: NOT SUBMITTED
Job Reference: 123220054 TASK 225.101
C of C Numbers:
Legal Site Desc:

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1561236-1 Sediment 18-DEC-14 10:52 PM01	L1561236-2 Sediment 18-DEC-14 11:11 PM02	L1561236-3 Sediment 18-DEC-14 11:48 PM03	L1561236-4 Sediment 18-DEC-14 DUP4	
Sample ID						
Description						
Sampled Date						
Sampled Time						
Client ID						
SOIL						
Physical Tests	Moisture (%)	20.2	46.8	44.2	49.5	
	pH (1:2 soil:water) (pH)	8.49	7.85	7.95	7.91	
Particle Size	% Gravel (>2mm) (%)	<0.10	0.50	<0.10	1.01	
	% Sand (2.00mm - 1.00mm) (%)	1.49	1.74	0.89	1.71	
	% Sand (1.00mm - 0.50mm) (%)	4.06	1.27	0.92	1.14	
	% Sand (0.50mm - 0.25mm) (%)	28.8	1.88	3.08	1.96	
	% Sand (0.25mm - 0.125mm) (%)	56.4	10.1	16.5	10.6	
	% Sand (0.125mm - 0.063mm) (%)	4.65	12.3	18.4	12.0	
	% Silt (0.063mm - 0.0312mm) (%)	1.85	16.0	14.5	14.9	
	% Silt (0.0312mm - 0.004mm) (%)	1.33	34.1	28.9	34.2	
	% Clay (<4um) (%)	1.43	22.1	16.7	22.4	
	Texture	Sand	Silt loam	Loam	Silt loam	
Organic / Inorganic Carbon	Total Organic Carbon (%)	0.48	4.11	2.30	4.38	
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	4300	12000	9010	11100	
	% Saturation (%)	25.1	62.9	53.9	69.6	
	Sodium (Na) (mg/kg)	2290	6240	4940	6130	
Metals	Aluminum (Al) (mg/kg)	5570	15600	14300	14900	
	Antimony (Sb) (mg/kg)	<0.10	0.81	0.59	0.82	
	Arsenic (As) (mg/kg)	2.07	8.73	7.34	9.28	
	Barium (Ba) (mg/kg)	93.4	91.6	88.3	89.1	
	Beryllium (Be) (mg/kg)	<0.20	0.32	0.27	0.32	
	Bismuth (Bi) (mg/kg)	<0.20	<0.20	<0.20	<0.20	
	Cadmium (Cd) (mg/kg)	<0.050	0.190	0.151	0.209	
	Calcium (Ca) (mg/kg)	11600	16300	7950	17200	
	Chromium (Cr) (mg/kg)	13.3	25.0	22.9	25.4	
	Cobalt (Co) (mg/kg)	2.20	9.05	8.03	8.84	
	Copper (Cu) (mg/kg)	2.79	36.0	32.3	35.6	
	Iron (Fe) (mg/kg)	9070	27400	23600	27300	
	Lead (Pb) (mg/kg)	2.01	11.2	8.89	14.9	
	Lithium (Li) (mg/kg)	5.4	18.5	16.2	18.2	
	Magnesium (Mg) (mg/kg)	3470	8760	8200	8930	
	Manganese (Mn) (mg/kg)	133	356	308	344	
	Mercury (Hg) (mg/kg)	<0.0050	0.0808	0.267	0.0736	
	Molybdenum (Mo) (mg/kg)	<0.50	1.92	1.76	2.10	
	Nickel (Ni) (mg/kg)	3.76	20.2	17.1	19.4	
	Phosphorus (P) (mg/kg)	680	889	958	959	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1561236-1	L1561236-2	L1561236-3	L1561236-4	
	Description	Sediment	Sediment	Sediment	Sediment	
	Sampled Date	18-DEC-14	18-DEC-14	18-DEC-14	18-DEC-14	
	Sampled Time	10:52	11:11	11:48		
	Client ID	PM01	PM02	PM03	DUP4	
Grouping	**Analyte**					
SOIL						
Metals	Potassium (K) (mg/kg)	2520	2990	2890	2890	
	Selenium (Se) (mg/kg)	<0.20	0.55	0.47	0.55	
	Silver (Ag) (mg/kg)	<0.10	0.17	0.14	0.17	
	Sodium (Na) (mg/kg)	1990	9120	7900	9900	
	Strontium (Sr) (mg/kg)	52.4	104	55.4	121	
	Thallium (Tl) (mg/kg)	0.087	0.120	0.142	0.124	
	Tin (Sn) (mg/kg)	<2.0	<2.0	<2.0	<2.0	
	Titanium (Ti) (mg/kg)	491	733	722	627	
	Uranium (U) (mg/kg)	0.349	1.28	1.21	1.37	
	Vanadium (V) (mg/kg)	31.6	63.3	58.1	62.6	
	Zinc (Zn) (mg/kg)	24.7	81.5	77.0	85.2	
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Acenaphthylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Anthracene (mg/kg)	<0.050	0.051	<0.050	<0.050	
	Benz(a)anthracene (mg/kg)	<0.050	0.081	<0.050	0.075	
	Benzo(a)pyrene (mg/kg)	<0.050	0.070	<0.050	0.083	
	Benzo(b)fluoranthene (mg/kg)	<0.050	0.121	0.088	0.150	
	Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050	<0.050	0.055	
	Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Chrysene (mg/kg)	<0.050	<0.20 DLM	<0.20 DLM	<0.20 DLM	
	Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Fluoranthene (mg/kg)	<0.050	0.162	0.098	0.181	
	Fluorene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050	<0.050	0.059	
	Naphthalene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Phenanthrene (mg/kg)	<0.050	0.164	0.057	0.133	
	Pyrene (mg/kg)	<0.050	0.160	0.078	0.159	
	Surrogate: Acenaphthene d10 (%)	82.4	93.7	85.9	84.0	
	Surrogate: Chrysene d12 (%)	111.3	129.5	114.6	114.2	
	Surrogate: Naphthalene d8 (%)	84.9	90.2	83.3	81.3	
	Surrogate: Phenanthrene d10 (%)	92.1	110.3	100.8	99.1	
	Total PAHs (mg/kg)	<0.20	0.81	0.32	0.90	
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1221 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1232 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1242 (mg/kg)	<0.020	<0.020	<0.020	<0.020	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1561236-1	L1561236-2	L1561236-3	L1561236-4	
	Description	Sediment	Sediment	Sediment	Sediment	
	Sampled Date	18-DEC-14	18-DEC-14	18-DEC-14	18-DEC-14	
	Sampled Time	10:52	11:11	11:48		
	Client ID	PM01	PM02	PM03	DUP4	
Grouping	**Analyte**					
SOIL						
Polychlorinated Biphenyls	PCB-1248 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1254 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1260 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1262 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1268 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	Total PCB (BC CSR) (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	Total Polychlorinated Biphenyls (mg/kg)	<0.020	<0.020	<0.020	<0.020	
Dioxins and Furans	2,3,7,8-TCDD (pg/g)	<0.048 [U]	0.364 [J]	0.257 [J]	0.48 [J]	
	1,2,3,7,8-PeCDD (pg/g)	0.137 [J]	1.27 [J]	<0.066 [U]	1.46 [J]	
	1,2,3,4,7,8-HxCDD (pg/g)	<0.042 [U]	<0.27 [U]	<0.25 [U]	<0.31 [U]	
	1,2,3,6,7,8-HxCDD (pg/g)	0.244 [J]	6.68	4.52	8.32	
	1,2,3,7,8,9-HxCDD (pg/g)	0.044 J,R	3.15 [J]	2.17 [J]	3.60 [J]	
	1,2,3,4,6,7,8-HpCDD (pg/g)	0.898 [J]	21.7	29.1	30.1	
	OCDD (pg/g)	4.37 [J]	133	253	191	
	Total-TCDD (pg/g)	<0.048 [U]	0.885	1.96	1.97	
	Total TCDD # Homologues	0	2	6	5	
	Total-PeCDD (pg/g)	0.179	4.62	3.72	4.66	
	Total PeCDD # Homologues	2	5	5	5	
	Total-HxCDD (pg/g)	1.60	51.9	36.9	61.4	
	Total HxCDD # Homologues	3	4	5	4	
	Total-HpCDD (pg/g)	1.91	57.4	66.9	70.1	
	Total HpCDD # Homologues	2	2	2	2	
	2,3,7,8-TCDF (pg/g)	0.430 [J]	11.0	8.23	13.7	
	1,2,3,7,8-PeCDF (pg/g)	<0.022 [U]	0.230 J,R	0.098 J,R	0.39 [J]	
	2,3,4,7,8-PeCDF (pg/g)	0.021 J,R	0.430 J,R	0.370 J,R	0.64 [J]	
	1,2,3,4,7,8-HxCDF (pg/g)	0.018 J,R	0.340 [J]	0.314 [J]	0.29 J,R	
	1,2,3,6,7,8-HxCDF (pg/g)	<0.013 [U]	0.140 J,R	0.190 [J]	0.30 [J]	
	1,2,3,7,8,9-HxCDF (pg/g)	<0.021 [U]	<0.13 [U]	<0.11 [U]	<0.23 [U]	
	2,3,4,6,7,8-HxCDF (pg/g)	0.029 J,R	0.673 [J]	0.420 J,R	0.66 [J]	
	1,2,3,4,6,7,8-HpCDF (pg/g)	0.200 J,R	4.86	6.77	5.83	
	1,2,3,4,7,8,9-HpCDF (pg/g)	<0.055 [U]	<0.31 [U]	<0.55 [U]	<0.48 [U]	
	OCDF (pg/g)	0.494 [J]	14.9	41.0	19.0	
	Total-TCDF (pg/g)	0.430	20.0	17.4	26.8	
	Total TCDF # Homologues	1	8	10	11	
	Total-PeCDF (pg/g)	<0.022 [U]	3.58	2.55	4.70	
	Total PeCDF # Homologues	0	6	5	8	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1561236-1	L1561236-2	L1561236-3	L1561236-4	
	Description	Sediment	Sediment	Sediment	Sediment	
	Sampled Date	18-DEC-14	18-DEC-14	18-DEC-14	18-DEC-14	
	Sampled Time	10:52	11:11	11:48		
	Client ID	PM01	PM02	PM03	DUP4	
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total-HxCDF (pg/g)	0.161	6.92	9.32	8.90	
	Total HxCDF # Homologues	1	5	6	5	
	Total-HpCDF (pg/g)	<0.055 [U]	15.8	29.9	19.5	
	Total HpCDF # Homologues	0	2	2	2	
	Surrogate: 13C12-2,3,7,8-TCDD (%)	66.0	74.0	78.0	76.0	
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)	55.0	56.0	49.0	79.0	
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)	82.0	90.0	80.0	97.0	
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)	104.0	104.0	101.0	101.0	
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)	70.0	72.0	64.0	75.0	
	Surrogate: 13C12-OCDD (%)	56.0	55.0	42.0	49.0	
	Surrogate: 13C12-2,3,7,8-TCDF (%)	78.0	89.0	96.0	83.0	
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)	71.0	74.0	68.0	87.0	
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)	71.0	72.0	63.0	94.0	
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)	99.0	108.0	100.0	107.0	
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)	113.0	119.0	119.0	109.0	
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)	104.0	108.0	100.0	103.0	
	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)	95.0	96.0	97.0	93.0	
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)	91.0	98.0	85.0	94.0	
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)	78.0	80.0	69.0	80.0	
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)	70.0	84.0	80.0	79.0	
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.215	4.13	2.25	5.22	
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)	0.261	4.30	2.46	5.28	
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.289	4.32	2.51	5.31	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Total-HxCDF	A	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Duplicate	1,2,3,7,8,9-HxCDD	G	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Duplicate	1,2,3,7,8,9-HxCDF	G	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Duplicate	Total-HpCDD	G	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Duplicate	Total-HpCDF	G	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Duplicate	Total-HxCDD	G	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Duplicate	1,2,3,4,6,7,8-HpCDF	J,R	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Duplicate	1,2,3,7,8,9-HxCDD	J,R	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Duplicate	1,2,3,7,8,9-HxCDF	J,R	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Duplicate	1,2,3,7,8-PeCDF	J,R	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Duplicate	2,3,4,6,7,8-HxCDF	J,R	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Duplicate	2,3,4,7,8-PeCDF	J,R	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Duplicate	OCDF	J,R	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Method Blank	1,2,3,4,6,7,8-HpCDD	J,R	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Method Blank	1,2,3,4,6,7,8-HpCDF	J,R	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Method Blank	1,2,3,4,7,8,9-HpCDF	J,R	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Method Blank	1,2,3,4,7,8-HxCDF	J,R	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Method Blank	1,2,3,6,7,8-HxCDD	J,R	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Method Blank	1,2,3,6,7,8-HxCDF	J,R	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Method Blank	1,2,3,7,8,9-HxCDD	J,R	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Method Blank	1,2,3,7,8-PeCDD	J,R	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Method Blank	OCDD	J,R	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Method Blank	OCDF	J,R	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Duplicate	1,2,3,4,6,7,8-HpCDD	[J]	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Duplicate	1,2,3,6,7,8-HxCDD	[J]	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Duplicate	1,2,3,7,8-PeCDD	[J]	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		

Reference Information

	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	2,3,7,8-TCDF	[J]	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Duplicate	OCDD	[J]	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Method Blank	1,2,3,7,8,9-HxCDF	[J]	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Method Blank	2,3,4,6,7,8-HxCDF	[J]	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Duplicate	1,2,3,4,7,8,9-HpCDF	[U]	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Duplicate	1,2,3,4,7,8-HxCDD	[U]	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Duplicate	1,2,3,4,7,8-HxCDF	[U]	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Duplicate	1,2,3,6,7,8-HxCDF	[U]	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Duplicate	2,3,7,8-TCDD	[U]	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Duplicate	Total-PeCDF	[U]	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Duplicate	Total-TCDD	[U]	L1561236-1, -2, -3, -4
Comments:	Duplicate had low level hits below the CS1 causing RPD failure.		
Method Blank	1,2,3,4,7,8-HxCDD	[U]	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Method Blank	1,2,3,7,8-PeCDF	[U]	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Method Blank	2,3,4,7,8-PeCDF	[U]	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Method Blank	2,3,7,8-TCDD	[U]	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Method Blank	2,3,7,8-TCDF	[U]	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Method Blank	Total-HpCDD	[U]	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Method Blank	Total-HpCDF	[U]	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Method Blank	Total-HxCDD	[U]	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Method Blank	Total-PeCDD	[U]	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Method Blank	Total-PeCDF	[U]	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Method Blank	Total-TCDD	[U]	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		
Method Blank	Total-TCDF	[U]	L1561236-1, -2, -3, -4
Comments:	There were low level hits for the HxCDF homologues, blank meets acceptance criteria of the reference method.		

Qualifiers for Individual Parameters Listed:

Qualifier	Description
A	Method Blank exceeds ALS DQO. Refer to narrative comments for further information.
DLM	Detection Limit Adjusted due to sample matrix effects.
G	QC result did not meet ALS DQO. Refer to narrative comments for further information.

Reference Information

J,R	The analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
[J]	The analyte was detected below the calibrated range but above the EDL.
[U]	The analyte was not detected above the EDL.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-TOT-ORG-LECO-SK	Soil	Organic Carbon by combustion method	SSSA (1996) p. 973

Total Organic Carbon (C-TOT-ORG-LECO-SK, C-TOT-ORG-SK)

Total C and inorganic C are determined on separate samples. The total C is determined by combustion and thermal conductivity detection, while inorganic C is determined by weight lass after addition of hydrochloric acid. Organic C is calculated by the difference between these two determinations.

Reference for Total C:
Nelson, D.W. and Sommers, L.E. 1996. Total Carbon, organic carbon and organic matter. P. 961-1010 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

Reference for Inorganic C:
Loeppert, R.H. and Suarez, D.L. 1996. Gravimetric Method for Loss of Carbon Dioxide. P. 455-456 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

CL-PASTE-COLOR-VA	Soil	Chloride in Soil (Paste) by Colourimetry	Carter-CSSS / APHA 4500-Cl E (modified)

A soil extract produced by the saturated paste extraction procedure is analyzed for chloride by ferricyanide colourimetry.

DX-1613B-HRMS-BU	Soil	Dioxins and Furans HR 1613B	USEPA 1613B

Samples are extracted by Soxhlet. The extracts are prepared using column chromatography, reduced in volume and analyzed by isotope-dilution GC/HRMS

HG-200.2-CVAF-VA	Soil	Mercury in Soil by CVAFS	EPA 200.2/1631E (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAFS.

MET-200.2-CCMS-VA	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample matrix, for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V.

MET-PASTE-ICP-VA	Soil	Metals in Soil (Paste) by ICPOES	Carter-CSSS / EPA 6010B (modified)

A soil extract produced by the saturated paste extraction procedure is analyzed for Sodium, Calcium, and Magnesium by ICPOES as per "Soil Sampling and Methods of Analysis" by M. Carter.

MOISTURE-VA	Soil	Moisture content	ASTM D2974-00 Method A

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

PAH-SUM-CALC-VA	Soil	Sum of PAH's	CALCULATION

Total PAH represents the sum of all PAH analytes reported for a given sample. Note that regulatory agencies and criteria differ in their definitions of Total PAH in terms of the individual PAH analytes to be included.

PAH-TMB-H/A-MS-VA	Soil	PAH - Rotary Extraction (Hexane/Acetone)	EPA 3570/8270

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3570 & 8270, published by the United States Environmental Protection Agency (EPA). The procedure uses a mechanical shaking technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene. The final extract is analysed by capillary column gas chromatography with mass spectrometric detection (GC/MS). Surrogate recoveries may not be reported in cases where interferences from the sample matrix prevent accurate quantitation. Because the two isomers cannot be readily chromatographically separated, benzo(j)fluoranthene is reported as part of the benzo(b)fluoranthene parameter.

PCB-CSR-SUM-CALC-VA	Soil	Total PCB (BC CSR) in soil	BC Contaminated Sites Regulation

Calculation of Total PCB to meet BC Contaminated Sites Regulation. Total PCB (BC CSR) is the sum of the concentrations of PCB aroclors 1242, 1248, 1254 and 1260. Results below detection limit (DL) are treated as zero. The Total PCB detection limit is equal to the highest of the aroclor detection limits used in the sum.

PCB-SE-ECD-VA	Soil	PCB by Extraction with GCECD	EPA8082, 3630

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3500, 3620, 3630, 3660,

Reference Information

3665 & 8082, published by the United States Environmental Protection Agency (EPA). The procedure involves a solid-liquid extraction of a subsample of the sediment/soil using a mixture of hexane and acetone. Water is added to the extract and the resulting hexane extract undergoes one or more of the following clean-up procedures (if required): florisil clean-up, silica gel clean-up, sulphur clean-up and/or sulphuric acid clean-up. The final extract is analysed by capillary column gas chromatography with electron capture detection (GC/ECD).

PCB-SUM-CALC-VA	Soil	Total PCBs in soil	CALCULATION

Calculation of Total PCB. Total PCB is the sum of the concentrations of PCB aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, and 1268. Results below detection limit (DL) are treated as zero. The Total PCB detection limit is equal to the highest of the aroclor detection limits used in the sum.

PH-1:2-VA	Soil	pH in Soil (1:2 Soil:Water Extraction)	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL

This analysis is carried out in accordance with procedures described in the pH, Electrometric in Soil and Sediment method - Section B Physical/Inorganic and Misc. Constituents, BC Environmental Laboratory Manual 2007. The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water. The pH of the solution is then measured using a standard pH probe.

PSA-PIPET-DETAIL-SK	Soil	Particle size - Sieve and Pipette	SSIR-51 METHOD 3.2.1

Particle size distribution is determined by a combination of techniques. Dry sieving is performed for coarse particles, wet sieving for sand particles and the pipette sedimentation method for clay particles.

Reference:

Burt, R. (2009). Soil Survey Field and Laboratory Methods Manual. Soil Survey Investigations Report No. 5. Method 3.2.1.2.2. United States Department of Agriculture Natural Resources Conservation Service.

SAT-PCNT-VA	Soil	Saturation Percentage	Carter-CSSS

Saturation Percentage (SP) is the total volume of water present in a saturated paste (in mL) divided by the dry weight of the sample (in grams), expressed as a percentage, as described in "Soil Sampling and Methods of Analysis" by M. Carter.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA
BU	ALS ENVIRONMENTAL - BURLINGTON, ONTARIO, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # N/A

Page 1 of 1

Report To		**Report Format / Distribution**	**Service Requested** (Rush for routine analysis subject to availability)
Company:	Stantec Consulting Ltd.	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Molly Brewis	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400A - 2261 Keating Cross Road	Email 1: molly.brewis@stantec.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saanichton, BC V8M 2A5	Email 2: karen.munro@stantec.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-858-9969 Fax: 250-544-1105	Email 3: stefan.dick@stantec.com	
Invoice To	Same as Report ? ☑ Yes ☐ No	**Client / Project Information**	**Analysis Request**
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 123220054 task 225.101	Please Indicate below Filtered, Preserved or both (F, P, F/P)
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #: Q42205	
Lab Work Order # (lab use only)		**ALS Contact:** Brent Mack	**Sampler:** MB & VG

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-CCME+FULL-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU		Archive			Number of Containers
	PM01	18-Dec-14	10:52	SEDIMENT	X	X	X	X	X	X	X	X					4
	PM02	18-Dec-14	11:11	SEDIMENT	X	X	X	X	X	X	X	X					4
	PM03	18-Dec-14	11:48	SEDIMENT	X	X	X	X	X	x	X	X					4
	DUP4	18-Dec-14		SEDIMENT	X	X	X	X	X	X	X	X					3

L1561236-COFC

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Full metal scan, to meet CCME sediment quality guidelines. Detailed breakdown of particle size for clay and silt fractions. Remaining sediment to be archived for 12 months for all samples.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Molly Brewis	18-Dec-14	14:00	YC	DEC 22/14	1440	2.1 °C				

Molly Brewis via MR SPEEDY DELIVERY

GENF 18.01 Front

STANTEC CONSULTING LTD.
ATTN: Molly Brewis
400 - 2261 Keating Cross Road
Saanichton BC V8M 2A5

Date Received: 30-JAN-16
Report Date: 09-FEB-16 18:36 (MT)
Version: FINAL

Client Phone: 250-655-6979

Certificate of Analysis

Lab Work Order #: L1729015

Project P.O. #: NOT SUBMITTED
Job Reference: 123220054 TASK 225.101
C of C Numbers: N/A
Legal Site Desc:

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1729015-1 SEDIMENT 28-JAN-16 13:57 PCL26 (0-0.5)	L1729015-2 SEDIMENT 28-JAN-16 14:07 PCL26 (0.5-1.0)	L1729015-3 SEDIMENT 28-JAN-16 14:13 PCL26 (1.0-1.5)	L1729015-4 SEDIMENT 28-JAN-16 14:20 PCL26 (1.5-2.0)	L1729015-5 SEDIMENT 28-JAN-16 14:29 PCL26 (2.0-2.3)
SOIL						
Physical Tests	Moisture (%)	30.0	26.2	24.5	25.5	26.0
Particle Size	% Gravel (>2mm) (%)	0.98	1.18	0.75	0.80	0.50
	% Sand (2.00mm - 1.00mm) (%)	2.00	1.96	1.19	1.98	2.10
	% Sand (1.00mm - 0.50mm) (%)	1.52	1.52	1.29	1.61	1.59
	% Sand (0.50mm - 0.25mm) (%)	2.14	2.14	3.50	3.50	3.69
	% Sand (0.25mm - 0.125mm) (%)	21.3	23.6	34.3	37.0	39.7
	% Sand (0.125mm - 0.063mm) (%)	26.1	31.0	31.8	30.9	30.6
	% Silt (0.063mm - 0.0312mm) (%)	13.5	13.5	11.1	10.4	9.36
	% Silt (0.0312mm - 0.004mm) (%)	18.2	14.0	8.64	7.43	6.28
	% Clay (<4um) (%)	14.4	11.2	7.46	6.39	6.10
	Texture	Sandy loam	Sandy loam	Loamy sand	Loamy sand	Loamy sand
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.37	0.97	0.86		
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	4840	4370	4490		
	% Saturation (%)	39.9	38.6	34.5		
	Sodium (Na) (mg/kg)	2400	2040	2170		
Metals	Arsenic (As) (mg/kg)	7.72	6.15	5.34		
	Cadmium (Cd) (mg/kg)	0.149	0.151	0.158		
	Chromium (Cr) (mg/kg)	22.1	19.0	16.6		
	Copper (Cu) (mg/kg)	22.8	12.9	9.24		
	Lead (Pb) (mg/kg)	7.47	3.21	2.45		
	Mercury (Hg) (mg/kg)	0.111	0.0186	0.0138		
	Nickel (Ni) (mg/kg)	15.5	12.2	9.29		
	Zinc (Zn) (mg/kg)	62.3	46.9	36.8		
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050	<0.050	<0.050		
	Acenaphthylene (mg/kg)	<0.050	<0.050	<0.050		
	Anthracene (mg/kg)	<0.050	<0.050	<0.050		
	Benz(a)anthracene (mg/kg)	<0.050	<0.050	<0.050		
	Benzo(a)pyrene (mg/kg)	<0.050	<0.050	<0.050		
	Benzo(b)fluoranthene (mg/kg)	<0.050	<0.050	<0.050		
	Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050	<0.050		
	Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050	<0.050		
	Chrysene (mg/kg)	<0.050	<0.050	<0.050		
	Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050	<0.050		
	Fluoranthene (mg/kg)	<0.050	<0.050	<0.050		
	Fluorene (mg/kg)	<0.050	<0.050	<0.050		

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1729015-6 SEDIMENT 28-JAN-16 15:25 PCL27 (0-0.5)	L1729015-7 SEDIMENT 28-JAN-16 15:32 PCL27 (0.5-1.0)	L1729015-8 SEDIMENT 28-JAN-16 15:39 PCL27 (1.0-1.5)	L1729015-9 SEDIMENT 28-JAN-16 15:56 PCL27 (1.5-1.7)	L1729015-10 SEDIMENT 28-JAN-16 12:50 PCL28 (0-0.5)
SOIL						
Physical Tests	Moisture (%)	24.2	22.4	24.7	16.0	27.9
Particle Size	% Gravel (>2mm) (%)	0.35	1.45	1.03	0.77	0.36
	% Sand (2.00mm - 1.00mm) (%)	1.13	2.74	2.17	1.57	0.83
	% Sand (1.00mm - 0.50mm) (%)	1.52	2.71	2.87	1.77	0.97
	% Sand (0.50mm - 0.25mm) (%)	4.88	6.23	5.06	2.19	2.88
	% Sand (0.25mm - 0.125mm) (%)	29.9	33.0	20.2	6.33	32.0
	% Sand (0.125mm - 0.063mm) (%)	30.7	31.4	29.2	24.5	30.2
	% Silt (0.063mm - 0.0312mm) (%)	11.8	10.2	13.3	18.6	12.0
	% Silt (0.0312mm - 0.004mm) (%)	11.2	6.54	14.2	24.8	12.1
	% Clay (<4um) (%)	8.57	5.81	12.0	19.5	8.67
	Texture	Sandy loam	Loamy sand	Sandy loam	Loam	Sandy loam
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.04	0.67	0.40		0.99
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	4310	4060	3620		4630
	% Saturation (%)	33.0	31.8	30.6		35.7
	Sodium (Na) (mg/kg)	2140	1990	1860		2520
Metals	Arsenic (As) (mg/kg)	5.09	6.61	5.65		5.09
	Cadmium (Cd) (mg/kg)	0.140	0.145	0.211		0.111
	Chromium (Cr) (mg/kg)	17.0	14.2	14.4		17.7
	Copper (Cu) (mg/kg)	12.6	7.56	10.6		13.1
	Lead (Pb) (mg/kg)	4.02	2.07	2.08		4.75
	Mercury (Hg) (mg/kg)	0.0225	0.0114	0.0113		0.0311
	Nickel (Ni) (mg/kg)	10.3	7.76	9.07		10.7
	Zinc (Zn) (mg/kg)	43.9	31.0	32.2		43.8
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050	<0.050	<0.050		<0.050
	Acenaphthylene (mg/kg)	<0.050	<0.050	<0.050		<0.050
	Anthracene (mg/kg)	<0.050	<0.050	<0.050		<0.050
	Benz(a)anthracene (mg/kg)	<0.050	<0.050	<0.050		<0.050
	Benzo(a)pyrene (mg/kg)	<0.050	<0.050	<0.050		<0.050
	Benzo(b)fluoranthene (mg/kg)	<0.050	<0.050	<0.050		<0.050
	Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050	<0.050		<0.050
	Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050	<0.050		<0.050
	Chrysene (mg/kg)	<0.050	<0.050	<0.050		<0.050
	Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050	<0.050		<0.050
	Fluoranthene (mg/kg)	<0.050	<0.050	<0.050		0.053
	Fluorene (mg/kg)	<0.050	<0.050	<0.050		<0.050

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1729015-11 SEDIMENT 28-JAN-16 13:03 PCL28 (0.5-1.0)	L1729015-12 SEDIMENT 28-JAN-16 13:10 PCL28 (1.0-1.5)	L1729015-13 SEDIMENT 28-JAN-16 13:17 PCL28 (1.5-2.0)	L1729015-14 SEDIMENT 28-JAN-16 13:26 PCL28 (2.0-2.27)	L1729015-15 SEDIMENT 28-JAN-16 11:00 PCL32 (0-0.5)
SOIL						
Physical Tests	Moisture (%)	25.2	26.0	26.5	38.2	29.7
Particle Size	% Gravel (>2mm) (%)	0.54	0.50	0.63	0.19	1.56
	% Sand (2.00mm - 1.00mm) (%)	1.58	1.24	2.37	1.02	3.92
	% Sand (1.00mm - 0.50mm) (%)	1.92	2.15	1.86	1.12	4.93
	% Sand (0.50mm - 0.25mm) (%)	3.59	3.29	1.93	1.37	8.25
	% Sand (0.25mm - 0.125mm) (%)	30.4	30.7	17.1	14.1	22.4
	% Sand (0.125mm - 0.063mm) (%)	36.0	38.4	43.7	38.9	13.4
	% Silt (0.063mm - 0.0312mm) (%)	11.9	11.5	16.3	20.8	9.45
	% Silt (0.0312mm - 0.004mm) (%)	7.97	6.40	10.3	16.3	19.0
	% Clay (<4um) (%)	6.16	5.79	5.74	6.12	17.1
	Texture	Loamy sand	Loamy sand	Loamy sand	Sandy loam	Sandy loam
Organic / Inorganic Carbon	Total Organic Carbon (%)	0.90	1.08			1.00
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	3620	5010			4630
	% Saturation (%)	32.5	35.9			40.0
	Sodium (Na) (mg/kg)	1820	2660			2350
Metals	Arsenic (As) (mg/kg)	4.86	5.99			8.18
	Cadmium (Cd) (mg/kg)	0.142	0.209			0.152
	Chromium (Cr) (mg/kg)	15.4	14.7			20.9
	Copper (Cu) (mg/kg)	8.96	8.44			19.1
	Lead (Pb) (mg/kg)	2.47	2.22			5.57
	Mercury (Hg) (mg/kg)	0.0147	0.0153			0.0316
	Nickel (Ni) (mg/kg)	8.63	8.35			15.5
	Zinc (Zn) (mg/kg)	35.2	31.7			61.2
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050	<0.050			<0.050
	Acenaphthylene (mg/kg)	<0.050	<0.050			<0.050
	Anthracene (mg/kg)	<0.050	<0.050			<0.050
	Benz(a)anthracene (mg/kg)	<0.050	<0.050			<0.050
	Benzo(a)pyrene (mg/kg)	<0.050	<0.050			<0.050
	Benzo(b)fluoranthene (mg/kg)	<0.050	<0.050			<0.050
	Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050			<0.050
	Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050			<0.050
	Chrysene (mg/kg)	<0.050	<0.050			<0.050
	Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050			<0.050
	Fluoranthene (mg/kg)	<0.050	<0.050			<0.050
	Fluorene (mg/kg)	<0.050	<0.050			<0.050

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1729015-16 SEDIMENT 28-JAN-16 11:15 PCL32 (0.5-1.0)	L1729015-17 SEDIMENT 28-JAN-16 11:30 PCL32 (1.0-1.5)	L1729015-18 SEDIMENT 28-JAN-16 11:37 PCL32 (1.5-1.82)		
	Sample ID					
	Description					
	Sampled Date					
	Sampled Time					
	Client ID					
SOIL						
Physical Tests	Moisture (%)	26.5	26.0	22.7		
Particle Size	% Gravel (>2mm) (%)	2.32	4.38	8.92		
	% Sand (2.00mm - 1.00mm) (%)	8.04	10.4	10.8		
	% Sand (1.00mm - 0.50mm) (%)	9.44	11.1	10.4		
	% Sand (0.50mm - 0.25mm) (%)	12.6	15.4	12.1		
	% Sand (0.25mm - 0.125mm) (%)	22.1	28.3	24.0		
	% Sand (0.125mm - 0.063mm) (%)	12.1	11.7	15.9		
	% Silt (0.063mm - 0.0312mm) (%)	7.49	4.78	6.01		
	% Silt (0.0312mm - 0.004mm) (%)	13.4	6.40	5.92		
	% Clay (<4um) (%)	12.6	7.63	5.93		
	Texture	Sandy loam	Loamy sand	Loamy sand		
Organic / Inorganic Carbon	Total Organic Carbon (%)	0.98	0.56			
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	4370	3680			
	% Saturation (%)	35.5	31.5			
	Sodium (Na) (mg/kg)	2160	1870			
Metals	Arsenic (As) (mg/kg)	7.72	4.98			
	Cadmium (Cd) (mg/kg)	0.168	0.225			
	Chromium (Cr) (mg/kg)	15.9	13.7			
	Copper (Cu) (mg/kg)	11.8	8.08			
	Lead (Pb) (mg/kg)	3.32	2.32			
	Mercury (Hg) (mg/kg)	0.0175	0.0148			
	Nickel (Ni) (mg/kg)	11.3	7.93			
	Zinc (Zn) (mg/kg)	43.0	30.9			
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050	<0.050			
	Acenaphthylene (mg/kg)	<0.050	<0.050			
	Anthracene (mg/kg)	<0.050	<0.050			
	Benz(a)anthracene (mg/kg)	<0.050	<0.050			
	Benzo(a)pyrene (mg/kg)	<0.050	<0.050			
	Benzo(b)fluoranthene (mg/kg)	<0.050	<0.050			
	Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050			
	Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050			
	Chrysene (mg/kg)	<0.050	<0.050			
	Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050			
	Fluoranthene (mg/kg)	<0.050	<0.050			
	Fluorene (mg/kg)	<0.050	<0.050			

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1729015-1 SEDIMENT 28-JAN-16 13:57 PCL26 (0-0.5)	L1729015-2 SEDIMENT 28-JAN-16 14:07 PCL26 (0.5-1.0)	L1729015-3 SEDIMENT 28-JAN-16 14:13 PCL26 (1.0-1.5)	L1729015-4 SEDIMENT 28-JAN-16 14:20 PCL26 (1.5-2.0)	L1729015-5 SEDIMENT 28-JAN-16 14:29 PCL26 (2.0-2.3)
Sample ID						
Description						
Sampled Date						
Sampled Time						
Client ID						
SOIL						
Polycyclic Aromatic Hydrocarbons	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050	<0.050		
	Naphthalene (mg/kg)	<0.050	<0.050	<0.050		
	Phenanthrene (mg/kg)	<0.050	<0.050	<0.050		
	Pyrene (mg/kg)	<0.050	<0.050	<0.050		
	Surrogate: Acenaphthene d10 (%)	84.9	84.9	92.5		
	Surrogate: Chrysene d12 (%)	99.3	95.2	114.5		
	Surrogate: Naphthalene d8 (%)	83.2	84.0	93.3		
	Surrogate: Phenanthrene d10 (%)	98.6	94.0	100.3		
	Total PAHs (mg/kg)	<0.20	<0.20	<0.20		
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1221 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1232 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1242 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1248 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1254 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1260 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1262 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1268 (mg/kg)	<0.020	<0.020	<0.020		
	Total PCB (BC CSR) (mg/kg)	<0.020	<0.020	<0.020		
	Total Polychlorinated Biphenyls (mg/kg)	<0.020	<0.020	<0.020		

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1729015-6 SEDIMENT 28-JAN-16 15:25 PCL27 (0-0.5)	L1729015-7 SEDIMENT 28-JAN-16 15:32 PCL27 (0.5-1.0)	L1729015-8 SEDIMENT 28-JAN-16 15:39 PCL27 (1.0-1.5)	L1729015-9 SEDIMENT 28-JAN-16 15:56 PCL27 (1.5-1.7)	L1729015-10 SEDIMENT 28-JAN-16 12:50 PCL28 (0-0.5)
SOIL						
Polycyclic Aromatic Hydrocarbons	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050	<0.050		<0.050
	Naphthalene (mg/kg)	<0.050	<0.050	<0.050		<0.050
	Phenanthrene (mg/kg)	<0.050	<0.050	<0.050		<0.050
	Pyrene (mg/kg)	<0.050	<0.050	<0.050		0.054
	Surrogate: Acenaphthene d10 (%)	81.7	89.8	85.4		89.6
	Surrogate: Chrysene d12 (%)	94.7	103.6	95.0		101.2
	Surrogate: Naphthalene d8 (%)	82.7	88.8	87.6		90.8
	Surrogate: Phenanthrene d10 (%)	91.5	97.0	91.9		97.7
	Total PAHs (mg/kg)	<0.20	<0.20	<0.20		<0.20
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020	<0.020	<0.020		<0.020
	PCB-1221 (mg/kg)	<0.020	<0.020	<0.020		<0.020
	PCB-1232 (mg/kg)	<0.020	<0.020	<0.020		<0.020
	PCB-1242 (mg/kg)	<0.020	<0.020	<0.020		<0.020
	PCB-1248 (mg/kg)	<0.020	<0.020	<0.020		<0.020
	PCB-1254 (mg/kg)	<0.020	<0.020	<0.020		<0.020
	PCB-1260 (mg/kg)	<0.020	<0.020	<0.020		<0.020
	PCB-1262 (mg/kg)	<0.020	<0.020	<0.020		<0.020
	PCB-1268 (mg/kg)	<0.020	<0.020	<0.020		<0.020
	Total PCB (BC CSR) (mg/kg)	<0.020	<0.020	<0.020		<0.020
	Total Polychlorinated Biphenyls (mg/kg)	<0.020	<0.020	<0.020		<0.020

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1729015-11 SEDIMENT 28-JAN-16 13:03 PCL28 (0.5-1.0)	L1729015-12 SEDIMENT 28-JAN-16 13:10 PCL28 (1.0-1.5)	L1729015-13 SEDIMENT 28-JAN-16 13:17 PCL28 (1.5-2.0)	L1729015-14 SEDIMENT 28-JAN-16 13:26 PCL28 (2.0-2.27)	L1729015-15 SEDIMENT 28-JAN-16 11:00 PCL32 (0-0.5)
SOIL						
Polycyclic Aromatic Hydrocarbons	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050			<0.050
	Naphthalene (mg/kg)	<0.050	<0.050			<0.050
	Phenanthrene (mg/kg)	<0.050	<0.050			<0.050
	Pyrene (mg/kg)	<0.050	<0.050			<0.050
	Surrogate: Acenaphthene d10 (%)	86.9	91.7			95.3
	Surrogate: Chrysene d12 (%)	96.5	96.5			99.9
	Surrogate: Naphthalene d8 (%)	89.4	93.4			95.7
	Surrogate: Phenanthrene d10 (%)	97.5	96.1			102.2
	Total PAHs (mg/kg)	<0.20	<0.20			<0.20
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020	<0.020			<0.020
	PCB-1221 (mg/kg)	<0.020	<0.020			<0.020
	PCB-1232 (mg/kg)	<0.020	<0.020			<0.020
	PCB-1242 (mg/kg)	<0.020	<0.020			<0.020
	PCB-1248 (mg/kg)	<0.020	<0.020			<0.020
	PCB-1254 (mg/kg)	<0.020	<0.020			<0.020
	PCB-1260 (mg/kg)	<0.020	<0.020			<0.020
	PCB-1262 (mg/kg)	<0.020	<0.020			<0.020
	PCB-1268 (mg/kg)	<0.020	<0.020			<0.020
	Total PCB (BC CSR) (mg/kg)	<0.020	<0.020			<0.020
	Total Polychlorinated Biphenyls (mg/kg)	<0.020	<0.020			<0.020

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1729015-16	L1729015-17	L1729015-18		
	Description	SEDIMENT	SEDIMENT	SEDIMENT		
	Sampled Date	28-JAN-16	28-JAN-16	28-JAN-16		
	Sampled Time	11:15	11:30	11:37		
	Client ID	PCL32 (0.5-1.0)	PCL32 (1.0-1.5)	PCL32 (1.5-1.82)		
Grouping	**Analyte**					
SOIL						
Polycyclic Aromatic Hydrocarbons	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050			
	Naphthalene (mg/kg)	<0.050	<0.050			
	Phenanthrene (mg/kg)	<0.050	<0.050			
	Pyrene (mg/kg)	<0.050	<0.050			
	Surrogate: Acenaphthene d10 (%)	86.5	87.9			
	Surrogate: Chrysene d12 (%)	97.9	95.8			
	Surrogate: Naphthalene d8 (%)	88.0	92.2			
	Surrogate: Phenanthrene d10 (%)	93.5	90.1			
	Total PAHs (mg/kg)	<0.20	<0.20			
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020	<0.020			
	PCB-1221 (mg/kg)	<0.020	<0.020			
	PCB-1232 (mg/kg)	<0.020	<0.020			
	PCB-1242 (mg/kg)	<0.020	<0.020			
	PCB-1248 (mg/kg)	<0.020	<0.020			
	PCB-1254 (mg/kg)	<0.020	<0.020			
	PCB-1260 (mg/kg)	<0.020	<0.020			
	PCB-1262 (mg/kg)	<0.020	<0.020			
	PCB-1268 (mg/kg)	<0.020	<0.020			
	Total PCB (BC CSR) (mg/kg)	<0.020	<0.020			
	Total Polychlorinated Biphenyls (mg/kg)	<0.020	<0.020			

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-TOT-ORG-LECO-SK	Soil	Organic Carbon by combustion method	SSSA (1996) p. 973

Total Organic Carbon (C-TOT-ORG-LECO-SK, C-TOT-ORG-SK)

Total C and inorganic C are determined on separate samples. The total C is determined by combustion and thermal conductivity detection, while inorganic C is determined by weight lass after addition of hydrochloric acid. Organic C is calculated by the difference between these two determinations.

Reference for Total C:
Nelson, D.W. and Sommers, L.E. 1996. Total Carbon, organic carbon and organic matter. P. 961-1010 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

Reference for Inorganic C:
Loeppert, R.H. and Suarez, D.L. 1996. Gravimetric Method for Loss of Carbon Dioxide. P. 455-456 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

CL-PASTE-COLOR-VA	Soil	Chloride in Soil (Paste) by Colourimetry	Carter-CSSS / APHA 4500-Cl E (modified)

A soil extract produced by the saturated paste extraction procedure is analyzed for chloride by ferricyanide colourimetry.

HG-200.2-CVAF-VA	Soil	Mercury in Soil by CVAFS	EPA 200.2/1631E (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAFS.

MET-200.2-CCMS-VA	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample matrix, for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V.

MET-PASTE-ICP-VA	Soil	Metals in Soil (Paste) by ICPOES	Carter-CSSS / EPA 6010B (modified)

A soil extract produced by the saturated paste extraction procedure is analyzed for Sodium, Calcium, and Magnesium by ICPOES as per "Soil Sampling and Methods of Analysis" by M. Carter.

MOISTURE-VA	Soil	Moisture content	ASTM D2974-00 Method A

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

PAH-SUM-CALC-VA	Soil	Sum of PAH's	CALCULATION

Total PAH represents the sum of all PAH analytes reported for a given sample. Note that regulatory agencies and criteria differ in their definitions of Total PAH in terms of the individual PAH analytes to be included.

PAH-TMB-H/A-MS-VA	Soil	PAH - Rotary Extraction (Hexane/Acetone)	EPA 3570/8270

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3570 & 8270, published by the United States Environmental Protection Agency (EPA). The procedure uses a mechanical shaking technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene. The final extract is analysed by capillary column gas chromatography with mass spectrometric detection (GC/MS). Surrogate recoveries may not be reported in cases where interferences from the sample matrix prevent accurate quantitation. Because the two isomers cannot be readily chromatographically separated, benzo(j)fluoranthene is reported as part of the benzo(b)fluoranthene parameter.

PCB-CSR-SUM-CALC-VA	Soil	Total PCB (BC CSR) in soil	BC Contaminated Sites Regulation

Calculation of Total PCB to meet BC Contaminated Sites Regulation. Total PCB (BC CSR) is the sum of the concentrations of PCB aroclors 1242, 1248, 1254 and 1260. Results below detection limit (DL) are treated as zero. The Total PCB detection limit is equal to the highest of the aroclor detection limits used in the sum.

PCB-SE-ECD-VA	Soil	PCB by Extraction with GCECD	EPA8082, 3630

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3500, 3620, 3630, 3660, 3665 & 8082, published by the United States Environmental Protection Agency (EPA). The procedure involves a solid-liquid extraction of a subsample of the sediment/soil using a mixture of hexane and acetone. Water is added to the extract and the resulting hexane extract undergoes one or more of the following clean-up procedures (if required): florisil clean-up, silica gel clean-up, sulphur clean-up and/or sulphuric acid clean-up. The final extract is analysed by capillary column gas chromatography with electron capture detection (GC/ECD).

PCB-SUM-CALC-VA	Soil	Total PCBs in soil	CALCULATION

Calculation of Total PCB. Total PCB is the sum of the concentrations of PCB aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, and 1268. Results below detection limit (DL) are treated as zero. The Total PCB detection limit is equal to the highest of the aroclor detection limits used in the sum.

PSA-PIPET-DETAIL-SK	Soil	Particle size - Sieve and Pipette	SSIR-51 METHOD 3.2.1

Particle size distribution is determined by a combination of techniques. Dry sieving is performed for coarse particles, wet sieving for sand particles and the pipette sedimentation method for clay particles.

Reference Information

Reference:

Burt, R. (2009). Soil Survey Field and Laboratory Methods Manual. Soil Survey Investigations Report No. 5. Method 3.2.1.2.2. United States Department of Agriculture Natural Resources Conservation Service.

SAT-PCNT-VA	Soil	Saturation Percentage	Carter-CSSS

Saturation Percentage (SP) is the total volume of water present in a saturated paste (in mL) divided by the dry weight of the sample (in grams), expressed as a percentage, as described in "Soil Sampling and Methods of Analysis" by M. Carter.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

N/A

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # N/A

Report To		Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company:	Stantec Consulting Ltd.	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Molly Brewis	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400A-2261 Keating Cross Road	Email 1: molly.brewis@stantec.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saanichton, BC V8M 2A5	Email 2: karen.munro@stantec.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-858-9969 Fax: 250-544-1105	Email 3: stefan.dick@stantec.com	**Analysis Request**
Invoice To	Same as Report ? ☑ Yes ☐ No	**Client / Project Information**	Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 123220054 task 225.101	
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:		Quote #:	
Lab W (lab	L1729015-COFC	**ALS Contact:** Brent Mack **Sampler:** SW & BT	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-OD-200.2-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU		Archive			Number of Containers
	PCL26 (0-0.5)	28-Jan-16	13:57	SEDIMENT	X	X	X	X	X	X	X						3
	PCL26 (0.5-1.0)	28-Jan-16	14:07	SEDIMENT	X	X	X	X	X	X	X						3
	PCL26 (1.0-1.5)	28-Jan-16	14:13	SEDIMENT	X	X	X	X	X	X	X						3
	PCL26 (1.5-2.0)	28-Jan-16	14:20	SEDIMENT				X	X					X			3
	PCL26 (2.0-2.3)	28-Jan-16	14:29	SEDIMENT				X	X					X			3
	PCL27 (0-0.5)	28-Jan-16	15:25	SEDIMENT	X	X	X	X	X	X	X						3
	PCL27 (0.5-1.0)	28-Jan-16	15:32	SEDIMENT	X	X	X	X	X	X	X						3
	PCL27 (1.0-1.5)	28-Jan-16	15:39	SEDIMENT	X	X	X	X	X	X	X						3
	PCL27 (1.5-1.7)	28-Jan-16	15:56	SEDIMENT				X	X					X			3
	PCL28 (0-0.5)	28-Jan-16	12:50	SEDIMENT	X	X	X	X	X	X	X						3
	PCL28 (0.5-1.0)	28-Jan-16	13:03	SEDIMENT	X	X	X	X	X	X	X						3
	PCL28 (1.0-1.5)	28-Jan-16	13:10	SEDIMENT	X	X	X	X	X	X	X						3
	PCL28 (1.5-2.0)	28-Jan-16	13:17	SEDIMENT				X	X					X			3
	PCL28 (2.0-2.27)	28-Jan-16	13:26	SEDIMENT				X	X					X			3
	PCL32 (0-0.5)	28-Jan-16	11:00	SEDIMENT	X	X	X	X	X	X	X						3

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Detailed breakdown of particle size for clay and silt fractions. Some samples for analysis AND archival (6 months).

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Sandra Warren	29-Jan-16	7:00	[illegible]	Jan 30	1030	5,4,6°C				

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # N/A

Report To		**Report Format / Distribution**	**Service Requested** (Rush for routine analysis subject to availability)
Company:	Stantec Consulting Ltd.	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Molly Brewis	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400A-2261 Keating Cross Road	Email 1: molly.brewis@stantec.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saanichton, BC V8M 2A5	Email 2: karen.munro@stantec.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-858-9969 Fax: 250-544-1105	Email 3: stefan.dick@stantec.com	**Analysis Request**
Invoice To	Same as Report ? ☑ Yes ☐ No	**Client / Project Information**	Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 123220054 task 225.101	
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:		Quote #:	
Lab W (lab		**ALS Contact:** Brent Mack **Sampler:** SW & BT	

L1729015-COFC

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-OD-200.2-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU		Archive			Number of Containers
	PCL32 (0.5-1.0)	28-Jan-16	11:15	SEDIMENT	X	X	X	X	X	X	X						3
	PCL32 (1.0-1.5)	28-Jan-16	11:30	SEDIMENT	X	X	X	X	X	X	X						3
	PCL32 (1.5-1.82)	28-Jan-16	11:37	SEDIMENT				X	X					X			3

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Detailed breakdown of particle size for clay and silt fractions. Some samples for analysis AND archival (6 months).

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? if Yes add SIF
Sandra Warren	29-Jan-16	7:00	[illegible]	Jan 30	1030	5.4 °C				

STANTEC CONSULTING LTD.
ATTN: Molly Brewis
400 - 2261 Keating Cross Road
Saanichton BC V8M 2A5

Date Received: 22-JAN-16
Report Date: 22-FEB-16 14:03 (MT)
Version: FINAL

Client Phone: 250-655-6979

Certificate of Analysis

Lab Work Order #: L1726336

Project P.O. #: NOT SUBMITTED
Job Reference: 123220054 TASK 525.100
C of C Numbers:
Legal Site Desc:

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1726336-1 Sediment 21-JAN-16 11:42 PCS29 (0-0.2)	L1726336-2 Sediment 21-JAN-16 11:47 PCS29 (0.2-0.4)	L1726336-3 Sediment 21-JAN-16 11:50 PCS29 (0.4-0.6)	L1726336-4 Sediment 21-JAN-16 11:54 PCS29 (0.6-0.8)	L1726336-5 Sediment 21-JAN-16 11:58 PCS29 (0.8-1.0)
Sample ID / Description / Sampled Date / Sampled Time / Client ID						
SOIL						
Physical Tests	% Moisture (%)	19.6	18.8	19.1	18.2	18.3
	Moisture (%)					
Particle Size	% Gravel (>2mm) (%)	1.47	1.24	0.95	1.26	1.46
	% Sand (2.00mm - 1.00mm) (%)	2.85	3.48	2.85	3.92	4.69
	% Sand (1.00mm - 0.50mm) (%)	4.68	6.27	6.20	7.20	8.72
	% Sand (0.50mm - 0.25mm) (%)	9.19	10.4	9.80	11.2	14.2
	% Sand (0.25mm - 0.125mm) (%)	29.3	28.5	26.9	28.5	30.6
	% Sand (0.125mm - 0.063mm) (%)	28.0	26.5	29.2	27.2	23.6
	% Silt (0.063mm - 0.0312mm) (%)	9.96	9.43	9.81	8.92	7.33
	% Silt (0.0312mm - 0.004mm) (%)	8.35	8.17	8.15	6.78	5.12
	% Clay (<4um) (%)	6.19	6.03	6.22	4.98	4.31
	Texture	Loamy sand	Loamy sand	Loamy sand	Loamy sand	Sand
Organic / Inorganic Carbon	Total Organic Carbon (%)	0.63	0.58	0.62	0.53	0.75
Saturated Paste Extractables	Chloride (Cl) (mg/kg)					
	% Saturation (%)					
	Sodium (Na) (mg/kg)					
Metals	Arsenic (As) (mg/kg)					
	Cadmium (Cd) (mg/kg)					
	Chromium (Cr) (mg/kg)					
	Copper (Cu) (mg/kg)					
	Lead (Pb) (mg/kg)					
	Mercury (Hg) (mg/kg)					
	Nickel (Ni) (mg/kg)					
	Zinc (Zn) (mg/kg)					
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)					
	Acenaphthylene (mg/kg)					
	Anthracene (mg/kg)					
	Benz(a)anthracene (mg/kg)					
	Benzo(a)pyrene (mg/kg)					
	Benzo(b)fluoranthene (mg/kg)					
	Benzo(g,h,i)perylene (mg/kg)					
	Benzo(k)fluoranthene (mg/kg)					
	Chrysene (mg/kg)					
	Dibenz(a,h)anthracene (mg/kg)					
	Fluoranthene (mg/kg)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1726336-7				
	Description	Sediment				
	Sampled Date	21-JAN-16				
	Sampled Time	11:00				
	Client ID	SS11 (0.0-0.075)				
Grouping	**Analyte**					
SOIL						
Physical Tests	% Moisture (%)					
	Moisture (%)	26.6				
Particle Size	% Gravel (>2mm) (%)	<0.10				
	% Sand (2.00mm - 1.00mm) (%)	0.71				
	% Sand (1.00mm - 0.50mm) (%)	0.88				
	% Sand (0.50mm - 0.25mm) (%)	8.78				
	% Sand (0.25mm - 0.125mm) (%)	46.9				
	% Sand (0.125mm - 0.063mm) (%)	22.2				
	% Silt (0.063mm - 0.0312mm) (%)	7.98				
	% Silt (0.0312mm - 0.004mm) (%)	7.37				
	% Clay (<4um) (%)	5.15				
	Texture	Loamy sand				
Organic / Inorganic Carbon	Total Organic Carbon (%)	0.82				
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	3930				
	% Saturation (%)	34.6				
	Sodium (Na) (mg/kg)	1970				
Metals	Arsenic (As) (mg/kg)	3.85				
	Cadmium (Cd) (mg/kg)	0.128				
	Chromium (Cr) (mg/kg)	17.3				
	Copper (Cu) (mg/kg)	11.1				
	Lead (Pb) (mg/kg)	4.19				
	Mercury (Hg) (mg/kg)	0.0200				
	Nickel (Ni) (mg/kg)	8.38				
	Zinc (Zn) (mg/kg)	41.1				
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050				
	Acenaphthylene (mg/kg)	<0.050				
	Anthracene (mg/kg)	<0.050				
	Benz(a)anthracene (mg/kg)	<0.050				
	Benzo(a)pyrene (mg/kg)	<0.050				
	Benzo(b)fluoranthene (mg/kg)	<0.050				
	Benzo(g,h,i)perylene (mg/kg)	<0.050				
	Benzo(k)fluoranthene (mg/kg)	<0.050				
	Chrysene (mg/kg)	<0.050				
	Dibenz(a,h)anthracene (mg/kg)	<0.050				
	Fluoranthene (mg/kg)	0.095				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1726336-1	L1726336-2	L1726336-3	L1726336-4	L1726336-5
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	21-JAN-16	21-JAN-16	21-JAN-16	21-JAN-16	21-JAN-16
	Sampled Time	11:42	11:47	11:50	11:54	11:58
	Client ID	PCS29 (0-0.2)	PCS29 (0.2-0.4)	PCS29 (0.4-0.6)	PCS29 (0.6-0.8)	PCS29 (0.8-1.0)
Grouping	**Analyte**					
SOIL						
Polycyclic Aromatic Hydrocarbons	Fluorene (mg/kg)					
	Indeno(1,2,3-c,d)pyrene (mg/kg)					
	Naphthalene (mg/kg)					
	Phenanthrene (mg/kg)					
	Pyrene (mg/kg)					
	Surrogate: Acenaphthene d10 (%)					
	Surrogate: Chrysene d12 (%)					
	Surrogate: Naphthalene d8 (%)					
	Surrogate: Phenanthrene d10 (%)					
	Total PAHs (mg/kg)					
Polychlorinated Biphenyls	Aroclor 1016 (mg/kg)					
	Aroclor 1221 (mg/kg)					
	Aroclor 1232 (mg/kg)					
	Aroclor 1242 (mg/kg)					
	Aroclor 1248 (mg/kg)					
	Aroclor 1254 (mg/kg)					
	Aroclor 1260 (mg/kg)					
	Aroclor 1262 (mg/kg)					
	Aroclor 1268 (mg/kg)					
	Surrogate: Decachlorobiphenyl (%)					
	Total PCBs (mg/kg)					
Dioxins and Furans	WHO1998 Fish Lower Bound TEQ (ND=0) (pg/g)	0.00424	0.000134	0.0012783	0.00004727	0.0000368
	WHO1998 Fish Mid Bound TEQ (ND=1/2EDL) (pg/g)	0.120235	0.118946	0.1103033	0.12033627	0.11963595
	WHO1998 Fish Upper Bound TEQ (ND=EDL) (pg/g)	0.2234	0.225081	0.2152233	0.24053127	0.2386151
	2,3,7,8-TCDD (pg/g)	[U] <0.076	[U] <0.075	[U] <0.082	[U] <0.095	[U] <0.079
	1,2,3,7,8-PeCDD (pg/g)	[U] <0.057	[U] <0.050	[U] <0.048	[U] <0.067	[U] <0.072
	1,2,3,4,7,8-HxCDD (pg/g)	[U] <0.056	[U] <0.077	[U] <0.075	[U] <0.074	[U] <0.088
	1,2,3,6,7,8-HxCDD (pg/g)	M,J,R 0.067	M,U <0.072	[U] <0.071	[U] <0.069	[U] <0.083
	1,2,3,7,8,9-HxCDD (pg/g)	[U] <0.054	[U] <0.074	[U] <0.072	[U] <0.071	[U] <0.085
	1,2,3,4,6,7,8-HpCDD (pg/g)	M,J 0.23	M,J,R 0.260	M,J,R 0.140	M,J,R 0.094	[U] <0.090
	OCDD (pg/g)	J,R 0.920	[J] 1.34	J,B 0.883	M,J,B 0.373	M,J,B 0.368
	Total-TCDD (pg/g)	[U] <0.076	[U] <0.075	[U] <0.082	[U] <0.095	[U] <0.079
	Total TCDD # Homologues	0	0	0	0	0
	Total-PeCDD (pg/g)	[U] <0.057	[U] <0.050	[U] <0.048	[U] <0.067	[U] <0.072

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1726336-7				
	Description	Sediment				
	Sampled Date	21-JAN-16				
	Sampled Time	11:00				
	Client ID	SS11 (0.0-0.075)				
Grouping	**Analyte**					
SOIL						
Polycyclic Aromatic Hydrocarbons	Fluorene (mg/kg)	<0.050				
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050				
	Naphthalene (mg/kg)	<0.050				
	Phenanthrene (mg/kg)	<0.050				
	Pyrene (mg/kg)	0.067				
	Surrogate: Acenaphthene d10 (%)	91.0				
	Surrogate: Chrysene d12 (%)	99.4				
	Surrogate: Naphthalene d8 (%)	87.7				
	Surrogate: Phenanthrene d10 (%)	102.4				
	Total PAHs (mg/kg)	<0.20				
Polychlorinated Biphenyls	Aroclor 1016 (mg/kg)	<0.010				
	Aroclor 1221 (mg/kg)	<0.010				
	Aroclor 1232 (mg/kg)	<0.010				
	Aroclor 1242 (mg/kg)	<0.010				
	Aroclor 1248 (mg/kg)	<0.010				
	Aroclor 1254 (mg/kg)	<0.010				
	Aroclor 1260 (mg/kg)	<0.010				
	Aroclor 1262 (mg/kg)	<0.010				
	Aroclor 1268 (mg/kg)	<0.010				
	Surrogate: Decachlorobiphenyl (%)	117.1				
	Total PCBs (mg/kg)	<0.020				
Dioxins and Furans	WHO1998 Fish Lower Bound TEQ (ND=0) (pg/g)					
	WHO1998 Fish Mid Bound TEQ (ND=1/2EDL) (pg/g)					
	WHO1998 Fish Upper Bound TEQ (ND=EDL) (pg/g)					
	2,3,7,8-TCDD (pg/g)					
	1,2,3,7,8-PeCDD (pg/g)					
	1,2,3,4,7,8-HxCDD (pg/g)					
	1,2,3,6,7,8-HxCDD (pg/g)					
	1,2,3,7,8,9-HxCDD (pg/g)					
	1,2,3,4,6,7,8-HpCDD (pg/g)					
	OCDD (pg/g)					
	Total-TCDD (pg/g)					
	Total TCDD # Homologues					
	Total-PeCDD (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1726336-1	L1726336-2	L1726336-3	L1726336-4	L1726336-5
Description	Sediment	Sediment	Sediment	Sediment	Sediment
Sampled Date	21-JAN-16	21-JAN-16	21-JAN-16	21-JAN-16	21-JAN-16
Sampled Time	11:42	11:47	11:50	11:54	11:58
Client ID	PCS29 (0-0.2)	PCS29 (0.2-0.4)	PCS29 (0.4-0.6)	PCS29 (0.6-0.8)	PCS29 (0.8-1.0)
Grouping / **Analyte**					
SOIL					
Dioxins and Furans					
Total PeCDD # Homologues	0	0	0	0	0
Total-HxCDD (pg/g)	0.321	0.181	<0.075 [U]	<0.074 [U]	<0.088 [U]
Total HxCDD # Homologues	2	2	0	0	0
Total-HpCDD (pg/g)	0.23	<0.068 [U]	<0.074 [U]	<0.070 [U]	<0.090 [U]
Total HpCDD # Homologues	1	0	0	0	0
2,3,7,8-TCDF (pg/g)	0.080 [M,J]	0.210 [M,J,R]	0.079 [M,J,R]	<0.063 [M,U]	<0.057 [U]
1,2,3,7,8-PeCDF (pg/g)	<0.037 [U]	<0.043 [U]	<0.038 [U]	<0.032 [U]	<0.039 [U]
2,3,4,7,8-PeCDF (pg/g)	<0.032 [U]	<0.038 [U]	<0.033 [U]	<0.030 [U]	<0.036 [U]
1,2,3,4,7,8-HxCDF (pg/g)	<0.065 [U]	<0.060 [U]	<0.051 [U]	<0.048 [U]	<0.043 [U]
1,2,3,6,7,8-HxCDF (pg/g)	<0.060 [U]	<0.059 [U]	<0.049 [U]	<0.041 [U]	<0.041 [U]
1,2,3,7,8,9-HxCDF (pg/g)	<0.080 [U]	<0.080 [U]	<0.072 [M,U]	<0.060 [U]	<0.054 [U]
2,3,4,6,7,8-HxCDF (pg/g)	<0.059 [U]	<0.056 [U]	<0.047 [U]	<0.043 [U]	<0.040 [M,U]
1,2,3,4,6,7,8-HpCDF (pg/g)	1.20 [M,J,R]	0.190 [M,J,R]	0.119 [M,J,B]	<0.042 [U]	0.062 [M,J,R]
1,2,3,4,7,8,9-HpCDF (pg/g)	<0.054 [U]	<0.066 [U]	<0.061 [U]	<0.062 [U]	<0.058 [U]
OCDF (pg/g)	0.680 [M,J,R]	0.170 [J,R]	0.150 [M,J,R]	0.100 [M,J]	<0.083 [M,U]
Total-TCDF (pg/g)	0.080	0.318	0.281	<0.063 [U]	<0.057 [U]
Total TCDF # Homologues	1	2	1	0	0
Total-PeCDF (pg/g)	<0.037 [U]	<0.043 [U]	<0.038 [U]	<0.032 [U]	<0.039 [U]
Total PeCDF # Homologues	0	0	0	0	0
Total-HxCDF (pg/g)	0.405	<0.080 [U]	<0.072 [U]	<0.060 [U]	<0.054 [U]
Total HxCDF # Homologues	3	0	0	0	0
Total-HpCDF (pg/g)	0.784	0.190	0.119	<0.062 [U]	<0.058 [U]
Total HpCDF # Homologues	1	1	1	0	0
Surrogate: 13C12-2,3,7,8-TCDD (%)	60.0	58.0	52.0	53.0	62.0
Surrogate: 13C12-1,2,3,7,8-PeCDD (%)	53.0	49.0	45.0	44.0	49.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)	75.0	76.0	68.0	72.0	75.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)	83.0	90.0	73.0	79.0	87.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)	75.0	74.0	63.0	67.0	71.0
Surrogate: 13C12-OCDD (%)	66.0	68.0	58.0	63.0	67.0
Surrogate: 13C12-2,3,7,8-TCDF (%)	57.0	55.0	50.0	49.0	58.0
Surrogate: 13C12-1,2,3,7,8-PeCDF (%)	50.0	47.0	44.0	44.0	48.0
Surrogate: 13C12-2,3,4,7,8-PeCDF (%)	49.0	45.0	44.0	41.0	46.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)	74.0	75.0	61.0	67.0	72.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)	77.0	83.0	70.0	74.0	83.0
Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)	77.0	79.0	68.0	74.0	76.0
Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)	72.0	71.0	57.0	66.0	71.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)	74.0	74.0	66.0	69.0	74.0

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1726336-7				
	Description	Sediment				
	Sampled Date	21-JAN-16				
	Sampled Time	11:00				
	Client ID	SS11 (0.0-0.075)				
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total PeCDD # Homologues					
	Total-HxCDD (pg/g)					
	Total HxCDD # Homologues					
	Total-HpCDD (pg/g)					
	Total HpCDD # Homologues					
	2,3,7,8-TCDF (pg/g)					
	1,2,3,7,8-PeCDF (pg/g)					
	2,3,4,7,8-PeCDF (pg/g)					
	1,2,3,4,7,8-HxCDF (pg/g)					
	1,2,3,6,7,8-HxCDF (pg/g)					
	1,2,3,7,8,9-HxCDF (pg/g)					
	2,3,4,6,7,8-HxCDF (pg/g)					
	1,2,3,4,6,7,8-HpCDF (pg/g)					
	1,2,3,4,7,8,9-HpCDF (pg/g)					
	OCDF (pg/g)					
	Total-TCDF (pg/g)					
	Total TCDF # Homologues					
	Total-PeCDF (pg/g)					
	Total PeCDF # Homologues					
	Total-HxCDF (pg/g)					
	Total HxCDF # Homologues					
	Total-HpCDF (pg/g)					
	Total HpCDF # Homologues					
	Surrogate: 13C12-2,3,7,8-TCDD (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)					
	Surrogate: 13C12-OCDD (%)					
	Surrogate: 13C12-2,3,7,8-TCDF (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)					
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)					
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1726336-1	L1726336-2	L1726336-3	L1726336-4	L1726336-5
Description	Sediment	Sediment	Sediment	Sediment	Sediment
Sampled Date	21-JAN-16	21-JAN-16	21-JAN-16	21-JAN-16	21-JAN-16
Sampled Time	11:42	11:47	11:50	11:54	11:58
Client ID	PCS29 (0-0.2)	PCS29 (0.2-0.4)	PCS29 (0.4-0.6)	PCS29 (0.6-0.8)	PCS29 (0.8-1.0)
Grouping / **Analyte**					
SOIL					
Dioxins and Furans					
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)	73.0	73.0	61.0	66.0	71.0
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)	51.0	49.0	48.0	45.0	54.0
Toxic Equivalency					
Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.0103	0.000402	0.00145	0.000142	0.000110
Mid Point PCDD/F TEQ (WHO 2005) (pg/g)	0.120	0.119	0.103	0.111	0.108
Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.211	0.212	0.196	0.221	0.214

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1726336-7				
	Description	Sediment				
	Sampled Date	21-JAN-16				
	Sampled Time	11:00				
	Client ID	SS11 (0.0-0.075)				
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)					
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)					
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)					
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)					
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Mercury (Hg)	DUP-H	L1726336-7
Duplicate	Copper (Cu)	DUP-H	L1726336-7
Duplicate	Lead (Pb)	DUP-H	L1726336-7
Duplicate	Nickel (Ni)	DUP-H	L1726336-7
Duplicate	Zinc (Zn)	DUP-H	L1726336-7
Duplicate	Chromium (Cr)	DUP-H	L1726336-7
Duplicate	Copper (Cu)	DUP-H	L1726336-7
Duplicate	Lead (Pb)	DUP-H	L1726336-7
Duplicate	Nickel (Ni)	DUP-H	L1726336-7
Duplicate	Zinc (Zn)	DUP-H	L1726336-7
Duplicate	1,2,3,4,6,7,8-HpCDF	G	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	OCDF	G	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	Total-HpCDF	G	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	Total-HxCDF	G	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	OCDD	J,B	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	Total-HxCDD	J,G	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Method Blank	1,2,3,4,6,7,8-HpCDF	M,J	L1726336-1, -2, -3, -4, -5
Method Blank	OCDD	M,J	L1726336-1, -2, -3, -4, -5
Method Blank	1,2,3,7,8,9-HxCDF	M,J,R	L1726336-1, -2, -3, -4, -5
Method Blank	OCDF	M,J,R	L1726336-1, -2, -3, -4, -5
Duplicate	1,2,3,4,6,7,8-HpCDD	M,J,R	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	1,2,3,4,6,7,8-HpCDF	M,J,R	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	OCDF	M,J,R	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Method Blank	1,2,3,7,8-PeCDF	M,U	L1726336-1, -2, -3, -4, -5
Method Blank	2,3,4,7,8-PeCDF	M,U	L1726336-1, -2, -3, -4, -5
Method Blank	1,2,3,4,6,7,8-HpCDD	[U]	L1726336-1, -2, -3, -4, -5
Method Blank	1,2,3,4,7,8,9-HpCDF	[U]	L1726336-1, -2, -3, -4, -5
Method Blank	1,2,3,4,7,8-HxCDD	[U]	L1726336-1, -2, -3, -4, -5
Method Blank	1,2,3,4,7,8-HxCDF	[U]	L1726336-1, -2, -3, -4, -5
Method Blank	1,2,3,6,7,8-HxCDD	[U]	L1726336-1, -2, -3, -4, -5
Method Blank	1,2,3,6,7,8-HxCDF	[U]	L1726336-1, -2, -3, -4, -5
Method Blank	1,2,3,7,8,9-HxCDD	[U]	L1726336-1, -2, -3, -4, -5
Method Blank	1,2,3,7,8-PeCDD	[U]	L1726336-1, -2, -3, -4, -5
Method Blank	2,3,4,6,7,8-HxCDF	[U]	L1726336-1, -2, -3, -4, -5
Method Blank	2,3,7,8-TCDD	[U]	L1726336-1, -2, -3, -4, -5
Method Blank	2,3,7,8-TCDF	[U]	L1726336-1, -2, -3, -4, -5
Method Blank	Total-HpCDD	[U]	L1726336-1, -2, -3, -4, -5
Method Blank	Total-HpCDF	[U]	L1726336-1, -2, -3, -4, -5
Method Blank	Total-HxCDD	[U]	L1726336-1, -2, -3, -4, -5
Method Blank	Total-HxCDF	[U]	L1726336-1, -2, -3, -4, -5
Method Blank	Total-PeCDD	[U]	L1726336-1, -2, -3, -4, -5
Method Blank	Total-PeCDF	[U]	L1726336-1, -2, -3, -4, -5
Method Blank	Total-TCDD	[U]	L1726336-1, -2, -3, -4, -5

Reference Information

	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Total-TCDF	[U]	L1726336-1, -2, -3, -4, -5
Duplicate	1,2,3,4,7,8,9-HpCDF	[U]	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	1,2,3,4,7,8-HxCDD	[U]	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	1,2,3,4,7,8-HxCDF	[U]	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	1,2,3,6,7,8-HxCDD	[U]	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	1,2,3,6,7,8-HxCDF	[U]	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	1,2,3,7,8,9-HxCDD	[U]	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	1,2,3,7,8,9-HxCDF	[U]	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	1,2,3,7,8-PeCDD	[U]	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	1,2,3,7,8-PeCDF	[U]	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	2,3,4,6,7,8-HxCDF	[U]	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	2,3,4,7,8-PeCDF	[U]	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	2,3,7,8-TCDD	[U]	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	2,3,7,8-TCDF	[U]	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	Total-HpCDD	[U]	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	Total-HxCDF	[U]	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	Total-PeCDD	[U]	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	Total-PeCDF	[U]	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	Total-TCDD	[U]	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		
Duplicate	Total-TCDF	[U]	L1726336-1, -2, -3, -4, -5
Comments:	Sample and duplicate outside method RPD criteria for selected low level targets		

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
G	QC result did not meet ALS DQO. Refer to narrative comments for further information.
J,B	The analyte was detected below the calibrated range but above the EDL, and was detected in the Method Blank at >10% of the sample concentration.
J,G	QC result did not meet ALS DQO. Refer to narrative comments for further information. Duplicate expressed in terms of absolute difference.
J,R	The analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,J	A peak has been manually integrated, and the analyte was detected below the calibrated range but above the EDL.
M,J,B	A peak has been manually integrated. Target analyte was detected below the calibrated range but above the EDL. Compound was detected in the method blank at >10% of the sample concentration.
	A peak has been manually integrated, the analyte was detected below the calibrated range but above the EDL, and the ion abundance

Reference Information

M,J,R	ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,U	A peak has been manually integrated, and the analyte was not detected above the EDL.
[J]	The analyte was detected below the calibrated range but above the EDL.
[U]	The analyte was not detected above the EDL.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-TOT-ORG-LECO-SK	Soil	Organic Carbon by combustion method	SSSA (1996) p. 973

Total Organic Carbon (C-TOT-ORG-LECO-SK, C-TOT-ORG-SK)

Total C and inorganic C are determined on separate samples. The total C is determined by combustion and thermal conductivity detection, while inorganic C is determined by weight lass after addition of hydrochloric acid. Organic C is calculated by the difference between these two determinations.

Reference for Total C:
Nelson, D.W. and Sommers, L.E. 1996. Total Carbon, organic carbon and organic matter. P. 961-1010 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

Reference for Inorganic C:
Loeppert, R.H. and Suarez, D.L. 1996. Gravimetric Method for Loss of Carbon Dioxide. P. 455-456 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

CL-PASTE-COLOR-VA	Soil	Chloride in Soil (Paste) by Colourimetry	Carter-CSSS / APHA 4500-Cl E (modified)

A soil extract produced by the saturated paste extraction procedure is analyzed for chloride by ferricyanide colourimetry.

DX-1613B-HRMS-BU	Soil	Dioxins and Furans HR 1613B	USEPA 1613B

Samples are extracted by Soxhlet. The extracts are prepared using column chromatography, reduced in volume and analyzed by isotope-dilution GC/HRMS

HG-200.2-CVAF-VA	Soil	Mercury in Soil by CVAFS	EPA 200.2/1631E (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAFS.

MET-200.2-CCMS-VA	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample matrix, for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V.

MET-PASTE-ICP-VA	Soil	Metals in Soil (Paste) by ICPOES	Carter-CSSS / EPA 6010B (modified)

A soil extract produced by the saturated paste extraction procedure is analyzed for Sodium, Calcium, and Magnesium by ICPOES as per "Soil Sampling and Methods of Analysis" by M. Carter.

MOISTURE-BU	Soil	% Moisture	ASTM METHOD D2974-00
MOISTURE-VA	Soil	Moisture content	ASTM D2974-00 Method A

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

PAH-SUM-CALC-VA	Soil	Sum of PAH's	CALCULATION

Total PAH represents the sum of all PAH analytes reported for a given sample. Note that regulatory agencies and criteria differ in their definitions of Total PAH in terms of the individual PAH analytes to be included.

PAH-TMB-H/A-MS-VA	Soil	PAH - Rotary Extraction (Hexane/Acetone)	EPA 3570/8270

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3570 & 8270, published by the United States Environmental Protection Agency (EPA). The procedure uses a mechanical shaking technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene. The final extract is analysed by capillary column gas chromatography with mass spectrometric detection (GC/MS). Surrogate recoveries may not be reported in cases where interferences from the sample matrix prevent accurate quantitation. Because the two isomers cannot be readily chromatographically separated, benzo(j)fluoranthene is reported as part of the benzo(b)fluoranthene parameter.

PCB-ED	Soil	PCBs	EPA 3570/8082-GC-ECD
PSA-PIPET-DETAIL-SK	Soil	Particle size - Sieve and Pipette	SSIR-51 METHOD 3.2.1

Particle size distribution is determined by a combination of techniques. Dry sieving is performed for coarse particles, wet sieving for sand particles and the pipette sedimentation method for clay particles.

Reference Information

Reference:

Burt, R. (2009). Soil Survey Field and Laboratory Methods Manual. Soil Survey Investigations Report No. 5. Method 3.2.1.2.2. United States Department of Agriculture Natural Resources Conservation Service.

SAT-PCNT-VA	Soil	Saturation Percentage	Carter-CSSS

Saturation Percentage (SP) is the total volume of water present in a saturated paste (in mL) divided by the dry weight of the sample (in grams), expressed as a percentage, as described in "Soil Sampling and Methods of Analysis" by M. Carter.

WHO1998-FISH-EDL-BU	Soil	WHO1998Toxic Equivalency-Fish ND=EDL	Calculation
WHO1998-FISH-HALF-BU	Soil	WHO1998Toxic Equivalency-Fish ND=1/2EDL	Calculation
WHO1998-FISH-ZERO-BU	Soil	WHO1998Toxic Equivalency-Fish ND=0	Calculation

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
BU	ALS ENVIRONMENTAL - BURLINGTON, ONTARIO, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # N/A

Report To		Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company:	Stantec Consulting Ltd.	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Molly Brewis	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400A-2261 Keating Cross Road	Email 1: molly.brewis@stantec.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saanichton, BC V8M 2A5	Email 2: karen.munro@stantec.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-858-9969 Fax: 250-544-1105	Email 3: stefan.dick@stantec.com	
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information	
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 123220054 task 225.101	
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #:	
Lab Work Order # (lab use only)		ALS Contact: Brent Mack	Sampler: MB & PW

Analysis Request

Please indicate below Filtered, Preserved or both (F, P, F/P)

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-OD-200.2-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU		Archive			Number of Containers
	PCS29 (0-0.2)	21-Jan-16	11:42	SEDIMENT				X	X	X		X					2
	PCS29 (0.2-0.4)	21-Jan-16	11:47	SEDIMENT				X	X	X		X					2
	PCS29 (0.4-0.6)	21-Jan-16	11:50	SEDIMENT				X	X	X		X					2
	PCS29 (0.6-0.8)	21-Jan-16	11:54	SEDIMENT				X	X	X		X					2
	PCS29 (0.8-1.0)	21-Jan-16	11:58	SEDIMENT				X	X	X		X					2
	PCS29 (1.0-1.2)	21-Jan-16	12:02	SEDIMENT										X			2
	SS11 (0-0.075)	21-Jan-16	11:00	SEDIMENT	X	X	X	X	X	X	X						3

L1726336-COFC

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Detailed breakdown of particle size for clay and silt fractions. Dioxins and Furans to be reported with WHO 1998 fish TEQs. Sample SS11 (0-0.075) may have insufficient volume for salinity paste analysis.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Molly Brewis	21-Jan-16	17:00	Jam	22Jan	11:58	3 °C				

Via MR SPEEDY DELIVERY

STANTEC CONSULTING LTD.
ATTN: Molly Brewis
400 - 2261 Keating Cross Road
Saanichton BC V8M 2A5

Date Received: 01-FEB-16
Report Date: 29-FEB-16 15:41 (MT)
Version: FINAL

Client Phone: 250-655-6979

Certificate of Analysis

Lab Work Order #: L1729424

Project P.O. #: NOT SUBMITTED
Job Reference: 123220054 TASK 525.100
C of C Numbers:
Legal Site Desc:

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1729424-1	L1729424-2	L1729424-3		
	Description	Sediment	Sediment	Sediment		
	Sampled Date	26-JAN-16	26-JAN-16	26-JAN-16		
	Sampled Time	13:31	14:10	14:58		
	Client ID	SS04 (0-0.075)	SS17 (0-0.075)	SS19 (0-0.075)		
Grouping	**Analyte**					
SOIL						
Physical Tests	Moisture (%)	49.6	17.9	38.2		
Particle Size	% Gravel (>2mm) (%)	<0.10	6.64	0.79		
	% Sand (2.00mm - 1.00mm) (%)	0.15	7.70	2.81		
	% Sand (1.00mm - 0.50mm) (%)	0.18	15.3	3.75		
	% Sand (0.50mm - 0.25mm) (%)	0.23	33.2	7.64		
	% Sand (0.25mm - 0.125mm) (%)	0.79	23.2	18.0		
	% Sand (0.125mm - 0.063mm) (%)	2.96	5.66	10.7		
	% Silt (0.063mm - 0.0312mm) (%)	16.2	2.91	9.24		
	% Silt (0.0312mm - 0.004mm) (%)	45.9	2.95	25.2		
	% Clay (<4um) (%)	33.6	2.41	21.9		
	Texture	Silt loam	Sand	Loam		
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.57	0.65	1.24		
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	12200	3380	7510		
	% Saturation (%)	62.4	28.6	54.7		
	Sodium (Na) (mg/kg)	5720	2070	4370		
Metals	Arsenic (As) (mg/kg)	10.6	2.36	8.31		
	Cadmium (Cd) (mg/kg)	0.140	<0.050	0.147		
	Chromium (Cr) (mg/kg)	31.6	18.2	21.5		
	Copper (Cu) (mg/kg)	39.1	4.80	25.9		
	Lead (Pb) (mg/kg)	10.5	2.30	8.54		
	Mercury (Hg) (mg/kg)	0.0683	0.0073	0.0489		
	Nickel (Ni) (mg/kg)	29.7	5.69	17.9		
	Zinc (Zn) (mg/kg)	99.2	32.0	68.2		
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050	<0.050	<0.050		
	Acenaphthylene (mg/kg)	<0.050	<0.050	<0.050		
	Anthracene (mg/kg)	<0.050	<0.050	<0.050		
	Benz(a)anthracene (mg/kg)	<0.050	<0.050	<0.050		
	Benzo(a)pyrene (mg/kg)	<0.050	<0.050	<0.050		
	Benzo(b)fluoranthene (mg/kg)	<0.050	<0.050	<0.050		
	Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050	<0.050		
	Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050	<0.050		
	Chrysene (mg/kg)	<0.050	<0.050	<0.050		
	Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050	<0.050		
	Fluoranthene (mg/kg)	<0.050	<0.050	<0.050		
	Fluorene (mg/kg)	<0.050	<0.050	<0.050		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1729424-1	L1729424-2	L1729424-3		
	Description	Sediment	Sediment	Sediment		
	Sampled Date	26-JAN-16	26-JAN-16	26-JAN-16		
	Sampled Time	13:31	14:10	14:58		
	Client ID	SS04 (0-0.075)	SS17 (0-0.075)	SS19 (0-0.075)		
Grouping	**Analyte**					
SOIL						
Polycyclic Aromatic Hydrocarbons	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050	<0.050		
	Naphthalene (mg/kg)	<0.050	<0.050	<0.050		
	Phenanthrene (mg/kg)	<0.050	<0.050	<0.050		
	Pyrene (mg/kg)	<0.050	<0.050	<0.050		
	Surrogate: Acenaphthene d10 (%)	97.5	86.7	90.0		
	Surrogate: Chrysene d12 (%)	109.4	100.7	104.6		
	Surrogate: Naphthalene d8 (%)	96.7	88.6	90.0		
	Surrogate: Phenanthrene d10 (%)	106.9	93.7	101.5		
	Total PAHs (mg/kg)	<0.20	<0.20	<0.20		
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1221 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1232 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1242 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1248 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1254 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1260 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1262 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1268 (mg/kg)	<0.020	<0.020	<0.020		
	Total PCB (BC CSR) (mg/kg)	<0.020	<0.020	<0.020		
	Total Polychlorinated Biphenyls (mg/kg)	<0.020	<0.020	<0.020		
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)	0.589765	0.426063	0.647326		
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)	0.413185	0.213253	0.349376		
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)	0.233305	0.000183	0.044084		
	2,3,7,8-TCDD (pg/g)	<0.11 [U]	<0.15 [U]	<0.20 [U]		
	1,2,3,7,8-PeCDD (pg/g)	<0.089 [U]	<0.10 [U]	<0.16 [U]		
	1,2,3,4,7,8-HxCDD (pg/g)	<0.23 [U]	<0.17 [U]	<0.24 [U]		
	1,2,3,6,7,8-HxCDD (pg/g)	1.07 [J]	<0.15 [U]	0.31 J,R		
	1,2,3,7,8,9-HxCDD (pg/g)	0.35 [J]	<0.16 [U]	<0.23 [U]		
	1,2,3,4,6,7,8-HpCDD (pg/g)	3.30 M,J,R	0.26 M,J,R	1.10 J,R		
	OCDD (pg/g)	24.6	1.83 M,J	7.34 [J]		
	Total-TCDD (pg/g)	0.43	<0.15 [U]	<0.20 [U]		
	Total TCDD # Homologues	2	0	0		
	Total-PeCDD (pg/g)	0.749	<0.10 [U]	<0.16 [U]		
	Total PeCDD # Homologues	3	0	0		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1729424-1	L1729424-2	L1729424-3		
	Description	Sediment	Sediment	Sediment		
	Sampled Date	26-JAN-16	26-JAN-16	26-JAN-16		
	Sampled Time	13:31	14:10	14:58		
	Client ID	SS04 (0-0.075)	SS17 (0-0.075)	SS19 (0-0.075)		
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total-HxCDD (pg/g)	7.22	<0.17 [U]	0.38		
	Total HxCDD # Homologues	3	0	1		
	Total-HpCDD (pg/g)	5.74	0.43	1.81		
	Total HpCDD # Homologues	1	1	1		
	2,3,7,8-TCDF (pg/g)	3.10	<0.13 [U]	0.87		
	1,2,3,7,8-PeCDF (pg/g)	<0.059 M,U	<0.086 [U]	<0.10 [U]		
	2,3,4,7,8-PeCDF (pg/g)	0.107 M,J	<0.080 [U]	<0.098 [U]		
	1,2,3,4,7,8-HxCDF (pg/g)	<0.081 [U]	<0.077 [U]	<0.13 [U]		
	1,2,3,6,7,8-HxCDF (pg/g)	<0.075 [U]	<0.070 [U]	<0.12 [U]		
	1,2,3,7,8,9-HxCDF (pg/g)	<0.12 [U]	<0.11 [U]	<0.20 [U]		
	2,3,4,6,7,8-HxCDF (pg/g)	<0.078 [U]	<0.078 [U]	<0.13 [U]		
	1,2,3,4,6,7,8-HpCDF (pg/g)	0.795 [J]	<0.13 M,U	0.31 M,J,R		
	1,2,3,4,7,8,9-HpCDF (pg/g)	<0.081 [U]	<0.19 [U]	<0.16 [U]		
	OCDF (pg/g)	2.15 [J]	<0.20 M,J,R	0.42 J,R		
	Total-TCDF (pg/g)	5.38	0.21	0.87		
	Total TCDF # Homologues	4	1	1		
	Total-PeCDF (pg/g)	0.698	<0.086 [U]	<0.10 [U]		
	Total PeCDF # Homologues	4	0	0		
	Total-HxCDF (pg/g)	0.40	<0.11 [U]	<0.20 [U]		
	Total HxCDF # Homologues	1	0	0		
	Total-HpCDF (pg/g)	2.09	<0.19 [U]	<0.16 [U]		
	Total HpCDF # Homologues	2	0	0		
	Surrogate: 13C12-2,3,7,8-TCDD (%)	64.0	71.0	66.0		
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)	57.0	55.0	54.0		
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)	67.0	82.0	79.0		
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)	88.0	109.0	103.0		
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)	76.0	87.0	79.0		
	Surrogate: 13C12-OCDD (%)	61.0	71.0	65.0		
	Surrogate: 13C12-2,3,7,8-TCDF (%)	65.0	71.0	65.0		
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)	59.0	63.0	61.0		
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)	58.0	58.0	57.0		
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)	75.0	99.0	95.0		
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)	93.0	117.0	114.0		
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)	85.0	102.0	99.0		
	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)	75.0	90.0	84.0		
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)	76.0	92.0	87.0		
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)	73.0	88.0	80.0		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1729424-1	L1729424-2	L1729424-3		
	Description	Sediment	Sediment	Sediment		
	Sampled Date	26-JAN-16	26-JAN-16	26-JAN-16		
	Sampled Time	13:31	14:10	14:58		
	Client ID	SS04 (0-0.075)	SS17 (0-0.075)	SS19 (0-0.075)		
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)	55.0	64.0	61.0		
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.500	0.000549	0.0889		
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)	0.663	0.190	0.384		
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.793	0.377	0.633		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Arsenic (As)	DUP-H	L1729424-1, -2, -3
Method Blank	1,2,3,7,8-PeCDF	J,R	L1729424-1, -2, -3
Method Blank	OCDD	M,J,R	L1729424-1, -2, -3
Method Blank	OCDF	M,J,R	L1729424-1, -2, -3
Method Blank	1,2,3,6,7,8-HxCDF	M,U	L1729424-1, -2, -3
Method Blank	1,2,3,4,6,7,8-HpCDD	[U]	L1729424-1, -2, -3
Method Blank	1,2,3,4,6,7,8-HpCDF	[U]	L1729424-1, -2, -3
Method Blank	1,2,3,4,7,8,9-HpCDF	[U]	L1729424-1, -2, -3
Method Blank	1,2,3,4,7,8-HxCDD	[U]	L1729424-1, -2, -3
Method Blank	1,2,3,4,7,8-HxCDF	[U]	L1729424-1, -2, -3
Method Blank	1,2,3,6,7,8-HxCDD	[U]	L1729424-1, -2, -3
Method Blank	1,2,3,7,8,9-HxCDD	[U]	L1729424-1, -2, -3
Method Blank	1,2,3,7,8,9-HxCDF	[U]	L1729424-1, -2, -3
Method Blank	1,2,3,7,8-PeCDD	[U]	L1729424-1, -2, -3
Method Blank	2,3,4,6,7,8-HxCDF	[U]	L1729424-1, -2, -3
Method Blank	2,3,4,7,8-PeCDF	[U]	L1729424-1, -2, -3
Method Blank	2,3,7,8-TCDD	[U]	L1729424-1, -2, -3
Method Blank	2,3,7,8-TCDF	[U]	L1729424-1, -2, -3
Method Blank	Total-HpCDD	[U]	L1729424-1, -2, -3
Method Blank	Total-HpCDF	[U]	L1729424-1, -2, -3
Method Blank	Total-HxCDD	[U]	L1729424-1, -2, -3
Method Blank	Total-HxCDF	[U]	L1729424-1, -2, -3
Method Blank	Total-PeCDD	[U]	L1729424-1, -2, -3
Method Blank	Total-PeCDF	[U]	L1729424-1, -2, -3
Method Blank	Total-TCDD	[U]	L1729424-1, -2, -3
Method Blank	Total-TCDF	[U]	L1729424-1, -2, -3

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
J,R	The analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,J	A peak has been manually integrated, and the analyte was detected below the calibrated range but above the EDL.
M,J,R	A peak has been manually integrated, the analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,U	A peak has been manually integrated, and the analyte was not detected above the EDL.
[J]	The analyte was detected below the calibrated range but above the EDL.
[U]	The analyte was not detected above the EDL.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-TOT-ORG-LECO-SK	Soil	Organic Carbon by combustion method	SSSA (1996) p. 973

Total Organic Carbon (C-TOT-ORG-LECO-SK, C-TOT-ORG-SK)

Total C and inorganic C are determined on separate samples. The total C is determined by combustion and thermal conductivity detection, while inorganic C is determined by weight lass after addition of hydrochloric acid. Organic C is calculated by the difference between these two determinations.

Reference for Total C:
Nelson, D.W. and Sommers, L.E. 1996. Total Carbon, organic carbon and organic matter. P. 961-1010 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

Reference for Inorganic C:
Loeppert, R.H. and Suarez, D.L. 1996. Gravimetric Method for Loss of Carbon Dioxide. P. 455-456 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

Reference Information

CL-PASTE-COLOR-VA Soil Chloride in Soil (Paste) by Colourimetry Carter-CSSS / APHA 4500-Cl E (modified)

A soil extract produced by the saturated paste extraction procedure is analyzed for chloride by ferricyanide colourimetry.

DX-1613B-HRMS-BU Soil Dioxins and Furans HR 1613B USEPA 1613B

Samples are extracted by Soxhlet. The extracts are prepared using column chromatography, reduced in volume and analyzed by isotope-dilution GC/HRMS

HG-200.2-CVAF-VA Soil Mercury in Soil by CVAFS EPA 200.2/1631E (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAFS.

MET-200.2-CCMS-VA Soil Metals in Soil by CRC ICPMS EPA 200.2/6020A (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample matrix, for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V.

MET-PASTE-ICP-VA Soil Metals in Soil (Paste) by ICPOES Carter-CSSS / EPA 6010B (modified)

A soil extract produced by the saturated paste extraction procedure is analyzed for Sodium, Calcium, and Magnesium by ICPOES as per "Soil Sampling and Methods of Analysis" by M. Carter.

MOISTURE-VA Soil Moisture content ASTM D2974-00 Method A

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

PAH-SUM-CALC-VA Soil Sum of PAH's CALCULATION

Total PAH represents the sum of all PAH analytes reported for a given sample. Note that regulatory agencies and criteria differ in their definitions of Total PAH in terms of the individual PAH analytes to be included.

PAH-TMB-H/A-MS-VA Soil PAH - Rotary Extraction (Hexane/Acetone) EPA 3570/8270

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3570 & 8270, published by the United States Environmental Protection Agency (EPA). The procedure uses a mechanical shaking technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene. The final extract is analysed by capillary column gas chromatography with mass spectrometric detection (GC/MS). Surrogate recoveries may not be reported in cases where interferences from the sample matrix prevent accurate quantitation. Because the two isomers cannot be readily chromatographically separated, benzo(j)fluoranthene is reported as part of the benzo(b)fluoranthene parameter.

PCB-CSR-SUM-CALC-VA Soil Total PCB (BC CSR) in soil BC Contaminated Sites Regulation

Calculation of Total PCB to meet BC Contaminated Sites Regulation. Total PCB (BC CSR) is the sum of the concentrations of PCB aroclors 1242, 1248, 1254 and 1260. Results below detection limit (DL) are treated as zero. The Total PCB detection limit is equal to the highest of the aroclor detection limits used in the sum.

PCB-SE-ECD-VA Soil PCB by Extraction with GCECD EPA8082, 3630

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3500, 3620, 3630, 3660, 3665 & 8082, published by the United States Environmental Protection Agency (EPA). The procedure involves a solid-liquid extraction of a subsample of the sediment/soil using a mixture of hexane and acetone. Water is added to the extract and the resulting hexane extract undergoes one or more of the following clean-up procedures (if required): florisil clean-up, silica gel clean-up, sulphur clean-up and/or sulphuric acid clean-up. The final extract is analysed by capillary column gas chromatography with electron capture detection (GC/ECD).

PCB-SUM-CALC-VA Soil Total PCBs in soil CALCULATION

Calculation of Total PCB. Total PCB is the sum of the concentrations of PCB aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, and 1268. Results below detection limit (DL) are treated as zero. The Total PCB detection limit is equal to the highest of the aroclor detection limits used in the sum.

PSA-PIPET-DETAIL-SK Soil Particle size - Sieve and Pipette SSIR-51 METHOD 3.2.1

Particle size distribution is determined by a combination of techniques. Dry sieving is performed for coarse particles, wet sieving for sand particles and the pipette sedimentation method for clay particles.

Reference:

Burt, R. (2009). Soil Survey Field and Laboratory Methods Manual. Soil Survey Investigations Report No. 5. Method 3.2.1.2.2. United States Department of Agriculture Natural Resources Conservation Service.

SAT-PCNT-VA Soil Saturation Percentage Carter-CSSS

Saturation Percentage (SP) is the total volume of water present in a saturated paste (in mL) divided by the dry weight of the sample (in grams), expressed as a percentage, as described in "Soil Sampling and Methods of Analysis" by M. Carter.

Reference Information

WHO1998-FISH-EDL-BU	Soil	WHO1998Toxic Equivalency-Fish ND=EDL	Calculation
WHO1998-FISH-HALF-BU	Soil	WHO1998Toxic Equivalency-Fish ND=1/2EDL	Calculation
WHO1998-FISH-ZERO-BU	Soil	WHO1998Toxic Equivalency-Fish ND=0	Calculation

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # N/A

Report To		Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company:	Stantec Consulting Ltd.	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Molly Brewis	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400A-2261 Keating Cross Road	Email 1: molly.brewis@stantec.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saanichton, BC V8M 2A5	Email 2: karen.munro@stantec.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-858-9969 Fax: 250-544-1105	Email 3: stefan.dick@stantec.com	
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information	Analysis Request
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 123220054 task 225.101	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:		PO /.AFE:	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #:	
Lab Work Order # (lab use only)		ALS Contact: Brent Mack	Sampler: BT and SW

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-OD-200.2-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU		Archive			Number of Containers
	SS-04 (0 - 0.075 m)	26-Jan-16	13:31	SEDIMENT	X	X	X	X	X	X	X	X					4
	SS-17 (0 - 0.075 m)	26-Jan-16	14:10	SEDIMENT	X	X	X	X	X	X	X	X					4
	SS-19 (0 - 0.075 m)	26-Jan-16	14:58	SEDIMENT	X	X	X	X	X	X	X	X					4

L1729424-COFC

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Detailed breakdown of particle size for clay and silt fractions. Dioxins and Furans to be reported with WHO 1998 fish TEQs. Sample SS17 (0-0.075) may have insufficient volume for salinity paste analysis.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Sandra Warren	27-Jan-16	17:00	Jean	Feb1	15:23	14 °C				

STANTEC CONSULTING LTD.
ATTN: Molly Brewis
400 - 2261 Keating Cross Road
Saanichton BC V8M 2A5

Date Received: 18-JAN-16
Report Date: 07-MAR-16 15:23 (MT)
Version: FINAL REV. 2

Client Phone: 250-655-6979

Certificate of Analysis

Lab Work Order #: L1724928

Project P.O. #: NOT SUBMITTED
Job Reference: 123220054 TASK 225.101
C of C Numbers:
Legal Site Desc:

Comments: 7-MAR-2016 This report replaces the previous version and contains additional analyses, as requested.

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1724928-1	L1724928-2	L1724928-3	L1724928-4	L1724928-5
Description	Sediment	Sediment	Sediment	Sediment	Sediment
Sampled Date	15-JAN-16	15-JAN-16	15-JAN-16	15-JAN-16	15-JAN-16
Sampled Time	13:05	15:10	15:15	15:30	15:40
Client ID	PCL15(0-0.5)	PCL07(0-0.5)	PCL07(0.5-1.0)	PCL07(1.0-1.5)	PCL07(1.5-2.0)
Grouping / **Analyte**					
SOIL					
Physical Tests / % Moisture (%)					
Moisture (%)	34.8	36.6	30.4	31.4	29.0
Particle Size / % Gravel (>2mm) (%)	2.86	0.24	0.28	0.15	0.91
% Sand (2.00mm - 1.00mm) (%)	9.15	0.53	0.71	0.76	1.21
% Sand (1.00mm - 0.50mm) (%)	12.5	0.37	0.78	0.73	0.94
% Sand (0.50mm - 0.25mm) (%)	7.89	0.65	1.50	15.5	1.33
% Sand (0.25mm - 0.125mm) (%)	5.52	10.1	16.6	23.2	26.7
% Sand (0.125mm - 0.063mm) (%)	6.25	12.1	16.9	22.4	21.9
% Silt (0.063mm - 0.0312mm) (%)	11.5	16.0	14.9	8.74	12.6
% Silt (0.0312mm - 0.004mm) (%)	23.8	33.9	26.7	13.0	18.3
% Clay (<4um) (%)	20.5	26.0	21.7	15.6	16.1
Texture	Loam	Silt loam	Loam	Sandy loam	Sandy loam
Organic / Inorganic Carbon / Total Organic Carbon (%)	1.98	1.79	1.39	1.41	
Saturated Paste Extractables / Chloride (Cl) (mg/kg)	5760	8550	5520	5420	
% Saturation (%)	49.9	65.2	52.1	45.3	
Sodium (Na) (mg/kg)	2990	4850	2870	2690	
Metals / Arsenic (As) (mg/kg)	8.21	12.8	10.2	9.46	8.85
Cadmium (Cd) (mg/kg)	0.200	0.172	0.202	0.212	0.216
Chromium (Cr) (mg/kg)	20.1	26.9	22.9	20.6	19.5
Copper (Cu) (mg/kg)	21.7	34.6	24.3	20.6	17.6
Lead (Pb) (mg/kg)	4.35	7.88	5.91	4.59	4.41
Mercury (Hg) (mg/kg)	0.0307	0.0589	0.0355	0.0293	0.483
Nickel (Ni) (mg/kg)	18.3	23.5	19.9	16.5	14.8
Zinc (Zn) (mg/kg)	63.2	85.0	68.4	62.7	54.9
Polycyclic Aromatic Hydrocarbons / Acenaphthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
Acenaphthylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
Anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
Benz(a)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
Benzo(a)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
Benzo(b)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
Chrysene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
Fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1724928-6	L1724928-7	L1724928-8	L1724928-9	L1724928-10
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	15-JAN-16	16-JAN-16	16-JAN-16	16-JAN-16	16-JAN-16
	Sampled Time	15:50	09:50	11:35	11:42	11:50
	Client ID	PCL07(2.0-2.5)	PCL03(0-0.5)	PCL01(0-0.5)	PCL01(0.5-1.0)	PCL01(1.0-1.5)
Grouping	**Analyte**					
SOIL						
Physical Tests	% Moisture (%)					
	Moisture (%)	26.8	29.8	26.3	27.2	26.6
Particle Size	% Gravel (>2mm) (%)	1.15	3.24	6.69	7.94	7.41
	% Sand (2.00mm - 1.00mm) (%)	1.14	6.45	12.6	15.6	8.67
	% Sand (1.00mm - 0.50mm) (%)	0.94	5.87	12.1	12.7	9.63
	% Sand (0.50mm - 0.25mm) (%)	2.23	10.0	17.2	15.3	15.1
	% Sand (0.25mm - 0.125mm) (%)	43.4	30.5	26.8	28.0	37.8
	% Sand (0.125mm - 0.063mm) (%)	22.5	9.40	4.84	5.03	5.59
	% Silt (0.063mm - 0.0312mm) (%)	9.02	7.47	3.96	3.00	3.24
	% Silt (0.0312mm - 0.004mm) (%)	10.1	14.3	8.38	5.83	5.92
	% Clay (<4um) (%)	9.51	12.8	7.41	6.71	6.65
	Texture	Sandy loam	Sandy loam	Loamy sand	Loamy sand	Loamy sand
Organic / Inorganic Carbon	Total Organic Carbon (%)		1.19	1.91	1.07	1.77
Saturated Paste Extractables	Chloride (Cl) (mg/kg)		4210	4200	4000	5100
	% Saturation (%)		36.9	33.9	33.9	34.4
	Sodium (Na) (mg/kg)		2130	2080	2040	2740
Metals	Arsenic (As) (mg/kg)	6.83	8.74	4.16	3.46	4.14
	Cadmium (Cd) (mg/kg)	0.189	0.198	0.186	0.194	0.205
	Chromium (Cr) (mg/kg)	15.7	15.9	10.9	9.26	9.52
	Copper (Cu) (mg/kg)	11.8	15.1	9.81	7.69	7.07
	Lead (Pb) (mg/kg)	3.29	3.98	3.36	2.35	2.20
	Mercury (Hg) (mg/kg)	0.606	0.0248	0.0174	0.0132	0.0116
	Nickel (Ni) (mg/kg)	10.8	12.6	7.66	6.35	7.00
	Zinc (Zn) (mg/kg)	40.0	47.0	28.7	23.5	24.7
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)		<0.050	<0.050	<0.050	<0.050
	Acenaphthylene (mg/kg)		<0.050	<0.050	<0.050	<0.050
	Anthracene (mg/kg)		<0.050	<0.050	<0.050	<0.050
	Benz(a)anthracene (mg/kg)		<0.050	<0.050	<0.050	<0.050
	Benzo(a)pyrene (mg/kg)		<0.050	<0.050	<0.050	<0.050
	Benzo(b)fluoranthene (mg/kg)		<0.050	<0.050	<0.050	<0.050
	Benzo(g,h,i)perylene (mg/kg)		<0.050	<0.050	<0.050	<0.050
	Benzo(k)fluoranthene (mg/kg)		<0.050	<0.050	<0.050	<0.050
	Chrysene (mg/kg)		<0.050	<0.050	<0.050	<0.050
	Dibenz(a,h)anthracene (mg/kg)		<0.050	<0.050	<0.050	<0.050
	Fluoranthene (mg/kg)		<0.050	<0.050	<0.050	<0.050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1724928-11	L1724928-12	L1724928-13	L1724928-14	L1724928-15
Description	Sediment	Sediment	Sediment	Sediment	Sediment
Sampled Date	16-JAN-16	16-JAN-16	16-JAN-16	16-JAN-16	16-JAN-16
Sampled Time	12:00	14:56	15:05	15:12	15:18
Client ID	PCL01(1.5-2.0)	PCS01(0-0.2)	PCS01(0.2-0.4)	PCS01(0.4-0.6)	PCS01(0.6-0.8)
Grouping / **Analyte**					
SOIL					
Physical Tests % Moisture (%)		28.7	25.5	23.7	24.7
Moisture (%)	24.6				
Particle Size % Gravel (>2mm) (%)	7.99	4.51	6.61	6.70	7.58
% Sand (2.00mm - 1.00mm) (%)	12.5	6.74	6.99	11.8	9.71
% Sand (1.00mm - 0.50mm) (%)	12.9	8.46	9.65	8.37	7.99
% Sand (0.50mm - 0.25mm) (%)	18.6	16.7	16.3	13.9	12.8
% Sand (0.25mm - 0.125mm) (%)	29.9	31.6	33.2	32.8	34.9
% Sand (0.125mm - 0.063mm) (%)	4.45	5.66	6.11	6.12	6.18
% Silt (0.063mm - 0.0312mm) (%)	2.26	5.11	4.64	4.26	4.51
% Silt (0.0312mm - 0.004mm) (%)	4.81	11.3	8.36	8.05	8.57
% Clay (<4um) (%)	6.73	9.93	8.19	8.02	7.75
Texture	Loamy sand	Sandy loam	Loamy sand	Loamy sand	Loamy sand
Organic / Inorganic Carbon Total Organic Carbon (%)		1.47	2.11	0.95	1.12
Saturated Paste Extractables Chloride (Cl) (mg/kg)					
% Saturation (%)					
Sodium (Na) (mg/kg)					
Metals Arsenic (As) (mg/kg)					
Cadmium (Cd) (mg/kg)					
Chromium (Cr) (mg/kg)					
Copper (Cu) (mg/kg)					
Lead (Pb) (mg/kg)					
Mercury (Hg) (mg/kg)					
Nickel (Ni) (mg/kg)					
Zinc (Zn) (mg/kg)					
Polycyclic Aromatic Hydrocarbons Acenaphthene (mg/kg)					
Acenaphthylene (mg/kg)					
Anthracene (mg/kg)					
Benz(a)anthracene (mg/kg)					
Benzo(a)pyrene (mg/kg)					
Benzo(b)fluoranthene (mg/kg)					
Benzo(g,h,i)perylene (mg/kg)					
Benzo(k)fluoranthene (mg/kg)					
Chrysene (mg/kg)					
Dibenz(a,h)anthracene (mg/kg)					
Fluoranthene (mg/kg)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1724928-16				
	Description	Sediment				
	Sampled Date	16-JAN-16				
	Sampled Time	15:21				
	Client ID	PCS01(0.8-1.0)				
Grouping	**Analyte**					
SOIL						
Physical Tests	% Moisture (%)	24.5				
	Moisture (%)					
Particle Size	% Gravel (>2mm) (%)	7.74				
	% Sand (2.00mm - 1.00mm) (%)	6.64				
	% Sand (1.00mm - 0.50mm) (%)	8.17				
	% Sand (0.50mm - 0.25mm) (%)	13.5				
	% Sand (0.25mm - 0.125mm) (%)	35.7				
	% Sand (0.125mm - 0.063mm) (%)	6.65				
	% Silt (0.063mm - 0.0312mm) (%)	4.90				
	% Silt (0.0312mm - 0.004mm) (%)	8.70				
	% Clay (<4um) (%)	7.99				
	Texture	Loamy sand				
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.26				
Saturated Paste Extractables	Chloride (Cl) (mg/kg)					
	% Saturation (%)					
	Sodium (Na) (mg/kg)					
Metals	Arsenic (As) (mg/kg)					
	Cadmium (Cd) (mg/kg)					
	Chromium (Cr) (mg/kg)					
	Copper (Cu) (mg/kg)					
	Lead (Pb) (mg/kg)					
	Mercury (Hg) (mg/kg)					
	Nickel (Ni) (mg/kg)					
	Zinc (Zn) (mg/kg)					
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)					
	Acenaphthylene (mg/kg)					
	Anthracene (mg/kg)					
	Benz(a)anthracene (mg/kg)					
	Benzo(a)pyrene (mg/kg)					
	Benzo(b)fluoranthene (mg/kg)					
	Benzo(g,h,i)perylene (mg/kg)					
	Benzo(k)fluoranthene (mg/kg)					
	Chrysene (mg/kg)					
	Dibenz(a,h)anthracene (mg/kg)					
	Fluoranthene (mg/kg)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1724928-1	L1724928-2	L1724928-3	L1724928-4	L1724928-5
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	15-JAN-16	15-JAN-16	15-JAN-16	15-JAN-16	15-JAN-16
	Sampled Time	13:05	15:10	15:15	15:30	15:40
	Client ID	PCL15(0-0.5)	PCL07(0-0.5)	PCL07(0.5-1.0)	PCL07(1.0-1.5)	PCL07(1.5-2.0)
Grouping	**Analyte**					
SOIL						
Polycyclic Aromatic Hydrocarbons	Fluorene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Naphthalene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Phenanthrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Surrogate: Acenaphthene d10 (%)	81.2	89.0	87.2	86.4	
	Surrogate: Chrysene d12 (%)	93.6	97.2	94.1	97.2	
	Surrogate: Naphthalene d8 (%)	63.1	87.3	42.8 SURR-ND	84.4	
	Surrogate: Phenanthrene d10 (%)	89.0	97.6	92.0	93.9	
	Total PAHs (mg/kg)	<0.20	<0.20	<0.20	<0.20	
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1221 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1232 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1242 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1248 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1254 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1260 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1262 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1268 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	Total PCB (BC CSR) (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	Total Polychlorinated Biphenyls (mg/kg)	<0.020	<0.020	<0.020	<0.020	
Dioxins and Furans	WHO1998 Fish Lower Bound TEQ (ND=0) (pg/g)					
	WHO1998 Fish Mid Bound TEQ (ND=1/2EDL) (pg/g)					
	WHO1998 Fish Upper Bound TEQ (ND=EDL) (pg/g)					
	2,3,7,8-TCDD (pg/g)					
	1,2,3,7,8-PeCDD (pg/g)					
	1,2,3,4,7,8-HxCDD (pg/g)					
	1,2,3,6,7,8-HxCDD (pg/g)					
	1,2,3,7,8,9-HxCDD (pg/g)					
	1,2,3,4,6,7,8-HpCDD (pg/g)					
	OCDD (pg/g)					
	Total-TCDD (pg/g)					
	Total TCDD # Homologues					
	Total-PeCDD (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1724928-6	L1724928-7	L1724928-8	L1724928-9	L1724928-10
Description	Sediment	Sediment	Sediment	Sediment	Sediment
Sampled Date	15-JAN-16	16-JAN-16	16-JAN-16	16-JAN-16	16-JAN-16
Sampled Time	15:50	09:50	11:35	11:42	11:50
Client ID	PCL07(2.0-2.5)	PCL03(0-0.5)	PCL01(0-0.5)	PCL01(0.5-1.0)	PCL01(1.0-1.5)
Grouping / **Analyte**					
SOIL					
Polycyclic Aromatic Hydrocarbons					
Fluorene (mg/kg)		<0.050	<0.050	<0.050	<0.050
Indeno(1,2,3-c,d)pyrene (mg/kg)		<0.050	<0.050	<0.050	<0.050
Naphthalene (mg/kg)		<0.050	<0.050	<0.050	<0.050
Phenanthrene (mg/kg)		<0.050	<0.050	<0.050	<0.050
Pyrene (mg/kg)		<0.050	<0.050	<0.050	<0.050
Surrogate: Acenaphthene d10 (%)		83.1	91.2	87.0	82.4
Surrogate: Chrysene d12 (%)		92.1	97.2	98.3	93.1
Surrogate: Naphthalene d8 (%)		83.4	89.1	85.6	84.4
Surrogate: Phenanthrene d10 (%)		89.9	95.1	95.0	89.9
Total PAHs (mg/kg)		<0.20	<0.20	<0.20	<0.20
Polychlorinated Biphenyls					
PCB-1016 (mg/kg)		<0.020	<0.020	<0.020	<0.020
PCB-1221 (mg/kg)		<0.020	<0.020	<0.020	<0.020
PCB-1232 (mg/kg)		<0.020	<0.020	<0.020	<0.020
PCB-1242 (mg/kg)		<0.020	<0.020	<0.020	<0.020
PCB-1248 (mg/kg)		<0.020	<0.020	<0.020	<0.020
PCB-1254 (mg/kg)		<0.020	<0.020	<0.020	<0.020
PCB-1260 (mg/kg)		<0.020	<0.020	<0.020	<0.020
PCB-1262 (mg/kg)		<0.020	<0.020	<0.020	<0.020
PCB-1268 (mg/kg)		<0.020	<0.020	<0.020	<0.020
Total PCB (BC CSR) (mg/kg)		<0.020	<0.020	<0.020	<0.020
Total Polychlorinated Biphenyls (mg/kg)		<0.020	<0.020	<0.020	<0.020
Dioxins and Furans					
WHO1998 Fish Lower Bound TEQ (ND=0) (pg/g)					
WHO1998 Fish Mid Bound TEQ (ND=1/2EDL) (pg/g)					
WHO1998 Fish Upper Bound TEQ (ND=EDL) (pg/g)					
2,3,7,8-TCDD (pg/g)					
1,2,3,7,8-PeCDD (pg/g)					
1,2,3,4,7,8-HxCDD (pg/g)					
1,2,3,6,7,8-HxCDD (pg/g)					
1,2,3,7,8,9-HxCDD (pg/g)					
1,2,3,4,6,7,8-HpCDD (pg/g)					
OCDD (pg/g)					
Total-TCDD (pg/g)					
Total TCDD # Homologues					
Total-PeCDD (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1724928-11	L1724928-12	L1724928-13	L1724928-14	L1724928-15
Description	Sediment	Sediment	Sediment	Sediment	Sediment
Sampled Date	16-JAN-16	16-JAN-16	16-JAN-16	16-JAN-16	16-JAN-16
Sampled Time	12:00	14:56	15:05	15:12	15:18
Client ID	PCL01(1.5-2.0)	PCS01(0-0.2)	PCS01(0.2-0.4)	PCS01(0.4-0.6)	PCS01(0.6-0.8)
Grouping / **Analyte**					
SOIL					
Polycyclic Aromatic Hydrocarbons					
Fluorene (mg/kg)					
Indeno(1,2,3-c,d)pyrene (mg/kg)					
Naphthalene (mg/kg)					
Phenanthrene (mg/kg)					
Pyrene (mg/kg)					
Surrogate: Acenaphthene d10 (%)					
Surrogate: Chrysene d12 (%)					
Surrogate: Naphthalene d8 (%)					
Surrogate: Phenanthrene d10 (%)					
Total PAHs (mg/kg)					
Polychlorinated Biphenyls					
PCB-1016 (mg/kg)					
PCB-1221 (mg/kg)					
PCB-1232 (mg/kg)					
PCB-1242 (mg/kg)					
PCB-1248 (mg/kg)					
PCB-1254 (mg/kg)					
PCB-1260 (mg/kg)					
PCB-1262 (mg/kg)					
PCB-1268 (mg/kg)					
Total PCB (BC CSR) (mg/kg)					
Total Polychlorinated Biphenyls (mg/kg)					
Dioxins and Furans					
WHO1998 Fish Lower Bound TEQ (ND=0) (pg/g)		0.092137	0.0352196	0.001059	0.0000964
WHO1998 Fish Mid Bound TEQ (ND=1/2EDL) (pg/g)		0.293047	0.1289146	0.0833606	0.0799977
WHO1998 Fish Upper Bound TEQ (ND=EDL) (pg/g)		0.351207	0.2209096	0.1579656	0.15986
2,3,7,8-TCDD (pg/g)		<0.048 [U]	<0.046 [U]	<0.046 [U]	<0.051 [U]
1,2,3,7,8-PeCDD (pg/g)		0.110 J,R	<0.063 [U]	<0.036 [U]	<0.044 [U]
1,2,3,4,7,8-HxCDD (pg/g)		<0.079 [U]	<0.093 [U]	<0.081 [U]	<0.080 [U]
1,2,3,6,7,8-HxCDD (pg/g)		0.676 M,J	0.170 M,J,R	<0.075 M,U	<0.071 [U]
1,2,3,7,8,9-HxCDD (pg/g)		0.250 J,R	<0.084 [U]	<0.077 [U]	<0.075 [U]
1,2,3,4,6,7,8-HpCDD (pg/g)		2.23 [J]	0.621 M,J	0.190 M,J,R	0.096 M,J
OCDD (pg/g)		15.4	3.17 [J]	1.02 M,J	0.390 M,J,R
Total-TCDD (pg/g)		0.130	<0.046 [U]	<0.046 [U]	<0.051 [U]
Total TCDD # Homologues		1	0	0	0
Total-PeCDD (pg/g)		0.178	<0.063 [U]	<0.036 [U]	<0.044 [U]

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1724928-16				
	Description	Sediment				
	Sampled Date	16-JAN-16				
	Sampled Time	15:21				
	Client ID	PCS01(0.8-1.0)				
Grouping	**Analyte**					
SOIL						
Polycyclic Aromatic Hydrocarbons	Fluorene (mg/kg)					
	Indeno(1,2,3-c,d)pyrene (mg/kg)					
	Naphthalene (mg/kg)					
	Phenanthrene (mg/kg)					
	Pyrene (mg/kg)					
	Surrogate: Acenaphthene d10 (%)					
	Surrogate: Chrysene d12 (%)					
	Surrogate: Naphthalene d8 (%)					
	Surrogate: Phenanthrene d10 (%)					
	Total PAHs (mg/kg)					
Polychlorinated Biphenyls	PCB-1016 (mg/kg)					
	PCB-1221 (mg/kg)					
	PCB-1232 (mg/kg)					
	PCB-1242 (mg/kg)					
	PCB-1248 (mg/kg)					
	PCB-1254 (mg/kg)					
	PCB-1260 (mg/kg)					
	PCB-1262 (mg/kg)					
	PCB-1268 (mg/kg)					
	Total PCB (BC CSR) (mg/kg)					
	Total Polychlorinated Biphenyls (mg/kg)					
Dioxins and Furans	WHO1998 Fish Lower Bound TEQ (ND=0) (pg/g)	0.0005177				
	WHO1998 Fish Mid Bound TEQ (ND=1/2EDL) (pg/g)	0.0839192				
	WHO1998 Fish Upper Bound TEQ (ND=EDL) (pg/g)	0.1673142				
	2,3,7,8-TCDD (pg/g)	<0.049 [U]				
	1,2,3,7,8-PeCDD (pg/g)	<0.056 [U]				
	1,2,3,4,7,8-HxCDD (pg/g)	<0.073 [U]				
	1,2,3,6,7,8-HxCDD (pg/g)	<0.064 [U]				
	1,2,3,7,8,9-HxCDD (pg/g)	<0.067 [U]				
	1,2,3,4,6,7,8-HpCDD (pg/g)	0.073 [J]				
	OCDD (pg/g)	0.295 M,J,B				
	Total-TCDD (pg/g)	<0.049 [U]				
	Total TCDD # Homologues	0				
	Total-PeCDD (pg/g)	<0.056 [U]				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1724928-1	L1724928-2	L1724928-3	L1724928-4	L1724928-5
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	15-JAN-16	15-JAN-16	15-JAN-16	15-JAN-16	15-JAN-16
	Sampled Time	13:05	15:10	15:15	15:30	15:40
	Client ID	PCL15(0-0.5)	PCL07(0-0.5)	PCL07(0.5-1.0)	PCL07(1.0-1.5)	PCL07(1.5-2.0)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total PeCDD # Homologues					
	Total-HxCDD (pg/g)					
	Total HxCDD # Homologues					
	Total-HpCDD (pg/g)					
	Total HpCDD # Homologues					
	2,3,7,8-TCDF (pg/g)					
	1,2,3,7,8-PeCDF (pg/g)					
	2,3,4,7,8-PeCDF (pg/g)					
	1,2,3,4,7,8-HxCDF (pg/g)					
	1,2,3,6,7,8-HxCDF (pg/g)					
	1,2,3,7,8,9-HxCDF (pg/g)					
	2,3,4,6,7,8-HxCDF (pg/g)					
	1,2,3,4,6,7,8-HpCDF (pg/g)					
	1,2,3,4,7,8,9-HpCDF (pg/g)					
	OCDF (pg/g)					
	Total-TCDF (pg/g)					
	Total TCDF # Homologues					
	Total-PeCDF (pg/g)					
	Total PeCDF # Homologues					
	Total-HxCDF (pg/g)					
	Total HxCDF # Homologues					
	Total-HpCDF (pg/g)					
	Total HpCDF # Homologues					
	Surrogate: 13C12-2,3,7,8-TCDD (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)					
	Surrogate: 13C12-OCDD (%)					
	Surrogate: 13C12-2,3,7,8-TCDF (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)					
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)					
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1724928-6	L1724928-7	L1724928-8	L1724928-9	L1724928-10
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	15-JAN-16	16-JAN-16	16-JAN-16	16-JAN-16	16-JAN-16
	Sampled Time	15:50	09:50	11:35	11:42	11:50
	Client ID	PCL07(2.0-2.5)	PCL03(0-0.5)	PCL01(0-0.5)	PCL01(0.5-1.0)	PCL01(1.0-1.5)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total PeCDD # Homologues					
	Total-HxCDD (pg/g)					
	Total HxCDD # Homologues					
	Total-HpCDD (pg/g)					
	Total HpCDD # Homologues					
	2,3,7,8-TCDF (pg/g)					
	1,2,3,7,8-PeCDF (pg/g)					
	2,3,4,7,8-PeCDF (pg/g)					
	1,2,3,4,7,8-HxCDF (pg/g)					
	1,2,3,6,7,8-HxCDF (pg/g)					
	1,2,3,7,8,9-HxCDF (pg/g)					
	2,3,4,6,7,8-HxCDF (pg/g)					
	1,2,3,4,6,7,8-HpCDF (pg/g)					
	1,2,3,4,7,8,9-HpCDF (pg/g)					
	OCDF (pg/g)					
	Total-TCDF (pg/g)					
	Total TCDF # Homologues					
	Total-PeCDF (pg/g)					
	Total PeCDF # Homologues					
	Total-HxCDF (pg/g)					
	Total HxCDF # Homologues					
	Total-HpCDF (pg/g)					
	Total HpCDF # Homologues					
	Surrogate: 13C12-2,3,7,8-TCDD (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)					
	Surrogate: 13C12-OCDD (%)					
	Surrogate: 13C12-2,3,7,8-TCDF (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)					
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)					
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1724928-11	L1724928-12	L1724928-13	L1724928-14	L1724928-15
Description	Sediment	Sediment	Sediment	Sediment	Sediment
Sampled Date	16-JAN-16	16-JAN-16	16-JAN-16	16-JAN-16	16-JAN-16
Sampled Time	12:00	14:56	15:05	15:12	15:18
Client ID	PCL01(1.5-2.0)	PCS01(0-0.2)	PCS01(0.2-0.4)	PCS01(0.4-0.6)	PCS01(0.6-0.8)
Grouping / **Analyte**					
SOIL					
Dioxins and Furans					
Total PeCDD # Homologues		1	0	0	0
Total-HxCDD (pg/g)		5.16	0.306	0.419	0.177
Total HxCDD # Homologues		3	1	2	1
Total-HpCDD (pg/g)		6.52	1.69	<0.062 [U]	0.096
Total HpCDD # Homologues		2	2	0	1
2,3,7,8-TCDF (pg/g)		1.63	0.656 [J]	0.150 M,J,R	<0.037 M,U
1,2,3,7,8-PeCDF (pg/g)		0.039 J,R	<0.030 [U]	<0.023 [U]	<0.023 [U]
2,3,4,7,8-PeCDF (pg/g)		0.049 J,R	<0.026 [U]	<0.021 [U]	<0.021 [U]
1,2,3,4,7,8-HxCDF (pg/g)		<0.065 [U]	<0.028 [U]	<0.029 [U]	<0.021 [U]
1,2,3,6,7,8-HxCDF (pg/g)		<0.060 [U]	<0.027 [U]	<0.026 [U]	<0.018 [U]
1,2,3,7,8,9-HxCDF (pg/g)		<0.099 [U]	<0.046 [U]	<0.049 [U]	<0.034 [U]
2,3,4,6,7,8-HxCDF (pg/g)		<0.058 [U]	<0.026 [U]	<0.025 [U]	<0.018 [U]
1,2,3,4,6,7,8-HpCDF (pg/g)		0.380 M,J,R	0.145 M,J	0.096 [J]	<0.025 [U]
1,2,3,4,7,8,9-HpCDF (pg/g)		<0.062 [U]	<0.045 [U]	<0.064 [U]	<0.041 [U]
OCDF (pg/g)		1.07 [J]	0.316 M,J	0.066 M,J,R	<0.046 M,U
Total-TCDF (pg/g)		2.89	0.880	0.119	<0.037 [U]
Total TCDF # Homologues		4	2	1	0
Total-PeCDF (pg/g)		0.048	<0.030 [U]	<0.023 [U]	<0.023 [U]
Total PeCDF # Homologues		1	0	0	0
Total-HxCDF (pg/g)		<0.099 [U]	0.071	<0.049 [U]	<0.034 [U]
Total HxCDF # Homologues		0	1	0	0
Total-HpCDF (pg/g)		0.865	0.145	0.096	<0.041 [U]
Total HpCDF # Homologues		1	1	1	0
Surrogate: 13C12-2,3,7,8-TCDD (%)		64.0	65.0	61.0	64.0
Surrogate: 13C12-1,2,3,7,8-PeCDD (%)		55.0	56.0	56.0	55.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)		73.0	71.0	69.0	66.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)		91.0	91.0	88.0	90.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)		76.0	74.0	70.0	70.0
Surrogate: 13C12-OCDD (%)		68.0	68.0	66.0	69.0
Surrogate: 13C12-2,3,7,8-TCDF (%)		64.0	64.0	57.0	64.0
Surrogate: 13C12-1,2,3,7,8-PeCDF (%)		60.0	60.0	59.0	60.0
Surrogate: 13C12-2,3,4,7,8-PeCDF (%)		58.0	61.0	59.0	56.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)		73.0	75.0	68.0	68.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)		94.0	94.0	91.0	89.0
Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)		85.0	85.0	79.0	79.0
Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)		75.0	73.0	68.0	70.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)		77.0	78.0	74.0	77.0

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1724928-16				
	Description	Sediment				
	Sampled Date	16-JAN-16				
	Sampled Time	15:21				
	Client ID	PCS01(0.8-1.0)				
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total PeCDD # Homologues	0				
	Total-HxCDD (pg/g)	<0.073 [U]				
	Total HxCDD # Homologues	0				
	Total-HpCDD (pg/g)	0.073				
	Total HpCDD # Homologues	1				
	2,3,7,8-TCDF (pg/g)	<0.040 [U]				
	1,2,3,7,8-PeCDF (pg/g)	<0.025 [U]				
	2,3,4,7,8-PeCDF (pg/g)	<0.021 [U]				
	1,2,3,4,7,8-HxCDF (pg/g)	<0.022 [U]				
	1,2,3,6,7,8-HxCDF (pg/g)	<0.020 [U]				
	1,2,3,7,8,9-HxCDF (pg/g)	<0.035 [U]				
	2,3,4,6,7,8-HxCDF (pg/g)	<0.020 [U]				
	1,2,3,4,6,7,8-HpCDF (pg/g)	0.042 M,J				
	1,2,3,4,7,8,9-HpCDF (pg/g)	<0.053 [U]				
	OCDF (pg/g)	0.065 M,J,R				
	Total-TCDF (pg/g)	0.377				
	Total TCDF # Homologues	2				
	Total-PeCDF (pg/g)	<0.025 [U]				
	Total PeCDF # Homologues	0				
	Total-HxCDF (pg/g)	<0.035 [U]				
	Total HxCDF # Homologues	0				
	Total-HpCDF (pg/g)	<0.053 [U]				
	Total HpCDF # Homologues	0				
	Surrogate: 13C12-2,3,7,8-TCDD (%)	65.0				
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)	54.0				
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)	70.0				
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)	89.0				
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)	73.0				
	Surrogate: 13C12-OCDD (%)	67.0				
	Surrogate: 13C12-2,3,7,8-TCDF (%)	65.0				
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)	60.0				
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)	56.0				
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)	70.0				
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)	92.0				
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)	80.0				
	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)	70.0				
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)	75.0				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1724928-1	L1724928-2	L1724928-3	L1724928-4	L1724928-5
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	15-JAN-16	15-JAN-16	15-JAN-16	15-JAN-16	15-JAN-16
	Sampled Time	13:05	15:10	15:15	15:30	15:40
	Client ID	PCL15(0-0.5)	PCL07(0-0.5)	PCL07(0.5-1.0)	PCL07(1.0-1.5)	PCL07(1.5-2.0)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)					
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)					
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)					
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)					
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1724928-6	L1724928-7	L1724928-8	L1724928-9	L1724928-10
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	15-JAN-16	16-JAN-16	16-JAN-16	16-JAN-16	16-JAN-16
	Sampled Time	15:50	09:50	11:35	11:42	11:50
	Client ID	PCL07(2.0-2.5)	PCL03(0-0.5)	PCL01(0-0.5)	PCL01(0.5-1.0)	PCL01(1.0-1.5)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)					
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)					
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)					
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)					
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1724928-11	L1724928-12	L1724928-13	L1724928-14	L1724928-15
Description	Sediment	Sediment	Sediment	Sediment	Sediment
Sampled Date	16-JAN-16	16-JAN-16	16-JAN-16	16-JAN-16	16-JAN-16
Sampled Time	12:00	14:56	15:05	15:12	15:18
Client ID	PCL01(1.5-2.0)	PCS01(0-0.2)	PCS01(0.2-0.4)	PCS01(0.4-0.6)	PCS01(0.6-0.8)
Grouping / **Analyte**					
SOIL					
Dioxins and Furans — Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)		70.0	71.0	68.0	71.0
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)		57.0	54.0	52.0	55.0
Toxic Equivalency — Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)		0.258	0.0743	0.00126	0.000964
Mid Point PCDD/F TEQ (WHO 2005) (pg/g)		0.455	0.166	0.0811	0.0701
Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)		0.497	0.240	0.144	0.139

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1724928-16				
	Description	Sediment				
	Sampled Date	16-JAN-16				
	Sampled Time	15:21				
	Client ID	PCS01(0.8-1.0)				
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)	70.0				
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)	54.0				
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.00124				
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)	0.0746				
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.148				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Total-TCDD	G	L1724928-12, -13, -14, -15, -16
Comments:	The replication for total TCDD is marginally above the control limit. Results for 2,3,7,8-TCDD and TEQ values are not affected		
Duplicate	1,2,3,7,8,9-HxCDF	J,R	L1724928-12, -13, -14, -15, -16
Comments:	The replication for total TCDD is marginally above the control limit. Results for 2,3,7,8-TCDD and TEQ values are not affected		
Method Blank	OCDD	M,J	L1724928-12, -13, -14, -15, -16
Duplicate	1,2,3,7,8-PeCDD	M,J	L1724928-12, -13, -14, -15, -16
Comments:	The replication for total TCDD is marginally above the control limit. Results for 2,3,7,8-TCDD and TEQ values are not affected		
Duplicate	2,3,7,8-TCDD	M,J,R	L1724928-12, -13, -14, -15, -16
Comments:	The replication for total TCDD is marginally above the control limit. Results for 2,3,7,8-TCDD and TEQ values are not affected		
Method Blank	1,2,3,4,6,7,8-HpCDD	M,U	L1724928-12, -13, -14, -15, -16
Method Blank	1,2,3,6,7,8-HxCDF	M,U	L1724928-12, -13, -14, -15, -16
Method Blank	2,3,4,6,7,8-HxCDF	M,U	L1724928-12, -13, -14, -15, -16
Method Blank	2,3,7,8-TCDF	M,U	L1724928-12, -13, -14, -15, -16
Method Blank	OCDF	M,U	L1724928-12, -13, -14, -15, -16
Duplicate	1,2,3,4,7,8-HxCDD	[J]	L1724928-12, -13, -14, -15, -16
Comments:	The replication for total TCDD is marginally above the control limit. Results for 2,3,7,8-TCDD and TEQ values are not affected		
Duplicate	1,2,3,7,8,9-HxCDD	[J]	L1724928-12, -13, -14, -15, -16
Comments:	The replication for total TCDD is marginally above the control limit. Results for 2,3,7,8-TCDD and TEQ values are not affected		
Duplicate	1,2,3,7,8-PeCDF	[J]	L1724928-12, -13, -14, -15, -16
Comments:	The replication for total TCDD is marginally above the control limit. Results for 2,3,7,8-TCDD and TEQ values are not affected		
Method Blank	1,2,3,4,6,7,8-HpCDF	[U]	L1724928-12, -13, -14, -15, -16
Method Blank	1,2,3,4,7,8,9-HpCDF	[U]	L1724928-12, -13, -14, -15, -16
Method Blank	1,2,3,4,7,8-HxCDD	[U]	L1724928-12, -13, -14, -15, -16
Method Blank	1,2,3,4,7,8-HxCDF	[U]	L1724928-12, -13, -14, -15, -16
Method Blank	1,2,3,6,7,8-HxCDD	[U]	L1724928-12, -13, -14, -15, -16
Method Blank	1,2,3,7,8,9-HxCDD	[U]	L1724928-12, -13, -14, -15, -16
Method Blank	1,2,3,7,8,9-HxCDF	[U]	L1724928-12, -13, -14, -15, -16
Method Blank	1,2,3,7,8-PeCDD	[U]	L1724928-12, -13, -14, -15, -16
Method Blank	1,2,3,7,8-PeCDF	[U]	L1724928-12, -13, -14, -15, -16
Method Blank	2,3,4,7,8-PeCDF	[U]	L1724928-12, -13, -14, -15, -16
Method Blank	2,3,7,8-TCDD	[U]	L1724928-12, -13, -14, -15, -16
Method Blank	Total-HpCDD	[U]	L1724928-12, -13, -14, -15, -16
Method Blank	Total-HpCDF	[U]	L1724928-12, -13, -14, -15, -16
Method Blank	Total-HxCDD	[U]	L1724928-12, -13, -14, -15, -16
Method Blank	Total-HxCDF	[U]	L1724928-12, -13, -14, -15, -16
Method Blank	Total-PeCDD	[U]	L1724928-12, -13, -14, -15, -16
Method Blank	Total-PeCDF	[U]	L1724928-12, -13, -14, -15, -16
Method Blank	Total-TCDD	[U]	L1724928-12, -13, -14, -15, -16
Method Blank	Total-TCDF	[U]	L1724928-12, -13, -14, -15, -16

Qualifiers for Individual Parameters Listed:

Qualifier	Description
G	QC result did not meet ALS DQO. Refer to narrative comments for further information.
J,R	The analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,J	A peak has been manually integrated, and the analyte was detected below the calibrated range but above the EDL.
M,J,B	A peak has been manually integrated. Target analyte was detected below the calibrated range but above the EDL. Compound was detected in the method blank at >10% of the sample concentration.
M,J,R	A peak has been manually integrated, the analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,U	A peak has been manually integrated, and the analyte was not detected above the EDL.
SURR-ND	Surrogate recovery marginally exceeded ALS DQO. Reported non-detect results for associated samples were deemed to be unaffected.
	The analyte was detected below the calibrated range but above the EDL.

Reference Information

[J]

[U] The analyte was not detected above the EDL.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-TOT-ORG-LECO-SK	Soil	Organic Carbon by combustion method	SSSA (1996) p. 973

Total Organic Carbon (C-TOT-ORG-LECO-SK, C-TOT-ORG-SK)

Total C and inorganic C are determined on separate samples. The total C is determined by combustion and thermal conductivity detection, while inorganic C is determined by weight lass after addition of hydrochloric acid. Organic C is calculated by the difference between these two determinations.

Reference for Total C:
Nelson, D.W. and Sommers, L.E. 1996. Total Carbon, organic carbon and organic matter. P. 961-1010 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

Reference for Inorganic C:
Loeppert, R.H. and Suarez, D.L. 1996. Gravimetric Method for Loss of Carbon Dioxide. P. 455-456 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

CL-PASTE-COLOR-VA	Soil	Chloride in Soil (Paste) by Colourimetry	Carter-CSSS / APHA 4500-Cl E (modified)

A soil extract produced by the saturated paste extraction procedure is analyzed for chloride by ferricyanide colourimetry.

DX-1613B-HRMS-BU	Soil	Dioxins and Furans HR 1613B	USEPA 1613B

Samples are extracted by Soxhlet. The extracts are prepared using column chromatography, reduced in volume and analyzed by isotope-dilution GC/HRMS

HG-200.2-CVAF-VA	Soil	Mercury in Soil by CVAFS	EPA 200.2/1631E (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAFS.

MET-200.2-CCMS-VA	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample matrix, for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V.

MET-PASTE-ICP-VA	Soil	Metals in Soil (Paste) by ICPOES	Carter-CSSS / EPA 6010B (modified)

A soil extract produced by the saturated paste extraction procedure is analyzed for Sodium, Calcium, and Magnesium by ICPOES as per "Soil Sampling and Methods of Analysis" by M. Carter.

MOISTURE-BU	Soil	% Moisture	ASTM METHOD D2974-00
MOISTURE-VA	Soil	Moisture content	ASTM D2974-00 Method A

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

PAH-SUM-CALC-VA	Soil	Sum of PAH's	CALCULATION

Total PAH represents the sum of all PAH analytes reported for a given sample. Note that regulatory agencies and criteria differ in their definitions of Total PAH in terms of the individual PAH analytes to be included.

PAH-TMB-H/A-MS-VA	Soil	PAH - Rotary Extraction (Hexane/Acetone)	EPA 3570/8270

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3570 & 8270, published by the United States Environmental Protection Agency (EPA). The procedure uses a mechanical shaking technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene. The final extract is analysed by capillary column gas chromatography with mass spectrometric detection (GC/MS). Surrogate recoveries may not be reported in cases where interferences from the sample matrix prevent accurate quantitation. Because the two isomers cannot be readily chromatographically separated, benzo(j)fluoranthene is reported as part of the benzo(b)fluoranthene parameter.

PCB-CSR-SUM-CALC-VA	Soil	Total PCB (BC CSR) in soil	BC Contaminated Sites Regulation

Calculation of Total PCB to meet BC Contaminated Sites Regulation. Total PCB (BC CSR) is the sum of the concentrations of PCB aroclors 1242, 1248, 1254 and 1260. Results below detection limit (DL) are treated as zero. The Total PCB detection limit is equal to the highest of the aroclor detection limits used in the sum.

PCB-SE-ECD-VA	Soil	PCB by Extraction with GCECD	EPA8082, 3630

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3500, 3620, 3630, 3660, 3665 & 8082, published by the United States Environmental Protection Agency (EPA). The procedure involves a solid-liquid extraction of a subsample

Reference Information

of the sediment/soil using a mixture of hexane and acetone. Water is added to the extract and the resulting hexane extract undergoes one or more of the following clean-up procedures (if required): florisil clean-up, silica gel clean-up, sulphur clean-up and/or sulphuric acid clean-up. The final extract is analysed by capillary column gas chromatography with electron capture detection (GC/ECD).

PCB-SUM-CALC-VA	Soil	Total PCBs in soil	CALCULATION

Calculation of Total PCB. Total PCB is the sum of the concentrations of PCB aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, and 1268. Results below detection limit (DL) are treated as zero. The Total PCB detection limit is equal to the highest of the aroclor detection limits used in the sum.

PSA-PIPET-DETAIL-SK	Soil	Particle size - Sieve and Pipette	SSIR-51 METHOD 3.2.1

Particle size distribution is determined by a combination of techniques. Dry sieving is performed for coarse particles, wet sieving for sand particles and the pipette sedimentation method for clay particles.

Reference:

Burt, R. (2009). Soil Survey Field and Laboratory Methods Manual. Soil Survey Investigations Report No. 5. Method 3.2.1.2.2. United States Department of Agriculture Natural Resources Conservation Service.

SAT-PCNT-VA	Soil	Saturation Percentage	Carter-CSSS

Saturation Percentage (SP) is the total volume of water present in a saturated paste (in mL) divided by the dry weight of the sample (in grams), expressed as a percentage, as described in "Soil Sampling and Methods of Analysis" by M. Carter.

WHO1998-FISH-EDL-BU	Soil	WHO1998Toxic Equivalency-Fish ND=EDL	Calculation
WHO1998-FISH-HALF-BU	Soil	WHO1998Toxic Equivalency-Fish ND=1/2EDL	Calculation
WHO1998-FISH-ZERO-BU	Soil	WHO1998Toxic Equivalency-Fish ND=0	Calculation

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
BU	ALS ENVIRONMENTAL - BURLINGTON, ONTARIO, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # N/A

Report To		**Report Format / Distribution**	**Service Requested** (Rush for routine analysis subject to availability)
Company:	Stantec Consulting Ltd.	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Molly Brewis	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400A-2261 Keating Cross Road	Email 1: molly.brewis@stantec.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saanichton, BC V8M 2A5	Email 2: karen.munro@stantec.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-858-9969 Fax: 250-544-1105	Email 3: stefan.dick@stantec.com	**Analysis Request**
Invoice To	Same as Report ? ☑ Yes ☐ No	**Client / Project Information**	Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 123220054 task 225.101	
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:		Quote #:	
Lab Work (lab use)	L1724928-COFC	ALS Contact: Brent Mack	Sampler: MB & PW

Sample #	Sample Description (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-OD-200.2-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU		Archive			Number of Containers
1	PCL15 (0-0.5)	15-Jan-16	13:05	SEDIMENT	X	X	X	X	X	X	X						3
2	PCL07 (0-0.5)	15-Jan-16	15:10	SEDIMENT	X	X	X	X	X	X	X						3
3	PCL07 (0.5-1.0)	15-Jan-16	15:15	SEDIMENT	X	X	X	X	X	X	X						3
4	PCL07 (1.0-1.5)	15-Jan-16	15:30	SEDIMENT	X	X	X	X	X	X	X						3
5	PCL07 (1.5-2.0)	15-Jan-16	15:40	SEDIMENT				X	X					X			2
6	PCL07 (2.0-2.5)	15-Jan-16	15:50	SEDIMENT				X	X					X			2
7	PCL03 (0-0.5)	16-Jan-16	9:50	SEDIMENT	X	X	X	X	X	X	X						3
8	PCL01 (0-0.5)	16-Jan-16	11:35	SEDIMENT	X	X	X	X	X	X	X						3
9	PCL01 (0.5-1.0)	16-Jan-16	11:42	SEDIMENT	X	X	X	X	X	X	X						3
10	PCL01 (1.0-1.5)	16-Jan-16	11:50	SEDIMENT	X	X	X	X	X	X	X						3
11	PCL01 (1.5-2.0)	16-Jan-16	12:00	SEDIMENT				X	X					X			2

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Detailed breakdown of particle size for clay and silt fractions. Some samples for analysis AND archival (6 months).

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Molly Brewis MB	24-01-17	7:00	Tuila	Jan 18	11:30	6.5 °C				

VIA MR SPEEDY COURIER

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # N/A

Report To				**Report Format / Distribution**				**Service Requested** (Rush for routine analysis subject to availability)
Company:	Stantec Consulting Ltd.			☑ Standard	☐ Other			◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Molly Brewis			☑ PDF	☑ Excel	☐ Digital	☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400A-2261 Keating Cross Road			Email 1:	molly.brewis@stantec.com			○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saanichton, BC V8M 2A5			Email 2:	karen.munro@stantec.com			○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-858-9969	Fax:	250-544-1105	Email 3:	stefan.dick@stantec.com			**Analysis Request**
Invoice To	Same as Report ?	☑ Yes	☐ No	**Client / Project Information**				Please Indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?		☑ Yes	☐ No	Job #:	123220054 task 225.101			
Company:				PO / AFE:				
Contact:				LSD:				
Address:								
Phone:				Quote #:				

L1724928-COFC

[redacted] Lab (la

ALS Contact: Brent Mack **Sampler:** MB & PW

[redacted] Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-OD-200.2-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU		Archive			Number of Containers
[redacted]	PCS01 (0-0.2)	16-Jan-16	14:56	SEDIMENT				X	X	X		X					2
[redacted]	PCS01 (0.2-0.4)	16-Jan-16	15:05	SEDIMENT				X	X	X		X					2
[redacted]	PCS01 (0.4-0.6)	16-Jan-16	15:12	SEDIMENT				X	X	X		X					2
[redacted]	PCS01 (0.6-0.8)	16-Jan-16	15:18	SEDIMENT				X	X	X		X					2
[redacted]	PCS01 (0.8-1.0)	16-Jan-16	15:21	SEDIMENT				X	X	X		X					2
[redacted]	PCS01 (1.0-1.2)	16-Jan-16	15:25	SEDIMENT										X			2
[redacted]	PCS01 (1.2-1.4)	16-Jan-16	15:29	SEDIMENT										X			2
[redacted]																	
[redacted]																	
[redacted]																	
[redacted]																	
[redacted]																	
[redacted]																	
[redacted]																	
[redacted]																	

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Detailed breakdown of particle size for clay and silt fractions. Dioxins and Furans to be reported with WHO 1998 fish TEQs. Archived samples to be held for 6 months.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

[redacted] SHIPMENT RELEASE (client use)			[redacted] SHIPMENT RECEPTION (lab use only)				[redacted] SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Molly Brewis	17-Jan-16	7:00				°C				

STANTEC CONSULTING LTD.
ATTN: Molly Brewis
400 - 2261 Keating Cross Road
Saanichton BC V8M 2A5

Date Received: 04-FEB-16
Report Date: 04-APR-16 17:55 (MT)
Version: FINAL REV. 3

Client Phone: 250-655-6979

Certificate of Analysis

Lab Work Order #: L1731151

Project P.O. #: NOT SUBMITTED
Job Reference: 123220054 TASK 525.100
C of C Numbers:
Legal Site Desc:

Comments: 4-APR-2016 This report replaces the previous version and contains only those PAHs relevant for Ocean Disposal, and recalculates Total PAHs.

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731151-1	L1731151-2	L1731151-3	L1731151-4	L1731151-5
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	03-FEB-16	03-FEB-16	03-FEB-16	03-FEB-16	03-FEB-16
	Sampled Time	11:18	11:20	11:26	11:28	10:46
	Client ID	PCL21 (0-0.5)	PCL21 (0.5-1.0)	PCL21 (1.0-1.5)	PCL21 (1.5-1.65)	SS10 (0-0.075)
Grouping	**Analyte**					
SOIL						
Physical Tests	% Moisture (%)				16.4	
	Moisture (%)	24.7	21.5	20.6		44.1
Particle Size	% Gravel (>2mm) (%)	0.39	0.61	1.33	3.37	1.32
	% Sand (2.00mm - 1.00mm) (%)	1.51	1.69	3.40	5.75	2.56
	% Sand (1.00mm - 0.50mm) (%)	3.37	5.17	9.50	14.5	0.95
	% Sand (0.50mm - 0.25mm) (%)	7.72	11.4	16.6	17.2	0.94
	% Sand (0.25mm - 0.125mm) (%)	25.3	32.3	31.4	24.0	6.62
	% Sand (0.125mm - 0.063mm) (%)	27.0	25.5	21.4	20.3	15.6
	% Silt (0.063mm - 0.0312mm) (%)	11.3	9.23	6.99	6.72	16.0
	% Silt (0.0312mm - 0.004mm) (%)	13.2	8.01	5.10	4.48	33.3
	% Clay (<4um) (%)	10.3	6.10	4.32	3.78	22.8
	Texture	Sandy loam	Loamy sand	Sand	Sand	Silt loam
Organic / Inorganic Carbon	Total Organic Carbon (%)	0.81	0.68	0.47		2.12
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	2910	2910	3000		8540
	% Saturation (%)	33.9	28.1	27.1		66.8
	Sodium (Na) (mg/kg)	1680	1430	1530		4330
Metals	Arsenic (As) (mg/kg)	5.61	5.02	4.47		7.93
	Cadmium (Cd) (mg/kg)	0.129	0.153	0.204		0.165
	Chromium (Cr) (mg/kg)	17.8	15.0	14.0		24.6
	Copper (Cu) (mg/kg)	14.7	9.29	7.19		33.4
	Lead (Pb) (mg/kg)	4.19	2.57	2.06		10.2
	Mercury (Hg) (mg/kg)	0.0241	0.0131	0.0120		0.0602
	Nickel (Ni) (mg/kg)	11.7	8.84	7.87		19.8
	Zinc (Zn) (mg/kg)	46.1	35.3	30.2		79.9
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.0050	<0.0050	<0.0050		0.0081
	Acenaphthylene (mg/kg)	<0.0050	<0.0050	<0.0050		0.0121
	Anthracene (mg/kg)	<0.0040	<0.0040	<0.0040		0.0279
	Benz(a)anthracene (mg/kg)	<0.010	<0.010	<0.010		0.075
	Benzo(a)pyrene (mg/kg)	<0.010	<0.010	<0.010		0.054
	Benzo(b&j)fluoranthene (mg/kg)	0.012	<0.010	<0.010		0.086
	Benzo(g,h,i)perylene (mg/kg)	<0.010	<0.010	<0.010		0.035
	Benzo(k)fluoranthene (mg/kg)	<0.010	<0.010	<0.010		0.031
	Chrysene (mg/kg)	0.012	<0.010	<0.010		0.093
	Dibenz(a,h)anthracene (mg/kg)	<0.0050	<0.0050	<0.0050		0.0094
	Fluoranthene (mg/kg)	0.014	<0.010	<0.010		0.156

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731151-6	L1731151-7	L1731151-8		
	Description	Sediment	Sediment	Sediment		
	Sampled Date	03-FEB-16	03-FEB-16	03-FEB-16		
	Sampled Time	10:04	10:13			
	Client ID	SS15 (0-0.075)	SS13 (0-0.075)	SPLIT 9 (0-0.075)		
Grouping	**Analyte**					
SOIL						
Physical Tests	% Moisture (%)					
	Moisture (%)	40.2	44.9	40.3		
Particle Size	% Gravel (>2mm) (%)	0.90	0.85	0.46		
	% Sand (2.00mm - 1.00mm) (%)	2.92	0.66	1.58		
	% Sand (1.00mm - 0.50mm) (%)	4.05	0.37	0.47		
	% Sand (0.50mm - 0.25mm) (%)	6.45	0.99	1.14		
	% Sand (0.25mm - 0.125mm) (%)	14.3	8.03	8.30		
	% Sand (0.125mm - 0.063mm) (%)	15.1	16.4	16.0		
	% Silt (0.063mm - 0.0312mm) (%)	12.5	17.7	16.1		
	% Silt (0.0312mm - 0.004mm) (%)	25.2	33.2	33.5		
	% Clay (<4um) (%)	18.7	21.8	22.5		
	Texture	Loam	Silt loam	Silt loam		
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.41	2.66	2.12		
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	6300	8870			
	% Saturation (%)	57.5	68.7			
	Sodium (Na) (mg/kg)	3180	4840			
Metals	Arsenic (As) (mg/kg)	8.40	9.14	10.4		
	Cadmium (Cd) (mg/kg)	0.146	0.181	0.183		
	Chromium (Cr) (mg/kg)	25.1	25.1	27.2		
	Copper (Cu) (mg/kg)	28.6	35.2	38.8		
	Lead (Pb) (mg/kg)	8.23	10.4	10.5		
	Mercury (Hg) (mg/kg)	0.0465	0.0620	0.0785		
	Nickel (Ni) (mg/kg)	19.0	19.9	22.3		
	Zinc (Zn) (mg/kg)	74.8	80.3	86.2		
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.0050	0.0063	<0.0050		
	Acenaphthylene (mg/kg)	<0.0050	0.0064	<0.0050		
	Anthracene (mg/kg)	0.0075	0.0255	0.0125		
	Benz(a)anthracene (mg/kg)	0.016	0.055	0.028		
	Benzo(a)pyrene (mg/kg)	0.013	0.051	0.024		
	Benzo(b&j)fluoranthene (mg/kg)	0.026	0.089	0.047		
	Benzo(g,h,i)perylene (mg/kg)	0.011	0.040	0.020		
	Benzo(k)fluoranthene (mg/kg)	<0.010	0.032	0.017		
	Chrysene (mg/kg)	0.025	0.080	0.040		
	Dibenz(a,h)anthracene (mg/kg)	<0.0050	0.0086	<0.0050		
	Fluoranthene (mg/kg)	0.033	0.143	0.060		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1731151-1 Sediment 03-FEB-16 11:18 PCL21 (0-0.5)	L1731151-2 Sediment 03-FEB-16 11:20 PCL21 (0.5-1.0)	L1731151-3 Sediment 03-FEB-16 11:26 PCL21 (1.0-1.5)	L1731151-4 Sediment 03-FEB-16 11:28 PCL21 (1.5-1.65)	L1731151-5 Sediment 03-FEB-16 10:46 SS10 (0-0.075)
SOIL						
Polycyclic Aromatic Hydrocarbons	Fluorene (mg/kg)	<0.010	<0.010	<0.010		0.016
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.010	<0.010	<0.010		0.027
	Naphthalene (mg/kg)	<0.010	<0.010	<0.010		0.012
	Phenanthrene (mg/kg)	0.011	<0.010	<0.010		0.082
	Pyrene (mg/kg)	0.015	<0.010	<0.010		0.139
	Surrogate: d10-Acenaphthene (%)	88.3	90.9	91.5		85.8
	Surrogate: d12-Chrysene (%)	96.8	100.5	98.6		100.0
	Surrogate: d10-Phenanthrene (%)	92.3	92.5	91.6		97.4
	Total PAHs (mg/kg)	0.052	<0.035	<0.035		0.776
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020	<0.020	<0.020		<0.020
	PCB-1221 (mg/kg)	<0.020	<0.020	<0.020		<0.020
	PCB-1232 (mg/kg)	<0.020	<0.020	<0.020		<0.020
	PCB-1242 (mg/kg)	<0.020	<0.020	<0.020		<0.020
	PCB-1248 (mg/kg)	<0.020	<0.020	<0.020		<0.020
	PCB-1254 (mg/kg)	<0.020	<0.020	<0.020		<0.020
	PCB-1260 (mg/kg)	<0.020	<0.020	<0.020		<0.020
	PCB-1262 (mg/kg)	<0.020	<0.020	<0.020		<0.020
	PCB-1268 (mg/kg)	<0.020	<0.020	<0.020		<0.020
	Total PCB (BC CSR) (mg/kg)	<0.020	<0.020	<0.020		<0.020
	Total Polychlorinated Biphenyls (mg/kg)	<0.020	<0.020	<0.020		<0.020
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)					1.77183
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)					1.56543
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)					1.35903
	TEF Reference					World Health Organization 1998
	TEF Species					Fish
	2,3,7,8-TCDD (pg/g)					0.41 M,J
	1,2,3,7,8-PeCDD (pg/g)					<0.15 [U]
	1,2,3,4,7,8-HxCDD (pg/g)					<0.38 [U]
	1,2,3,6,7,8-HxCDD (pg/g)					4.67
	1,2,3,7,8,9-HxCDD (pg/g)					1.66 [J]
	1,2,3,4,6,7,8-HpCDD (pg/g)					25.0
	OCDD (pg/g)					156
	Total-TCDD (pg/g)					1.26

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731151-6	L1731151-7	L1731151-8		
	Description	Sediment	Sediment	Sediment		
	Sampled Date	03-FEB-16	03-FEB-16	03-FEB-16		
	Sampled Time	10:04	10:13			
	Client ID	SS15 (0-0.075)	SS13 (0-0.075)	SPLIT 9 (0-0.075)		
Grouping	**Analyte**					
SOIL						
Polycyclic Aromatic Hydrocarbons	Fluorene (mg/kg)	<0.010	0.014	<0.010		
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.010	0.028	0.014		
	Naphthalene (mg/kg)	<0.010	0.014	<0.010		
	Phenanthrene (mg/kg)	0.022	0.075	0.029		
	Pyrene (mg/kg)	0.030	0.119	0.051		
	Surrogate: d10-Acenaphthene (%)	76.6	85.5	88.1		
	Surrogate: d12-Chrysene (%)	94.0	96.6	96.0		
	Surrogate: d10-Phenanthrene (%)	89.7	96.8	92.7		
	Total PAHs (mg/kg)	0.158	0.698	0.294		
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1221 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1232 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1242 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1248 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1254 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1260 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1262 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1268 (mg/kg)	<0.020	<0.020	<0.020		
	Total PCB (BC CSR) (mg/kg)	<0.020	<0.020	<0.020		
	Total Polychlorinated Biphenyls (mg/kg)	<0.020	<0.020	<0.020		
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)	1.52838	2.71553	2.69891		
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)	1.41723	2.36898	2.62031		
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)	0.55958	1.83393	2.32271		
	TEF Reference	World Health Organization 1998	World Health Organization 1998	World Health Organization 1998		
	TEF Species	Fish	Fish	Fish		
	2,3,7,8-TCDD (pg/g)	0.29 M,J,R	<0.33 M,U	0.48 M,J		
	1,2,3,7,8-PeCDD (pg/g)	0.27 M,J,R	0.71 M,J	0.88 M,J		
	1,2,3,4,7,8-HxCDD (pg/g)	<0.33 [U]	<0.39 [U]	<0.26 [U]		
	1,2,3,6,7,8-HxCDD (pg/g)	3.96 M,J	6.10 [M]	6.21		
	1,2,3,7,8,9-HxCDD (pg/g)	1.30 M,J	2.76 M,J	2.43 [J]		
	1,2,3,4,6,7,8-HpCDD (pg/g)	17.1	30.0	25.2		
	OCDD (pg/g)	101	175	149		
	Total-TCDD (pg/g)	0.52	0.70	1.47		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1731151-1	L1731151-2	L1731151-3	L1731151-4	L1731151-5
Description	Sediment	Sediment	Sediment	Sediment	Sediment
Sampled Date	03-FEB-16	03-FEB-16	03-FEB-16	03-FEB-16	03-FEB-16
Sampled Time	11:18	11:20	11:26	11:28	10:46
Client ID	PCL21 (0-0.5)	PCL21 (0.5-1.0)	PCL21 (1.0-1.5)	PCL21 (1.5-1.65)	SS10 (0-0.075)
Grouping / **Analyte**					
SOIL					
Dioxins and Furans					
Total TCDD # Homologues					3
Total-PeCDD (pg/g)					0.80
Total PeCDD # Homologues					2
Total-HxCDD (pg/g)					30.9
Total HxCDD # Homologues					5
Total-HpCDD (pg/g)					74.5
Total HpCDD # Homologues					2
2,3,7,8-TCDF (pg/g)					11.0
1,2,3,7,8-PeCDF (pg/g)					<0.11 [U]
2,3,4,7,8-PeCDF (pg/g)					0.463 [J]
1,2,3,4,7,8-HxCDF (pg/g)					<0.20 [U]
1,2,3,6,7,8-HxCDF (pg/g)					<0.18 M,U
1,2,3,7,8,9-HxCDF (pg/g)					<0.27 [U]
2,3,4,6,7,8-HxCDF (pg/g)					0.26 M,J
1,2,3,4,6,7,8-HpCDF (pg/g)					3.77 [J]
1,2,3,4,7,8,9-HpCDF (pg/g)					<0.23 [U]
OCDF (pg/g)					11.3
Total-TCDF (pg/g)					18.6
Total TCDF # Homologues					6
Total-PeCDF (pg/g)					0.66
Total PeCDF # Homologues					2
Total-HxCDF (pg/g)					5.82
Total HxCDF # Homologues					3
Total-HpCDF (pg/g)					11.5
Total HpCDF # Homologues					2
Surrogate: 13C12-2,3,7,8-TCDD (%)					62.0
Surrogate: 13C12-1,2,3,7,8-PeCDD (%)					50.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)					73.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)					82.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)					72.0
Surrogate: 13C12-OCDD (%)					68.0
Surrogate: 13C12-2,3,7,8-TCDF (%)					65.0
Surrogate: 13C12-1,2,3,7,8-PeCDF (%)					53.0
Surrogate: 13C12-2,3,4,7,8-PeCDF (%)					53.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)					75.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)					87.0
Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)					78.0

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731151-6	L1731151-7	L1731151-8		
	Description	Sediment	Sediment	Sediment		
	Sampled Date	03-FEB-16	03-FEB-16	03-FEB-16		
	Sampled Time	10:04	10:13			
	Client ID	SS15 (0-0.075)	SS13 (0-0.075)	SPLIT 9 (0-0.075)		
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total TCDD # Homologues	1	2	3		
	Total-PeCDD (pg/g)	2.09	3.19	3.72		
	Total PeCDD # Homologues	3	3	4		
	Total-HxCDD (pg/g)	32.2	55.1	41.2		
	Total HxCDD # Homologues	4	4	3		
	Total-HpCDD (pg/g)	40.8	75.5	68.4		
	Total HpCDD # Homologues	2	2	2		
	2,3,7,8-TCDF (pg/g)	8.93	18.3	14.8		
	1,2,3,7,8-PeCDF (pg/g)	0.130 J,R	0.37 J,R	0.26 [J]		
	2,3,4,7,8-PeCDF (pg/g)	0.360 M,J,R	0.34 J,R	0.410 J,R		
	1,2,3,4,7,8-HxCDF (pg/g)	<0.13 [U]	<0.39 M,U	0.14 J,R		
	1,2,3,6,7,8-HxCDF (pg/g)	<0.12 M,U	<0.36 [U]	<0.11 M,U		
	1,2,3,7,8,9-HxCDF (pg/g)	<0.18 [U]	<0.53 [U]	<0.14 [U]		
	2,3,4,6,7,8-HxCDF (pg/g)	<0.12 M,U	<0.34 [U]	0.30 M,J		
	1,2,3,4,6,7,8-HpCDF (pg/g)	3.22 [J]	6.83	4.88		
	1,2,3,4,7,8,9-HpCDF (pg/g)	<0.23 [U]	<0.61 [U]	<0.22 [U]		
	OCDF (pg/g)	10.8	15.3	14.1		
	Total-TCDF (pg/g)	17.5	30.2	29.8		
	Total TCDF # Homologues	6	4	8		
	Total-PeCDF (pg/g)	1.87	3.98	4.00		
	Total PeCDF # Homologues	2	4	5		
	Total-HxCDF (pg/g)	2.12	7.73	5.06		
	Total HxCDF # Homologues	1	2	4		
	Total-HpCDF (pg/g)	9.12	19.7	15.0		
	Total HpCDF # Homologues	2	2	2		
	Surrogate: 13C12-2,3,7,8-TCDD (%)	69.0	71.0	71.0		
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)	62.0	69.0	59.0		
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)	74.0	76.0	79.0		
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)	88.0	99.0	97.0		
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)	70.0	78.0	83.0		
	Surrogate: 13C12-OCDD (%)	58.0	73.0	63.0		
	Surrogate: 13C12-2,3,7,8-TCDF (%)	75.0	73.0	77.0		
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)	66.0	71.0	63.0		
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)	66.0	73.0	62.0		
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)	77.0	82.0	84.0		
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)	94.0	100.0	98.0		
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)	86.0	98.0	95.0		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731151-1	L1731151-2	L1731151-3	L1731151-4	L1731151-5
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	03-FEB-16	03-FEB-16	03-FEB-16	03-FEB-16	03-FEB-16
	Sampled Time	11:18	11:20	11:26	11:28	10:46
	Client ID	PCL21 (0-0.5)	PCL21 (0.5-1.0)	PCL21 (1.0-1.5)	PCL21 (1.5-1.65)	SS10 (0-0.075)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)					72.0
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)					79.0
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)					75.0
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)					58.0
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)					2.64
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)					2.77
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)					2.90

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731151-6	L1731151-7	L1731151-8		
	Description	Sediment	Sediment	Sediment		
	Sampled Date	03-FEB-16	03-FEB-16	03-FEB-16		
	Sampled Time	10:04	10:13			
	Client ID	SS15 (0-0.075)	SS13 (0-0.075)	SPLIT 9 (0-0.075)		
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)	79.0	83.0	91.0		
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)	80.0	86.0	95.0		
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)	73.0	86.0	87.0		
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)	59.0	60.0	61.0		
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)	1.66	3.85	4.09		
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)	2.37	4.24	4.26		
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)	2.42	4.50	4.28		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Total-HxCDF	G	L1731151-5, -6, -7, -8
Comments:	Sample and duplicate RPD criteia outside method limits for selected low level homologue groups		
Duplicate	Total-PeCDF	G	L1731151-5, -6, -7, -8
Comments:	Sample and duplicate RPD criteia outside method limits for selected low level homologue groups		
Duplicate	Total-TCDD	G	L1731151-5, -6, -7, -8
Comments:	Sample and duplicate RPD criteia outside method limits for selected low level homologue groups		
Duplicate	1,2,3,4,6,7,8-HpCDF	J,R	L1731151-5, -6, -7, -8
Comments:	Sample and duplicate RPD criteia outside method limits for selected low level homologue groups		
Duplicate	1,2,3,6,7,8-HxCDD	J,R	L1731151-5, -6, -7, -8
Comments:	Sample and duplicate RPD criteia outside method limits for selected low level homologue groups		
Duplicate	1,2,3,7,8-PeCDF	J,R	L1731151-5, -6, -7, -8
Comments:	Sample and duplicate RPD criteia outside method limits for selected low level homologue groups		
Duplicate	2,3,4,6,7,8-HxCDF	J,R	L1731151-5, -6, -7, -8
Comments:	Sample and duplicate RPD criteia outside method limits for selected low level homologue groups		
Duplicate	2,3,4,7,8-PeCDF	J,R	L1731151-5, -6, -7, -8
Comments:	Sample and duplicate RPD criteia outside method limits for selected low level homologue groups		
Duplicate	2,3,7,8-TCDD	J,R	L1731151-5, -6, -7, -8
Comments:	Sample and duplicate RPD criteia outside method limits for selected low level homologue groups		
Duplicate	1,2,3,7,8,9-HxCDD	M,J,R	L1731151-5, -6, -7, -8
Comments:	Sample and duplicate RPD criteia outside method limits for selected low level homologue groups		
Method Blank	1,2,3,7,8,9-HxCDF	M,U	L1731151-5, -6, -7, -8
Method Blank	OCDD	M,U	L1731151-5, -6, -7, -8
Duplicate	1,2,3,4,7,8-HxCDF	M,U	L1731151-5, -6, -7, -8
Comments:	Sample and duplicate RPD criteia outside method limits for selected low level homologue groups		
Duplicate	1,2,3,6,7,8-HxCDF	M,U	L1731151-5, -6, -7, -8
Comments:	Sample and duplicate RPD criteia outside method limits for selected low level homologue groups		
Method Blank	1,2,3,4,6,7,8-HpCDD	[U]	L1731151-5, -6, -7, -8
Method Blank	1,2,3,4,6,7,8-HpCDF	[U]	L1731151-5, -6, -7, -8
Method Blank	1,2,3,4,7,8,9-HpCDF	[U]	L1731151-5, -6, -7, -8
Method Blank	1,2,3,4,7,8-HxCDD	[U]	L1731151-5, -6, -7, -8
Method Blank	1,2,3,4,7,8-HxCDF	[U]	L1731151-5, -6, -7, -8
Method Blank	1,2,3,6,7,8-HxCDD	[U]	L1731151-5, -6, -7, -8
Method Blank	1,2,3,6,7,8-HxCDF	[U]	L1731151-5, -6, -7, -8
Method Blank	1,2,3,7,8,9-HxCDD	[U]	L1731151-5, -6, -7, -8
Method Blank	1,2,3,7,8-PeCDD	[U]	L1731151-5, -6, -7, -8
Method Blank	1,2,3,7,8-PeCDF	[U]	L1731151-5, -6, -7, -8
Method Blank	2,3,4,6,7,8-HxCDF	[U]	L1731151-5, -6, -7, -8
Method Blank	2,3,4,7,8-PeCDF	[U]	L1731151-5, -6, -7, -8
Method Blank	2,3,7,8-TCDD	[U]	L1731151-5, -6, -7, -8
Method Blank	2,3,7,8-TCDF	[U]	L1731151-5, -6, -7, -8
Method Blank	OCDF	[U]	L1731151-5, -6, -7, -8
Method Blank	Total-HpCDD	[U]	L1731151-5, -6, -7, -8
Method Blank	Total-HpCDF	[U]	L1731151-5, -6, -7, -8
Method Blank	Total-HxCDD	[U]	L1731151-5, -6, -7, -8
Method Blank	Total-HxCDF	[U]	L1731151-5, -6, -7, -8
Method Blank	Total-PeCDD	[U]	L1731151-5, -6, -7, -8
Method Blank	Total-PeCDF	[U]	L1731151-5, -6, -7, -8
Method Blank	Total-TCDD	[U]	L1731151-5, -6, -7, -8
Method Blank	Total-TCDF	[U]	L1731151-5, -6, -7, -8
Duplicate	1,2,3,4,7,8,9-HpCDF	[U]	L1731151-5, -6, -7, -8
Comments:	Sample and duplicate RPD criteia outside method limits for selected low level homologue groups		
Duplicate	1,2,3,4,7,8-HxCDD	[U]	L1731151-5, -6, -7, -8

Reference Information

	Parameter	Qualifier	Applies to Sample Number(s)
	Sample and duplicate RPD criteia outside method limits for selected low level homologue groups		
Comments:			
Duplicate	1,2,3,7,8,9-HxCDF	[U]	L1731151-5, -6, -7, -8
Comments:	Sample and duplicate RPD criteia outside method limits for selected low level homologue groups		
Duplicate	1,2,3,7,8-PeCDD	[U]	L1731151-5, -6, -7, -8
Comments:	Sample and duplicate RPD criteia outside method limits for selected low level homologue groups		
Duplicate	Total-HxCDF	[U]	L1731151-5, -6, -7, -8
Comments:	Sample and duplicate RPD criteia outside method limits for selected low level homologue groups		
Duplicate	Total-PeCDF	[U]	L1731151-5, -6, -7, -8
Comments:	Sample and duplicate RPD criteia outside method limits for selected low level homologue groups		
Duplicate	Total-TCDD	[U]	L1731151-5, -6, -7, -8
Comments:	Sample and duplicate RPD criteia outside method limits for selected low level homologue groups		

Qualifiers for Individual Parameters Listed:

Qualifier	Description
G	QC result did not meet ALS DQO. Refer to narrative comments for further information.
J,R	The analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,J	A peak has been manually integrated, and the analyte was detected below the calibrated range but above the EDL.
M,J,R	A peak has been manually integrated, the analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,U	A peak has been manually integrated, and the analyte was not detected above the EDL.
[J]	The analyte was detected below the calibrated range but above the EDL.
[U]	The analyte was not detected above the EDL.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-TOT-ORG-LECO-SK	Soil	Organic Carbon by combustion method	SSSA (1996) p. 973

Total Organic Carbon (C-TOT-ORG-LECO-SK, C-TOT-ORG-SK)

Total C and inorganic C are determined on separate samples. The total C is determined by combustion and thermal conductivity detection, while inorganic C is determined by weight lass after addition of hydrochloric acid. Organic C is calculated by the difference between these two determinations.

Reference for Total C:
Nelson, D.W. and Sommers, L.E. 1996. Total Carbon, organic carbon and organic matter. P. 961-1010 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

Reference for Inorganic C:
Loeppert, R.H. and Suarez, D.L. 1996. Gravimetric Method for Loss of Carbon Dioxide. P. 455-456 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

CL-PASTE-COLOR-VA	Soil	Chloride in Soil (Paste) by Colourimetry	Carter-CSSS / APHA 4500-Cl E (modified)

A soil extract produced by the saturated paste extraction procedure is analyzed for chloride by ferricyanide colourimetry.

DX-1613B-HRMS-BU	Soil	Dioxins and Furans HR 1613B	USEPA 1613B

Samples are extracted by Soxhlet. The extracts are prepared using column chromatography, reduced in volume and analyzed by isotope-dilution GC/HRMS

HG-200.2-CVAF-VA	Soil	Mercury in Soil by CVAFS	EPA 200.2/1631E (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAFS.

HG-WW-200.2-CVAF-VA	Soil	Hg in Soil by CVAFS	EPA 200.2/245.7

This analysis is carried out using procedures from CSR Analytical Method: "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, 26 June 2009, and procedures adapted from EPA Method 200.2. The sample is manually homogenized, sieved (wet sample) through a 2 mm (10 mesh) sieve, and a representative subsample of the material is weighed. The sample is then digested at 95 degrees Celsius for 2 hours by block digester using concentrated nitric and hydrochloric acids. Instrumental analysis is by atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

Reference Information

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

MET-200.2-CCMS-VA Soil Metals in Soil by CRC ICPMS EPA 200.2/6020A (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample matrix, for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V.

MET-PASTE-ICP-VA Soil Metals in Soil (Paste) by ICPOES Carter-CSSS / EPA 6010B (modified)

A soil extract produced by the saturated paste extraction procedure is analyzed for Sodium, Calcium, and Magnesium by ICPOES as per "Soil Sampling and Methods of Analysis" by M. Carter.

MET-WW-200.2-CCMS-VA Soil Metals in Soil by CRC ICPMS EPA 200.2/6020A (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample matrix, for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V.

MOIST-SK Soil Moisture Content ASTM D2216-80

The weighed portion of soil is placed in a 105°C oven overnight. The dried soil is allowed to cooled to room temperature, weighed and the % moisture is calculated.

Reference: ASTM D2216-80

MOISTURE-BU Soil % Moisture ASTM METHOD D2974-00

MOISTURE-SIEVE-VA Soil Moisture for CSR Metals Calculations ASTM D2974-00 Method A

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

MOISTURE-VA Soil Moisture content ASTM D2974-00 Method A

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

PAH-BCCSR-CL Soil PAHs - BC CSR Regs EPA 3570/8270-GC/MS

PAH-SUM-CALC-VA Soil Sum of PAH's CALCULATION

Total PAH represents the sum of all PAH analytes reported for a given sample. Note that regulatory agencies and criteria differ in their definitions of Total PAH in terms of the individual PAH analytes to be included.

PCB-CSR-SUM-CALC-VA Soil Total PCB (BC CSR) in soil BC Contaminated Sites Regulation

Calculation of Total PCB to meet BC Contaminated Sites Regulation. Total PCB (BC CSR) is the sum of the concentrations of PCB aroclors 1242, 1248, 1254 and 1260. Results below detection limit (DL) are treated as zero. The Total PCB detection limit is equal to the highest of the aroclor detection limits used in the sum.

PCB-SE-ECD-VA Soil PCB by Extraction with GCECD EPA8082, 3630

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3500, 3620, 3630, 3660, 3665 & 8082, published by the United States Environmental Protection Agency (EPA). The procedure involves a solid-liquid extraction of a subsample of the sediment/soil using a mixture of hexane and acetone. Water is added to the extract and the resulting hexane extract undergoes one or more of the following clean-up procedures (if required): florisil clean-up, silica gel clean-up, sulphur clean-up and/or sulphuric acid clean-up. The final extract is analysed by capillary column gas chromatography with electron capture detection (GC/ECD).

PCB-SUM-CALC-VA Soil Total PCBs in soil CALCULATION

Calculation of Total PCB. Total PCB is the sum of the concentrations of PCB aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, and 1268. Results below detection limit (DL) are treated as zero. The Total PCB detection limit is equal to the highest of the aroclor detection limits used in the sum.

PSA-PIPET-DETAIL-SK Soil Particle size - Sieve and Pipette SSIR-51 METHOD 3.2.1

Particle size distribution is determined by a combination of techniques. Dry sieving is performed for coarse particles, wet sieving for sand particles and the pipette sedimentation method for clay particles.

Reference:

Burt, R. (2009). Soil Survey Field and Laboratory Methods Manual. Soil Survey Investigations Report No. 5. Method 3.2.1.2.2. United States Department of Agriculture Natural Resources Conservation Service.

Reference Information

SAT-PCNT-VA	Soil	Saturation Percentage	Carter-CSSS

Saturation Percentage (SP) is the total volume of water present in a saturated paste (in mL) divided by the dry weight of the sample (in grams), expressed as a percentage, as described in "Soil Sampling and Methods of Analysis" by M. Carter.

WHO1998-FISH-EDL-BU	Soil	WHO1998Toxic Equivalency-Fish ND=EDL	Calculation
WHO1998-FISH-HALF-BU	Soil	WHO1998Toxic Equivalency-Fish ND=1/2EDL	Calculation
WHO1998-FISH-ZERO-BU	Soil	WHO1998Toxic Equivalency-Fish ND=0	Calculation

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA
BU	ALS ENVIRONMENTAL - BURLINGTON, ONTARIO, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # N/A

Page 1 of

ALS Environmental

Report To			
Company:	Stantec Consulting Ltd.		
Contact:	Molly Brewis		
Address:	400A-2261 Keating Cross Road		
	Saanichton, BC V8M 2A5		
Phone:	250-858-9969	Fax: 250-544-1105	
Invoice To	Same as Report ?	☑ Yes	☐ No
Hardcopy of Invoice with Report?		☑ Yes	☐ No
Company:			
Contact:			
Address:			
Phone:			

Report Format / Distribution

☑ Standard ☐ Other

☑ PDF ☑ Excel ☐ Digital ☐ Fax

Email 1: molly.brewis@stantec.com

Email 2: karen.munro@stantec.com

Email 3: stefan.dick@stantec.com

Client / Project Information

Job #: 123220054 task 225.101

PO / AFE:

LSD:

Quote #:

ALS Contact: Brent Mack **Sampler:** SW & BT

Service Requested (Rush for routine analysis subject to availability)

◉ Regular (Standard Turnaround Times - Business Days)

○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT

○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT

○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT

Analysis Request

Please indicate below Filtered, Preserved or both (F, P, F/P)

Lab Work (lab use)

L1731151-COFC

Sample #	(This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-OD-200.2-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU			Archive		Number of Containers
	PCL21 (0-0.5)	03-Feb-16	11:18	SEDIMENT	X	X	X	X	X	X	X						3
	PCL21 (0.5-1.0)	03-Feb-16	11:20	SEDIMENT	X	X	X	X	X	X	X						3
	PCL21 (1.0-1.5)	03-Feb-16	11:26	SEDIMENT	X	X	X	X	X	X	X						3
	PCL21 (1.5-1.65)	03-Feb-16	11:28	SEDIMENT				X	X						X		1
	SS10 (0-0.075)	03-Feb-16	10:46	SEDIMENT	X	X	X	X	X	X	X	X					2
	SS15 (0-0.075)	03-Feb-16	10:04	SEDIMENT	X	X	X	X	X	X	X	X					4
	SS13 (0-0.075)	03-Feb-16	10:13	SEDIMENT	X	X	X	X	X	X	X	X					4
	SPLIT 9 (0-0.075)	03-Feb-16		SEDIMENT	X	X	X	X	X	X		X					4
																	3

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Detailed breakdown of particle size for clay and silt fractions. Dioxins and Furans to be reported with WHO 1998 fish TEQs. Some samples for analysis AND archival. Archived samples to be held for 6 months.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No? If Yes add SIF
Barrie Tuite	4-Feb-16	13:00	lady	Feb 4	1:30PM	8/8°C				

GENF 18.01 Front

STANTEC CONSULTING LTD.
ATTN: Molly Brewis
400 - 2261 Keating Cross Road
Saanichton BC V8M 2A5

Date Received: 02-FEB-16
Report Date: 04-APR-16 17:55 (MT)
Version: FINAL REV. 6

Client Phone: 250-655-6979

Certificate of Analysis

Lab Work Order #: L1730019

Project P.O. #: NOT SUBMITTED
Job Reference: 123220054 TASK 525.100
C of C Numbers:
Legal Site Desc:

Comments: 4-APR-2016 This report replaces the previous version and contains only PAH analytes relevant to Ocean Disposal, and a recalculation of Total PAHs.

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-1	L1730019-2	L1730019-3	L1730019-4	L1730019-5
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16
	Sampled Time	11:23	11:37	11:48	11:57	12:04
	Client ID	PCL30 (0-0.5)	PCL30 (0.5-1.0)	PCL30 (1.0-1.5)	PCL30 (1.5-2.0)	PCL30 (2.0-2.16)
Grouping	**Analyte**					
SOIL						
Physical Tests	% Moisture (%)				21.2	18.8
	Moisture (%)	32.5	29.0	27.3		
Particle Size	% Gravel (>2mm) (%)	0.34	0.60	1.50	1.53	1.94
	% Sand (2.00mm - 1.00mm) (%)	3.03	3.21	4.22	4.95	4.92
	% Sand (1.00mm - 0.50mm) (%)	3.34	3.03	5.07	5.45	5.23
	% Sand (0.50mm - 0.25mm) (%)	5.05	4.72	9.60	9.04	7.97
	% Sand (0.25mm - 0.125mm) (%)	18.5	19.5	28.9	37.2	33.0
	% Sand (0.125mm - 0.063mm) (%)	15.3	17.0	15.1	20.1	27.4
	% Silt (0.063mm - 0.0312mm) (%)	11.9	12.1	8.32	6.84	8.30
	% Silt (0.0312mm - 0.004mm) (%)	25.0	23.4	14.9	7.19	5.96
	% Clay (<4um) (%)	17.5	16.4	12.4	7.73	5.37
	Texture	Loam	Loam	Sandy loam	Loamy sand	Loamy sand
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.21	1.06	0.80		
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	5990	4690	5040		
	% Saturation (%)	49.3	41.1	44.4		
	Sodium (Na) (mg/kg)	2940	2260	2440		
Metals	Arsenic (As) (mg/kg)	9.60	9.07	8.16	6.40	4.84
	Cadmium (Cd) (mg/kg)	0.182	0.218	0.201	0.265	0.255
	Chromium (Cr) (mg/kg)	23.0	21.3	17.0	13.8	13.3
	Copper (Cu) (mg/kg)	24.8	18.5	13.3	8.31	7.49
	Lead (Pb) (mg/kg)	7.20	4.83	3.94	2.43	1.83
	Mercury (Hg) (mg/kg)	0.0417	0.0255	0.0206	0.0118	0.0103
	Nickel (Ni) (mg/kg)	18.6	16.9	13.3	8.71	7.87
	Zinc (Zn) (mg/kg)	71.0	60.3	47.2	32.0	28.8
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.0050	<0.0050	<0.0050		
	Acenaphthylene (mg/kg)	<0.0050	<0.0050	<0.0050		
	Anthracene (mg/kg)	0.0058	<0.0040	<0.0040		
	Benz(a)anthracene (mg/kg)	0.014	<0.010	<0.010		
	Benzo(a)pyrene (mg/kg)	<0.010	<0.010	<0.010		
	Benzo(b&j)fluoranthene (mg/kg)	0.018	<0.010	<0.010		
	Benzo(g,h,i)perylene (mg/kg)	<0.010	<0.010	<0.010		
	Benzo(k)fluoranthene (mg/kg)	<0.010	<0.010	<0.010		
	Chrysene (mg/kg)	0.018	<0.010	<0.010		
	Dibenz(a,h)anthracene (mg/kg)	<0.0050	<0.0050	<0.0050		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1730019-6 SEDIMENT 29-JAN-16 12:14 PCL31 (0-0.5)	L1730019-7 SEDIMENT 29-JAN-16 12:30 PCL31 (0.5-1.0)	L1730019-8 SEDIMENT 29-JAN-16 12:40 PCL31 (1.0-1.25)	L1730019-9 SEDIMENT 29-JAN-16 15:31 PCL14 (0-0.5)	L1730019-10 SEDIMENT 29-JAN-16 15:43 PCL14 (0.5-1.0)
SOIL						
Physical Tests	% Moisture (%)					
	Moisture (%)	22.2	20.4	20.9	36.1	33.3
Particle Size	% Gravel (>2mm) (%)	0.73	2.62	4.03	<0.10	4.79
	% Sand (2.00mm - 1.00mm) (%)	2.04	5.09	5.07	0.13	2.25
	% Sand (1.00mm - 0.50mm) (%)	6.69	7.28	8.13	0.24	1.72
	% Sand (0.50mm - 0.25mm) (%)	24.1	24.4	21.9	0.28	1.60
	% Sand (0.25mm - 0.125mm) (%)	35.0	35.8	32.9	0.84	4.38
	% Sand (0.125mm - 0.063mm) (%)	11.9	12.7	13.5	3.83	14.2
	% Silt (0.063mm - 0.0312mm) (%)	5.95	4.55	5.48	16.6	17.5
	% Silt (0.0312mm - 0.004mm) (%)	8.47	4.27	5.43	46.3	33.2
	% Clay (<4um) (%)	5.08	3.32	3.65	31.7	20.3
	Texture	Loamy sand	Sand	Sand	Silt loam	Silt loam
Organic / Inorganic Carbon	Total Organic Carbon (%)	0.75	0.62	0.44	1.16	0.99
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	3070	2240	2440	6510	5540
	% Saturation (%)	35.2	27.1	26.6	69.8	52.2
	Sodium (Na) (mg/kg)	1530	1230	1280	3640	2940
Metals	Arsenic (As) (mg/kg)	4.65	3.49	3.52	12.5	11.7
	Cadmium (Cd) (mg/kg)	0.149	0.083	0.098	0.154	0.169
	Chromium (Cr) (mg/kg)	15.3	14.3	14.8	32.9	27.1
	Copper (Cu) (mg/kg)	13.3	7.02	5.68	38.1	26.2
	Lead (Pb) (mg/kg)	6.05	2.34	1.89	9.52	6.39
	Mercury (Hg) (mg/kg)	0.0182	0.0097	0.0091	0.0581	0.0427
	Nickel (Ni) (mg/kg)	9.64	6.79	6.15	30.9	23.9
	Zinc (Zn) (mg/kg)	48.9	30.1	29.2	104	80.3
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Acenaphthylene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Anthracene (mg/kg)	0.0092	<0.0040	<0.0040	<0.0040	<0.0040
	Benz(a)anthracene (mg/kg)	0.019	<0.010	<0.010	<0.010	<0.010
	Benzo(a)pyrene (mg/kg)	0.015	<0.010	<0.010	<0.010	<0.010
	Benzo(b&j)fluoranthene (mg/kg)	0.023	<0.010	<0.010	0.015	<0.010
	Benzo(g,h,i)perylene (mg/kg)	0.011	<0.010	<0.010	<0.010	<0.010
	Benzo(k)fluoranthene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Chrysene (mg/kg)	0.021	<0.010	<0.010	0.016	<0.010
	Dibenz(a,h)anthracene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1730019-11 SEDIMENT 29-JAN-16 15:51 PCL14 (1.0-1.5)	L1730019-12 SEDIMENT 29-JAN-16 16:00 PCL14 (1.5-2.0)	L1730019-13 SEDIMENT 29-JAN-16 16:19 PCS14 (0-0.2)	L1730019-14 SEDIMENT 29-JAN-16 16:26 PCS14 (0.2-0.4)	L1730019-15 SEDIMENT 29-JAN-16 16:28 PCS14 (0.4-0.6)
SOIL						
Physical Tests	% Moisture (%)		14.5	40.7	38.5	34.1
	Moisture (%)	26.0				
Particle Size	% Gravel (>2mm) (%)	3.89	2.45	0.35	<0.10	<0.10
	% Sand (2.00mm - 1.00mm) (%)	5.43	3.28	0.20	<0.10	<0.10
	% Sand (1.00mm - 0.50mm) (%)	6.02	5.31	0.12	0.12	0.13
	% Sand (0.50mm - 0.25mm) (%)	8.39	9.53	0.10	<0.10	0.10
	% Sand (0.25mm - 0.125mm) (%)	16.6	18.6	0.31	0.29	0.39
	% Sand (0.125mm - 0.063mm) (%)	22.1	27.8	2.38	1.92	2.01
	% Silt (0.063mm - 0.0312mm) (%)	12.0	14.1	16.4	17.1	17.3
	% Silt (0.0312mm - 0.004mm) (%)	15.0	12.0	46.4	47.3	47.2
	% Clay (<4um) (%)	10.7	6.91	33.8	33.1	32.9
	Texture	Sandy loam	Sandy loam	Silty clay loam	Silt loam / Silty clay loam	Silt loam / Silty clay loam
Organic / Inorganic Carbon	Total Organic Carbon (%)	0.82		1.41	1.16	1.14
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	4050				
	% Saturation (%)	33.9				
	Sodium (Na) (mg/kg)	2040				
Metals	Arsenic (As) (mg/kg)	8.14	3.71			
	Cadmium (Cd) (mg/kg)	0.208	0.122			
	Chromium (Cr) (mg/kg)	20.0	15.2			
	Copper (Cu) (mg/kg)	16.1	13.0			
	Lead (Pb) (mg/kg)	3.90	2.31			
	Mercury (Hg) (mg/kg)	0.0201	0.0121			
	Nickel (Ni) (mg/kg)	16.3	11.1			
	Zinc (Zn) (mg/kg)	53.5	33.8			
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.0050				
	Acenaphthylene (mg/kg)	<0.0050				
	Anthracene (mg/kg)	<0.0040				
	Benz(a)anthracene (mg/kg)	<0.010				
	Benzo(a)pyrene (mg/kg)	<0.010				
	Benzo(b&j)fluoranthene (mg/kg)	<0.010				
	Benzo(g,h,i)perylene (mg/kg)	<0.010				
	Benzo(k)fluoranthene (mg/kg)	<0.010				
	Chrysene (mg/kg)	<0.010				
	Dibenz(a,h)anthracene (mg/kg)	<0.0050				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1730019-16	L1730019-17	L1730019-22	L1730019-23	L1730019-24
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16
Sampled Time	16:35	16:38			
Client ID	PCS14 (0.6-0.8)	PCS14 (0.8-1.0)	SPLIT 6 (0-0.5)	SPLIT 6 (0.5-1.0)	SPLIT 6 (1.0-1.5)
Grouping / **Analyte**					
SOIL					
Physical Tests % Moisture (%)	34.0	31.2			
Moisture (%)			28.9	28.1	27.8
Particle Size % Gravel (>2mm) (%)	0.73	0.46	2.01	1.00	1.18
% Sand (2.00mm - 1.00mm) (%)	1.07	2.53	3.19	1.93	6.17
% Sand (1.00mm - 0.50mm) (%)	0.30	2.40	2.99	2.93	6.30
% Sand (0.50mm - 0.25mm) (%)	0.34	2.41	4.74	4.64	9.38
% Sand (0.25mm - 0.125mm) (%)	0.72	5.62	18.2	19.7	29.6
% Sand (0.125mm - 0.063mm) (%)	2.09	13.5	16.6	17.1	13.6
% Silt (0.063mm - 0.0312mm) (%)	19.4	19.4	11.7	11.8	7.60
% Silt (0.0312mm - 0.004mm) (%)	45.3	34.0	23.6	22.8	13.8
% Clay (<4um) (%)	30.0	19.7	17.1	18.2	12.4
Texture	Silt loam	Silt loam	Loam	Loam	Sandy loam
Organic / Inorganic Carbon Total Organic Carbon (%)	1.10	0.99	1.12	1.03	0.91
Saturated Paste Extractables Chloride (Cl) (mg/kg)			4570	4470	4050
% Saturation (%)			57.4	53.9	43.4
Sodium (Na) (mg/kg)			2380	2530	2050
Metals Arsenic (As) (mg/kg)			9.25	12.9	8.12
Cadmium (Cd) (mg/kg)			0.157	0.156	0.185
Chromium (Cr) (mg/kg)			23.8	23.4	17.5
Copper (Cu) (mg/kg)			21.8	18.9	13.9
Lead (Pb) (mg/kg)			5.73	4.78	3.73
Mercury (Hg) (mg/kg)			0.0394	0.0289	0.0216
Nickel (Ni) (mg/kg)			18.0	19.0	13.5
Zinc (Zn) (mg/kg)			64.4	60.0	48.4
Polycyclic Aromatic Hydrocarbons Acenaphthene (mg/kg)			<0.0050	<0.0050	<0.0050
Acenaphthylene (mg/kg)			<0.0050	<0.0050	<0.0050
Anthracene (mg/kg)			0.0050	<0.0040	<0.0040
Benz(a)anthracene (mg/kg)			0.014	<0.010	<0.010
Benzo(a)pyrene (mg/kg)			<0.010	<0.010	<0.010
Benzo(b&j)fluoranthene (mg/kg)			0.016	<0.010	<0.010
Benzo(g,h,i)perylene (mg/kg)			<0.010	<0.010	<0.010
Benzo(k)fluoranthene (mg/kg)			<0.010	<0.010	<0.010
Chrysene (mg/kg)			0.018	<0.010	<0.010
Dibenz(a,h)anthracene (mg/kg)			<0.0050	<0.0050	<0.0050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1730019-25	L1730019-26	L1730019-27	L1730019-28	L1730019-29
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	29-JAN-16	29-JAN-16	30-JAN-16	30-JAN-16	30-JAN-16
Sampled Time			11:30	11:39	11:46
Client ID	SPLIT 6 (1.5-2.0)	SPLIT 6 (2.0-2.16)	PCL12 (0-0.5)	PCL12 (0.5-1.0)	PCL12 (1.0-1.3)
Grouping **Analyte**					
SOIL					
Physical Tests % Moisture (%)	23.5	20.4			
Moisture (%)			38.5	37.0	29.8
Particle Size % Gravel (>2mm) (%)	1.90	3.43	0.31	3.04	5.61
% Sand (2.00mm - 1.00mm) (%)	5.32	5.78	0.40	4.38	8.32
% Sand (1.00mm - 0.50mm) (%)	5.85	5.56	0.39	2.64	6.11
% Sand (0.50mm - 0.25mm) (%)	8.70	8.17	0.43	2.61	7.14
% Sand (0.25mm - 0.125mm) (%)	37.5	31.4	0.49	2.68	9.31
% Sand (0.125mm - 0.063mm) (%)	19.6	26.0	1.65	4.79	8.99
% Silt (0.063mm - 0.0312mm) (%)	6.91	8.17	17.2	14.6	14.7
% Silt (0.0312mm - 0.004mm) (%)	7.11	6.05	48.7	39.0	25.4
% Clay (<4um) (%)	7.17	5.51	30.4	26.3	14.5
Texture	Loamy sand	Loamy sand	Silt loam	Silt loam	Loam
Organic / Inorganic Carbon Total Organic Carbon (%)			1.28	1.05	0.88
Saturated Paste Extractables Chloride (Cl) (mg/kg)			7010	7740	5450
% Saturation (%)			67.6	61.0	42.7
Sodium (Na) (mg/kg)			3640	4320	3030
Metals Arsenic (As) (mg/kg)			12.0	12.8	10.3
Cadmium (Cd) (mg/kg)			0.146	0.195	0.151
Chromium (Cr) (mg/kg)			32.0	32.7	21.0
Copper (Cu) (mg/kg)			39.1	37.4	19.2
Lead (Pb) (mg/kg)			10.5	8.82	5.13
Mercury (Hg) (mg/kg)			0.0577	0.0421	0.0281
Nickel (Ni) (mg/kg)			30.5	31.7	18.3
Zinc (Zn) (mg/kg)			103	105	63.2
Polycyclic Aromatic Hydrocarbons Acenaphthene (mg/kg)			<0.0050	<0.0050	<0.0050
Acenaphthylene (mg/kg)			<0.0050	<0.0050	<0.0050
Anthracene (mg/kg)			0.0048	<0.0040	<0.0040
Benz(a)anthracene (mg/kg)			0.011	<0.010	<0.010
Benzo(a)pyrene (mg/kg)			<0.010	<0.010	<0.010
Benzo(b&j)fluoranthene (mg/kg)			0.017	<0.010	<0.010
Benzo(g,h,i)perylene (mg/kg)			<0.010	<0.010	<0.010
Benzo(k)fluoranthene (mg/kg)			<0.010	<0.010	<0.010
Chrysene (mg/kg)			0.017	<0.010	<0.010
Dibenz(a,h)anthracene (mg/kg)			<0.0050	<0.0050	<0.0050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1730019-30 SEDIMENT 30-JAN-16 12:00 PCL13 (0-0.5)	L1730019-31 SEDIMENT 30-JAN-16 12:03 PCL13 (0.5-1.0)	L1730019-32 SEDIMENT 30-JAN-16 12:13 PCL13 (1.0-1.3)	L1730019-33 SEDIMENT 30-JAN-16 12:22 PCS13 (0-0.2)	L1730019-34 SEDIMENT 30-JAN-16 12:27 PCS13 (0.2-0.4)
SOIL						
Physical Tests	% Moisture (%)				35.1	30.2
	Moisture (%)	31.9	29.4	27.3		
Particle Size	% Gravel (>2mm) (%)	2.79	5.47	8.67	0.57	6.31
	% Sand (2.00mm - 1.00mm) (%)	8.03	12.7	19.1	2.26	11.2
	% Sand (1.00mm - 0.50mm) (%)	10.6	13.2	16.4	5.62	10.1
	% Sand (0.50mm - 0.25mm) (%)	10.1	11.0	11.8	5.92	8.98
	% Sand (0.25mm - 0.125mm) (%)	7.58	10.4	9.67	4.25	7.00
	% Sand (0.125mm - 0.063mm) (%)	7.48	7.91	7.74	4.80	6.46
	% Silt (0.063mm - 0.0312mm) (%)	11.3	10.6	6.32	12.9	10.1
	% Silt (0.0312mm - 0.004mm) (%)	24.5	17.8	11.3	36.2	23.2
	% Clay (<4um) (%)	17.6	11.0	9.03	27.4	16.8
	Texture	Loam	Sandy loam	Sandy loam	Silt loam	Loam
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.26	0.93	0.75	1.44	1.14
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	5450	5250	3580		
	% Saturation (%)	45.3	37.6	32.2		
	Sodium (Na) (mg/kg)	2880	2730	1840		
Metals	Arsenic (As) (mg/kg)	8.00	7.00	6.39		
	Cadmium (Cd) (mg/kg)	0.189	0.185	0.189		
	Chromium (Cr) (mg/kg)	19.8	15.6	12.9		
	Copper (Cu) (mg/kg)	21.2	15.3	11.6		
	Lead (Pb) (mg/kg)	6.10	4.51	4.09		
	Mercury (Hg) (mg/kg)	0.0356	0.0267	0.0251		
	Nickel (Ni) (mg/kg)	17.9	13.6	11.0		
	Zinc (Zn) (mg/kg)	62.5	47.9	39.4		
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.0050	<0.0050	<0.0050		
	Acenaphthylene (mg/kg)	<0.0050	<0.0050	<0.0050		
	Anthracene (mg/kg)	<0.0040	<0.0040	<0.0040		
	Benz(a)anthracene (mg/kg)	<0.010	<0.010	<0.010		
	Benzo(a)pyrene (mg/kg)	<0.010	<0.010	<0.010		
	Benzo(b&j)fluoranthene (mg/kg)	<0.010	<0.010	<0.010		
	Benzo(g,h,i)perylene (mg/kg)	<0.010	<0.010	<0.010		
	Benzo(k)fluoranthene (mg/kg)	<0.010	<0.010	<0.010		
	Chrysene (mg/kg)	<0.010	<0.010	<0.010		
	Dibenz(a,h)anthracene (mg/kg)	<0.0050	<0.0050	<0.0050		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1730019-35	L1730019-36	L1730019-37	L1730019-38	L1730019-39
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	30-JAN-16	30-JAN-16	30-JAN-16	30-JAN-16	30-JAN-16
Sampled Time	12:32	15:57	16:02	16:07	14:42
Client ID	PCS13 (0.4-0.7)	PCL04 (0-0.5)	PCL04 (0.5-1.0)	PCL04 (1.0-1.5)	SS05
Grouping / **Analyte**					
SOIL					
Physical Tests / % Moisture (%)	31.4				
Moisture (%)		28.6	25.1	18.0	44.8
Particle Size / % Gravel (>2mm) (%)	5.04	0.92	3.39	6.75	3.32
% Sand (2.00mm - 1.00mm) (%)	8.71	2.21	6.11	5.04	4.18
% Sand (1.00mm - 0.50mm) (%)	9.50	3.26	11.3	8.85	3.43
% Sand (0.50mm - 0.25mm) (%)	7.55	6.52	21.9	19.8	2.45
% Sand (0.25mm - 0.125mm) (%)	5.46	23.2	24.1	15.7	2.13
% Sand (0.125mm - 0.063mm) (%)	7.25	9.12	7.05	7.17	3.44
% Silt (0.063mm - 0.0312mm) (%)	12.2	10.7	5.62	7.46	14.0
% Silt (0.0312mm - 0.004mm) (%)	26.2	25.1	11.2	15.0	37.6
% Clay (<4um) (%)	18.1	18.9	9.39	14.3	29.4
Texture	Loam	Loam	Sandy loam	Sandy loam	Silt loam
Organic / Inorganic Carbon / Total Organic Carbon (%)	1.34	1.03	0.63	0.44	1.42
Saturated Paste Extractables / Chloride (Cl) (mg/kg)		5090	2800	2380	9320
% Saturation (%)		46.7	29.1	27.5	66.5
Sodium (Na) (mg/kg)		2700	1400	1190	5000
Metals / Arsenic (As) (mg/kg)		9.37	7.72	4.78	8.26
Cadmium (Cd) (mg/kg)		0.155	0.227	0.204	0.190
Chromium (Cr) (mg/kg)		19.0	15.4	21.6	26.9
Copper (Cu) (mg/kg)		21.4	13.4	20.0	33.3
Lead (Pb) (mg/kg)		5.56	3.90	3.03	9.36
Mercury (Hg) (mg/kg)		0.0339	0.0202	0.0149	0.0583
Nickel (Ni) (mg/kg)		16.9	13.1	15.9	25.6
Zinc (Zn) (mg/kg)		60.3	44.8	52.9	87.3
Polycyclic Aromatic Hydrocarbons / Acenaphthene (mg/kg)		<0.0050	<0.0050	<0.0050	<0.0050
Acenaphthylene (mg/kg)		<0.0050	<0.0050	<0.0050	<0.0050
Anthracene (mg/kg)		0.0048	<0.0040	<0.0040	0.0059
Benz(a)anthracene (mg/kg)		0.012	<0.010	<0.010	<0.010
Benzo(a)pyrene (mg/kg)		<0.010	<0.010	<0.010	<0.010
Benzo(b&j)fluoranthene (mg/kg)		0.017	<0.010	<0.010	0.015
Benzo(g,h,i)perylene (mg/kg)		<0.010	<0.010	<0.010	<0.010
Benzo(k)fluoranthene (mg/kg)		<0.010	<0.010	<0.010	<0.010
Chrysene (mg/kg)		0.018	<0.010	<0.010	0.016
Dibenz(a,h)anthracene (mg/kg)		<0.0050	<0.0050	<0.0050	<0.0050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-40	L1730019-41	L1730019-42	L1730019-43	L1730019-44
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	30-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16
	Sampled Time	14:50	12:12	12:18	12:25	12:41
	Client ID	SS06	PCL02 (0-0.5)	PCL02 (0.5-1.0)	PCL02 (1.0-1.3)	PCS02 (0-0.2)
Grouping	**Analyte**					
SOIL						
Physical Tests	% Moisture (%)					33.4
	Moisture (%)	46.9	31.8	24.4	20.5	
Particle Size	% Gravel (>2mm) (%)	1.34	0.96	7.00	16.0	0.43
	% Sand (2.00mm - 1.00mm) (%)	1.35	1.78	5.29	7.51	2.27
	% Sand (1.00mm - 0.50mm) (%)	0.85	2.51	8.40	11.2	2.12
	% Sand (0.50mm - 0.25mm) (%)	0.51	6.60	13.9	18.1	5.16
	% Sand (0.25mm - 0.125mm) (%)	0.91	28.5	29.9	21.2	22.8
	% Sand (0.125mm - 0.063mm) (%)	2.65	9.73	8.98	6.71	9.12
	% Silt (0.063mm - 0.0312mm) (%)	15.6	9.40	6.45	4.70	10.6
	% Silt (0.0312mm - 0.004mm) (%)	46.3	22.3	10.7	7.48	25.8
	% Clay (<4um) (%)	30.5	18.3	9.46	7.19	21.7
	Texture	Silt loam	Loam	Sandy loam	Loamy sand	Loam
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.47	1.22	0.75	0.56	1.27
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	10800	5890	3750	3180	
	% Saturation (%)	72.5	46.4	32.8	25.6	
	Sodium (Na) (mg/kg)	5710	3140	2040	1770	
Metals	Arsenic (As) (mg/kg)	10.8	8.23	6.34	3.53	
	Cadmium (Cd) (mg/kg)	0.150	0.123	0.214	0.195	
	Chromium (Cr) (mg/kg)	30.3	21.0	17.2	15.0	
	Copper (Cu) (mg/kg)	35.2	22.7	14.4	11.7	
	Lead (Pb) (mg/kg)	9.61	6.40	3.76	2.70	
	Mercury (Hg) (mg/kg)	0.0628	0.0356	0.0201	0.0141	
	Nickel (Ni) (mg/kg)	27.7	17.5	13.6	10.7	
	Zinc (Zn) (mg/kg)	98.2	66.0	48.0	38.4	
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	
	Acenaphthylene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	
	Anthracene (mg/kg)	0.0060	0.0049	<0.0040	<0.0040	
	Benz(a)anthracene (mg/kg)	0.013	0.012	<0.010	<0.010	
	Benzo(a)pyrene (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Benzo(b&j)fluoranthene (mg/kg)	0.020	0.015	<0.010	<0.010	
	Benzo(g,h,i)perylene (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Benzo(k)fluoranthene (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Chrysene (mg/kg)	0.023	0.020	<0.010	<0.010	
	Dibenz(a,h)anthracene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-45	L1730019-46	L1730019-47	L1730019-48	L1730019-49
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	31-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16
	Sampled Time	12:48	12:53	12:58	17:59	18:08
	Client ID	PCS02 (0.2-0.4)	PCS02 (0.4-0.6)	PCS02 (0.6-0.68)	PCL05 (0-0.5)	PCL05 (0.5-1.0)
Grouping	**Analyte**					
SOIL						
Physical Tests	% Moisture (%)	21.7	21.8	21.4		
	Moisture (%)				28.6	32.3
Particle Size	% Gravel (>2mm) (%)	3.61	3.64	4.88	1.30	8.80
	% Sand (2.00mm - 1.00mm) (%)	5.06	8.43	10.7	3.78	6.54
	% Sand (1.00mm - 0.50mm) (%)	6.06	9.01	12.4	4.80	10.2
	% Sand (0.50mm - 0.25mm) (%)	9.42	13.2	16.0	8.49	18.5
	% Sand (0.25mm - 0.125mm) (%)	32.9	30.4	27.6	34.5	26.0
	% Sand (0.125mm - 0.063mm) (%)	10.2	9.76	8.68	9.87	7.59
	% Silt (0.063mm - 0.0312mm) (%)	8.08	6.21	4.77	8.02	5.61
	% Silt (0.0312mm - 0.004mm) (%)	13.7	9.63	6.96	15.3	9.16
	% Clay (<4um) (%)	11.0	9.68	7.92	14.0	7.72
	Texture	Sandy loam	Sandy loam	Loamy sand	Sandy loam	Sandy loam / Loamy sand
Organic / Inorganic Carbon	Total Organic Carbon (%)	0.79	0.65	0.78	0.80	0.75
Saturated Paste Extractables	Chloride (Cl) (mg/kg)				4500	5380
	% Saturation (%)				38.1	48.7
	Sodium (Na) (mg/kg)				2480	3020
Metals	Arsenic (As) (mg/kg)				7.61	10.8
	Cadmium (Cd) (mg/kg)				0.145	0.177
	Chromium (Cr) (mg/kg)				15.9	23.3
	Copper (Cu) (mg/kg)				15.4	25.2
	Lead (Pb) (mg/kg)				4.40	5.21
	Mercury (Hg) (mg/kg)				0.0247	0.0331
	Nickel (Ni) (mg/kg)				13.3	19.0
	Zinc (Zn) (mg/kg)				48.9	69.1
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)				<0.0050	<0.0050
	Acenaphthylene (mg/kg)				<0.0050	<0.0050
	Anthracene (mg/kg)				<0.0040	<0.0040
	Benz(a)anthracene (mg/kg)				<0.010	<0.010
	Benzo(a)pyrene (mg/kg)				<0.010	<0.010
	Benzo(b&j)fluoranthene (mg/kg)				0.011	<0.010
	Benzo(g,h,i)perylene (mg/kg)				<0.010	<0.010
	Benzo(k)fluoranthene (mg/kg)				<0.010	<0.010
	Chrysene (mg/kg)				0.013	<0.010
	Dibenz(a,h)anthracene (mg/kg)				<0.0050	<0.0050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1730019-50 SEDIMENT 31-JAN-16 17:18 PCL06 (0-0.5)	L1730019-51 SEDIMENT 31-JAN-16 17:25 PCL06 (0.5-1.0)	L1730019-52 SEDIMENT 31-JAN-16 17:31 PCL06 (1.0-1.5)	L1730019-53 SEDIMENT 31-JAN-16 17:42 PCL06 (1.5-2.0)	L1730019-54 SEDIMENT 31-JAN-16 17:47 PCL06 (2.0-2.4)
SOIL						
Physical Tests	% Moisture (%)				36.3	32.3
	Moisture (%)	38.4	30.3	35.0		
Particle Size	% Gravel (>2mm) (%)	<0.10	1.37	1.15	0.43	1.62
	% Sand (2.00mm - 1.00mm) (%)	0.34	2.47	1.02	0.66	0.86
	% Sand (1.00mm - 0.50mm) (%)	0.26	0.91	0.73	0.53	0.84
	% Sand (0.50mm - 0.25mm) (%)	0.64	1.74	1.40	0.83	1.15
	% Sand (0.25mm - 0.125mm) (%)	6.88	21.8	22.3	15.3	20.3
	% Sand (0.125mm - 0.063mm) (%)	9.37	15.5	15.1	16.0	15.0
	% Silt (0.063mm - 0.0312mm) (%)	15.2	14.6	13.8	15.2	13.4
	% Silt (0.0312mm - 0.004mm) (%)	37.9	24.7	24.9	29.6	25.4
	% Clay (<4um) (%)	29.2	17.0	19.6	21.5	21.4
	Texture	Silt loam	Loam	Loam	Loam	Loam
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.71	1.40	1.47		
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	7650		5050		
	% Saturation (%)	65.5		49.9		
	Sodium (Na) (mg/kg)	4470		2630		
Metals	Arsenic (As) (mg/kg)	11.6	10.4	10.8	11.9	11.0
	Cadmium (Cd) (mg/kg)	0.209	0.191	0.197	0.232	0.213
	Chromium (Cr) (mg/kg)	27.6	22.2	23.1	26.5	27.8
	Copper (Cu) (mg/kg)	40.8	24.4	22.5	27.1	26.2
	Lead (Pb) (mg/kg)	9.92	5.79	5.34	6.25	5.98
	Mercury (Hg) (mg/kg)	0.0670	0.0375	0.0340	0.0454	0.0342
	Nickel (Ni) (mg/kg)	25.1	19.1	19.3	22.2	22.7
	Zinc (Zn) (mg/kg)	92.2	69.1	67.3	76.8	79.2
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.0050	<0.0050	<0.0050		
	Acenaphthylene (mg/kg)	<0.0050	<0.0050	<0.0050		
	Anthracene (mg/kg)	0.0109	<0.0040	<0.0040		
	Benz(a)anthracene (mg/kg)	0.023	<0.010	<0.010		
	Benzo(a)pyrene (mg/kg)	0.022	<0.010	<0.010		
	Benzo(b&j)fluoranthene (mg/kg)	0.038	<0.010	<0.010		
	Benzo(g,h,i)perylene (mg/kg)	0.018	<0.010	<0.010		
	Benzo(k)fluoranthene (mg/kg)	0.012	<0.010	<0.010		
	Chrysene (mg/kg)	0.036	<0.010	<0.010		
	Dibenz(a,h)anthracene (mg/kg)	<0.0050	<0.0050	<0.0050		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1730019-55 SEDIMENT 31-JAN-16 15:58 PCS06 (0-0.2)	L1730019-56 SEDIMENT 31-JAN-16 16:02 PCS06 (0.2-0.4)	L1730019-57 SEDIMENT 31-JAN-16 16:08 PCS06 (0.4-0.6)	L1730019-58 SEDIMENT 31-JAN-16 16:13 PCS06 (0.6-0.8)	L1730019-59 SEDIMENT 31-JAN-16 16:21 PCS06 (0.8-1.0)
SOIL						
Physical Tests	% Moisture (%)	41.6	37.5	32.6	32.2	32.7
	Moisture (%)					
Particle Size	% Gravel (>2mm) (%)	0.12	0.10	0.73	0.21	0.79
	% Sand (2.00mm - 1.00mm) (%)	0.27	0.29	0.65	0.96	1.82
	% Sand (1.00mm - 0.50mm) (%)	0.29	0.35	0.42	0.73	0.80
	% Sand (0.50mm - 0.25mm) (%)	0.66	0.53	0.76	1.19	1.07
	% Sand (0.25mm - 0.125mm) (%)	6.43	10.2	14.5	16.7	16.9
	% Sand (0.125mm - 0.063mm) (%)	8.10	9.48	13.9	15.2	15.2
	% Silt (0.063mm - 0.0312mm) (%)	15.4	14.4	15.6	15.2	14.6
	% Silt (0.0312mm - 0.004mm) (%)	39.0	36.1	31.5	28.9	28.1
	% Clay (<4um) (%)	29.7	28.4	21.9	20.9	20.8
	Texture	Silt loam	Silt loam	Loam	Loam	Loam
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.74	1.68	1.42	1.44	1.45
Saturated Paste Extractables	Chloride (Cl) (mg/kg)					
	% Saturation (%)					
	Sodium (Na) (mg/kg)					
Metals	Arsenic (As) (mg/kg)					
	Cadmium (Cd) (mg/kg)					
	Chromium (Cr) (mg/kg)					
	Copper (Cu) (mg/kg)					
	Lead (Pb) (mg/kg)					
	Mercury (Hg) (mg/kg)					
	Nickel (Ni) (mg/kg)					
	Zinc (Zn) (mg/kg)					
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)					
	Acenaphthylene (mg/kg)					
	Anthracene (mg/kg)					
	Benz(a)anthracene (mg/kg)					
	Benzo(a)pyrene (mg/kg)					
	Benzo(b&j)fluoranthene (mg/kg)					
	Benzo(g,h,i)perylene (mg/kg)					
	Benzo(k)fluoranthene (mg/kg)					
	Chrysene (mg/kg)					
	Dibenz(a,h)anthracene (mg/kg)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-68				
	Description	SEDIMENT				
	Sampled Date	31-JAN-16				
	Sampled Time	18:17				
	Client ID	PCL05 (1.0-1.2)				
Grouping	**Analyte**					
SOIL						
Physical Tests	% Moisture (%)					
	Moisture (%)	17.3				
Particle Size	% Gravel (>2mm) (%)	6.80				
	% Sand (2.00mm - 1.00mm) (%)	7.77				
	% Sand (1.00mm - 0.50mm) (%)	11.8				
	% Sand (0.50mm - 0.25mm) (%)	18.0				
	% Sand (0.25mm - 0.125mm) (%)	17.2				
	% Sand (0.125mm - 0.063mm) (%)	11.4				
	% Silt (0.063mm - 0.0312mm) (%)	9.96				
	% Silt (0.0312mm - 0.004mm) (%)	11.5				
	% Clay (<4um) (%)	5.61				
	Texture	Sandy loam				
Organic / Inorganic Carbon	Total Organic Carbon (%)	0.38				
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	2540				
	% Saturation (%)	22.6				
	Sodium (Na) (mg/kg)	1340				
Metals	Arsenic (As) (mg/kg)	3.58				
	Cadmium (Cd) (mg/kg)	0.294				
	Chromium (Cr) (mg/kg)	17.3				
	Copper (Cu) (mg/kg)	15.7				
	Lead (Pb) (mg/kg)	2.02				
	Mercury (Hg) (mg/kg)	0.0082				
	Nickel (Ni) (mg/kg)	11.6				
	Zinc (Zn) (mg/kg)	33.1				
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.0050				
	Acenaphthylene (mg/kg)	<0.0050				
	Anthracene (mg/kg)	<0.0040				
	Benz(a)anthracene (mg/kg)	<0.010				
	Benzo(a)pyrene (mg/kg)	<0.010				
	Benzo(b&j)fluoranthene (mg/kg)	<0.010				
	Benzo(g,h,i)perylene (mg/kg)	<0.010				
	Benzo(k)fluoranthene (mg/kg)	<0.010				
	Chrysene (mg/kg)	<0.010				
	Dibenz(a,h)anthracene (mg/kg)	<0.0050				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-1	L1730019-2	L1730019-3	L1730019-4	L1730019-5
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16
	Sampled Time	11:23	11:37	11:48	11:57	12:04
	Client ID	PCL30 (0-0.5)	PCL30 (0.5-1.0)	PCL30 (1.0-1.5)	PCL30 (1.5-2.0)	PCL30 (2.0-2.16)
Grouping	**Analyte**					
SOIL						
Polycyclic	Fluoranthene (mg/kg)	0.023	<0.010	<0.010		
	Fluorene (mg/kg)	<0.010	<0.010	<0.010		
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.010	<0.010	<0.010		
	Naphthalene (mg/kg)	<0.010	<0.010	<0.010		
	Phenanthrene (mg/kg)	0.020	<0.010	<0.010		
	Pyrene (mg/kg)	0.023	<0.010	<0.010		
	Surrogate: d10-Acenaphthene (%)	85.8	81.0	77.7		
	Surrogate: d12-Chrysene (%)	92.4	96.2	86.1		
	Surrogate: d10-Phenanthrene (%)	89.0	92.9	82.2		
	Total PAHs (mg/kg)	0.104	<0.035	<0.035		
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1221 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1232 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1242 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1248 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1254 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1260 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1262 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1268 (mg/kg)	<0.020	<0.020	<0.020		
	Total PCB (BC CSR) (mg/kg)	<0.020	<0.020	<0.020		
	Total Polychlorinated Biphenyls (mg/kg)	<0.020	<0.020	<0.020		
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)					
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)					
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)					
	TEF Reference					
	TEF Species					
	2,3,7,8-TCDD (pg/g)					
	1,2,3,7,8-PeCDD (pg/g)					
	1,2,3,4,7,8-HxCDD (pg/g)					
	1,2,3,6,7,8-HxCDD (pg/g)					
	1,2,3,7,8,9-HxCDD (pg/g)					
	1,2,3,4,6,7,8-HpCDD (pg/g)					
	OCDD (pg/g)					
	Total-TCDD (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-6	L1730019-7	L1730019-8	L1730019-9	L1730019-10
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16
	Sampled Time	12:14	12:30	12:40	15:31	15:43
	Client ID	PCL31 (0-0.5)	PCL31 (0.5-1.0)	PCL31 (1.0-1.25)	PCL14 (0-0.5)	PCL14 (0.5-1.0)
Grouping	**Analyte**					
SOIL						
Polycyclic	Fluoranthene (mg/kg)	0.047	<0.010	<0.010	0.024	<0.010
	Fluorene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Naphthalene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Phenanthrene (mg/kg)	0.033	<0.010	<0.010	0.024	0.010
	Pyrene (mg/kg)	0.044	<0.010	<0.010	0.018	<0.010
	Surrogate: d10-Acenaphthene (%)	77.3	76.1	81.9	83.4	78.4
	Surrogate: d12-Chrysene (%)	93.2	96.8	96.3	91.4	95.5
	Surrogate: d10-Phenanthrene (%)	92.1	86.2	87.3	89.1	89.3
	Total PAHs (mg/kg)	0.199	<0.035	<0.035	0.081	<0.035
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1221 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1232 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1242 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1248 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1254 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1260 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1262 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1268 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Total PCB (BC CSR) (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Total Polychlorinated Biphenyls (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)					
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)					
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)					
	TEF Reference					
	TEF Species					
	2,3,7,8-TCDD (pg/g)					
	1,2,3,7,8-PeCDD (pg/g)					
	1,2,3,4,7,8-HxCDD (pg/g)					
	1,2,3,6,7,8-HxCDD (pg/g)					
	1,2,3,7,8,9-HxCDD (pg/g)					
	1,2,3,4,6,7,8-HpCDD (pg/g)					
	OCDD (pg/g)					
	Total-TCDD (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1730019-11 SEDIMENT 29-JAN-16 15:51 PCL14 (1.0-1.5)	L1730019-12 SEDIMENT 29-JAN-16 16:00 PCL14 (1.5-2.0)	L1730019-13 SEDIMENT 29-JAN-16 16:19 PCS14 (0-0.2)	L1730019-14 SEDIMENT 29-JAN-16 16:26 PCS14 (0.2-0.4)	L1730019-15 SEDIMENT 29-JAN-16 16:28 PCS14 (0.4-0.6)
SOIL						
Polycyclic	Fluoranthene (mg/kg)	<0.010				
	Fluorene (mg/kg)	<0.010				
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.010				
	Naphthalene (mg/kg)	<0.010				
	Phenanthrene (mg/kg)	<0.010				
	Pyrene (mg/kg)	<0.010				
	Surrogate: d10-Acenaphthene (%)	85.5				
	Surrogate: d12-Chrysene (%)	97.3				
	Surrogate: d10-Phenanthrene (%)	87.1				
	Total PAHs (mg/kg)	<0.035				
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020				
	PCB-1221 (mg/kg)	<0.020				
	PCB-1232 (mg/kg)	<0.020				
	PCB-1242 (mg/kg)	<0.020				
	PCB-1248 (mg/kg)	<0.020				
	PCB-1254 (mg/kg)	<0.020				
	PCB-1260 (mg/kg)	<0.020				
	PCB-1262 (mg/kg)	<0.020				
	PCB-1268 (mg/kg)	<0.020				
	Total PCB (BC CSR) (mg/kg)	<0.020				
	Total Polychlorinated Biphenyls (mg/kg)	<0.020				
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)			0.804162	0.3070377	0.2905506
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)			0.747562	0.2091127	0.2100606
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)			0.561162	0.0600877	0.0706806
	TEF Reference			World Health Organization 1998	World Health Organization 1998	World Health Organization 1998
	TEF Species			Fish	Fish	Fish
	2,3,7,8-TCDD (pg/g)			0.120 M,J,R	<0.087 [U]	<0.080 [U]
	1,2,3,7,8-PeCDD (pg/g)			0.221 M,J	0.050 M,J,R	0.058 M,J,R
	1,2,3,4,7,8-HxCDD (pg/g)			<0.16 [U]	<0.094 [U]	<0.092 [U]
	1,2,3,6,7,8-HxCDD (pg/g)			1.85 [J]	0.426 [J]	0.089 J,R
	1,2,3,7,8,9-HxCDD (pg/g)			0.64 J,R	0.110 M,J,R	<0.087 M,U
	1,2,3,4,6,7,8-HpCDD (pg/g)			3.79 [J]	1.16 M,J	0.270 M,J
	OCDD (pg/g)			18.8	5.71 [J]	0.636 [J]
	Total-TCDD (pg/g)			<0.099 [U]	<0.087 [U]	0.792

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1730019-16	L1730019-17	L1730019-22	L1730019-23	L1730019-24
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16
Sampled Time	16:35	16:38			
Client ID	PCS14 (0.6-0.8)	PCS14 (0.8-1.0)	SPLIT 6 (0-0.5)	SPLIT 6 (0.5-1.0)	SPLIT 6 (1.0-1.5)
Grouping / **Analyte**					
SOIL					
Polycyclic Fluoranthene (mg/kg)			0.017	<0.010	<0.010
Fluorene (mg/kg)			<0.010	<0.010	<0.010
Indeno(1,2,3-c,d)pyrene (mg/kg)			<0.010	<0.010	<0.010
Naphthalene (mg/kg)			<0.010	<0.010	0.011
Phenanthrene (mg/kg)			0.013	<0.010	<0.010
Pyrene (mg/kg)			0.017	<0.010	<0.010
Surrogate: d10-Acenaphthene (%)			85.2	91.7	76.5
Surrogate: d12-Chrysene (%)			97.2	95.0	92.9
Surrogate: d10-Phenanthrene (%)			92.5	94.4	88.1
Total PAHs (mg/kg)			0.083	<0.035	<0.035
Polychlorinated Biphenyls PCB-1016 (mg/kg)			<0.020	<0.020	<0.020
PCB-1221 (mg/kg)			<0.020	<0.020	<0.020
PCB-1232 (mg/kg)			<0.020	<0.020	<0.020
PCB-1242 (mg/kg)			<0.020	<0.020	<0.020
PCB-1248 (mg/kg)			<0.020	<0.020	<0.020
PCB-1254 (mg/kg)			<0.020	<0.020	<0.020
PCB-1260 (mg/kg)			<0.020	<0.020	<0.020
PCB-1262 (mg/kg)			<0.020	<0.020	<0.020
PCB-1268 (mg/kg)			<0.020	<0.020	<0.020
Total PCB (BC CSR) (mg/kg)			<0.020	<0.020	<0.020
Total Polychlorinated Biphenyls (mg/kg)			<0.020	<0.020	<0.020
Dioxins and Furans WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)	0.1892307	0.558193			
WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)	0.0985957	0.341443			
WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)	0.0070797	0.105653			
TEF Reference	World Health Organization 1998	World Health Organization 1998			
TEF Species	Fish	Fish			
2,3,7,8-TCDD (pg/g)	<0.064 [U]	<0.17 [U]			
1,2,3,7,8-PeCDD (pg/g)	<0.050 [U]	<0.12 [U]			
1,2,3,4,7,8-HxCDD (pg/g)	<0.061 [U]	<0.18 [U]			
1,2,3,6,7,8-HxCDD (pg/g)	<0.056 M,U	<0.16 M,U			
1,2,3,7,8,9-HxCDD (pg/g)	<0.058 [U]	<0.17 M,U			
1,2,3,4,6,7,8-HpCDD (pg/g)	0.184 M,J	0.69 M,J			
OCDD (pg/g)	0.957 [J]	1.85 M,J			
Total-TCDD (pg/g)	<0.064 [U]	1.76			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1730019-25	L1730019-26	L1730019-27	L1730019-28	L1730019-29
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	29-JAN-16	29-JAN-16	30-JAN-16	30-JAN-16	30-JAN-16
Sampled Time			11:30	11:39	11:46
Client ID	SPLIT 6 (1.5-2.0)	SPLIT 6 (2.0-2.16)	PCL12 (0-0.5)	PCL12 (0.5-1.0)	PCL12 (1.0-1.3)
Grouping **Analyte**					
SOIL					
Polycyclic Fluoranthene (mg/kg)			0.025	<0.010	<0.010
Fluorene (mg/kg)			<0.010	<0.010	<0.010
Indeno(1,2,3-c,d)pyrene (mg/kg)			<0.010	<0.010	<0.010
Naphthalene (mg/kg)			0.010	<0.010	<0.010
Phenanthrene (mg/kg)			0.027	0.012	<0.010
Pyrene (mg/kg)			0.022	<0.010	<0.010
Surrogate: d10-Acenaphthene (%)			79.2	76.7	76.9
Surrogate: d12-Chrysene (%)			89.1	95.5	94.8
Surrogate: d10-Phenanthrene (%)			81.9	81.2	81.3
Total PAHs (mg/kg)			0.118	<0.035	<0.035
Polychlorinated Biphenyls PCB-1016 (mg/kg)			<0.020	<0.020	<0.020
PCB-1221 (mg/kg)			<0.020	<0.020	<0.020
PCB-1232 (mg/kg)			<0.020	<0.020	<0.020
PCB-1242 (mg/kg)			<0.020	<0.020	<0.020
PCB-1248 (mg/kg)			<0.020	<0.020	<0.020
PCB-1254 (mg/kg)			<0.020	<0.020	<0.020
PCB-1260 (mg/kg)			<0.020	<0.020	<0.020
PCB-1262 (mg/kg)			<0.020	<0.020	<0.020
PCB-1268 (mg/kg)			<0.020	<0.020	<0.020
Total PCB (BC CSR) (mg/kg)			<0.020	<0.020	<0.020
Total Polychlorinated Biphenyls (mg/kg)			<0.020	<0.020	<0.020
Dioxins and Furans WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)					
WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)					
WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)					
TEF Reference					
TEF Species					
2,3,7,8-TCDD (pg/g)					
1,2,3,7,8-PeCDD (pg/g)					
1,2,3,4,7,8-HxCDD (pg/g)					
1,2,3,6,7,8-HxCDD (pg/g)					
1,2,3,7,8,9-HxCDD (pg/g)					
1,2,3,4,6,7,8-HpCDD (pg/g)					
OCDD (pg/g)					
Total-TCDD (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1730019-30 SEDIMENT 30-JAN-16 12:00 PCL13 (0-0.5)	L1730019-31 SEDIMENT 30-JAN-16 12:03 PCL13 (0.5-1.0)	L1730019-32 SEDIMENT 30-JAN-16 12:13 PCL13 (1.0-1.3)	L1730019-33 SEDIMENT 30-JAN-16 12:22 PCS13 (0-0.2)	L1730019-34 SEDIMENT 30-JAN-16 12:27 PCS13 (0.2-0.4)
SOIL						
Polycyclic	Fluoranthene (mg/kg)	<0.010	<0.010	<0.010		
	Fluorene (mg/kg)	<0.010	<0.010	<0.010		
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.010	<0.010	<0.010		
	Naphthalene (mg/kg)	<0.010	<0.010	<0.010		
	Phenanthrene (mg/kg)	0.010	<0.010	<0.010		
	Pyrene (mg/kg)	<0.010	<0.010	<0.010		
	Surrogate: d10-Acenaphthene (%)	71.9	75.6	72.0		
	Surrogate: d12-Chrysene (%)	95.3	95.0	90.9		
	Surrogate: d10-Phenanthrene (%)	79.0	77.5	72.1		
	Total PAHs (mg/kg)	<0.035	<0.035	<0.035		
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1221 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1232 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1242 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1248 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1254 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1260 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1262 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1268 (mg/kg)	<0.020	<0.020	<0.020		
	Total PCB (BC CSR) (mg/kg)	<0.020	<0.020	<0.020		
	Total Polychlorinated Biphenyls (mg/kg)	<0.020	<0.020	<0.020		
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)				0.365458	0.2148702
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)				0.265333	0.1110811
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)				0.164696	0.00555
	TEF Reference				World Health Organization 1998	World Health Organization 1998
	TEF Species				Fish	Fish
	2,3,7,8-TCDD (pg/g)				<0.094 [U]	<0.070 [U]
	1,2,3,7,8-PeCDD (pg/g)				0.132 M,J	<0.061 [U]
	1,2,3,4,7,8-HxCDD (pg/g)				<0.12 [U]	<0.074 [U]
	1,2,3,6,7,8-HxCDD (pg/g)				<0.11 M,J,R	<0.067 [U]
	1,2,3,7,8,9-HxCDD (pg/g)				<0.11 [U]	<0.070 [U]
	1,2,3,4,6,7,8-HpCDD (pg/g)				0.48 M,J,R	0.110 M,J,R
	OCDD (pg/g)				3.66 M,J	0.320 M,J,R
	Total-TCDD (pg/g)				<0.094 [U]	0.286

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

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Grouping	Analyte	L1730019-35 SEDIMENT 30-JAN-16 12:32 PCS13 (0.4-0.7)	L1730019-36 SEDIMENT 30-JAN-16 15:57 PCL04 (0-0.5)	L1730019-37 SEDIMENT 30-JAN-16 16:02 PCL04 (0.5-1.0)	L1730019-38 SEDIMENT 30-JAN-16 16:07 PCL04 (1.0-1.5)	L1730019-39 SEDIMENT 30-JAN-16 14:42 SS05
SOIL						
Polycyclic	Fluoranthene (mg/kg)		0.024	<0.010	<0.010	0.021
	Fluorene (mg/kg)		<0.010	<0.010	<0.010	<0.010
	Indeno(1,2,3-c,d)pyrene (mg/kg)		<0.010	<0.010	<0.010	<0.010
	Naphthalene (mg/kg)		<0.010	<0.010	<0.010	<0.010
	Phenanthrene (mg/kg)		0.018	<0.010	<0.010	0.020
	Pyrene (mg/kg)		0.021	<0.010	<0.010	0.027
	Surrogate: d10-Acenaphthene (%)		81.5	67.4	75.4	78.2
	Surrogate: d12-Chrysene (%)		89.8	82.9	90.7	86.1
	Surrogate: d10-Phenanthrene (%)		83.9	77.2	83.7	83.3
	Total PAHs (mg/kg)		0.097	<0.035	<0.035	0.089
Polychlorinated Biphenyls	PCB-1016 (mg/kg)		<0.020	<0.020	<0.020	<0.020
	PCB-1221 (mg/kg)		<0.020	<0.020	<0.020	<0.020
	PCB-1232 (mg/kg)		<0.020	<0.020	<0.020	<0.020
	PCB-1242 (mg/kg)		<0.020	<0.020	<0.020	<0.020
	PCB-1248 (mg/kg)		<0.020	<0.020	<0.020	<0.020
	PCB-1254 (mg/kg)		<0.020	<0.020	<0.020	<0.020
	PCB-1260 (mg/kg)		<0.020	<0.020	<0.020	<0.020
	PCB-1262 (mg/kg)		<0.020	<0.020	<0.020	<0.020
	PCB-1268 (mg/kg)		<0.020	<0.020	<0.020	<0.020
	Total PCB (BC CSR) (mg/kg)		<0.020	<0.020	<0.020	<0.020
	Total Polychlorinated Biphenyls (mg/kg)		<0.020	<0.020	<0.020	<0.020
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)	0.523826				
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)	0.299076				
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)	0.074287				
	TEF Reference	World Health Organization 1998				
	TEF Species	Fish				
	2,3,7,8-TCDD (pg/g)	<0.14 [U]				
	1,2,3,7,8-PeCDD (pg/g)	<0.12 [U]				
	1,2,3,4,7,8-HxCDD (pg/g)	<0.16 [U]				
	1,2,3,6,7,8-HxCDD (pg/g)	<0.15 [U]				
	1,2,3,7,8,9-HxCDD (pg/g)	<0.15 [U]				
	1,2,3,4,6,7,8-HpCDD (pg/g)	0.83 [J]				
	OCDD (pg/g)	5.48 [J]				
	Total-TCDD (pg/g)	<0.14 [U]				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-40	L1730019-41	L1730019-42	L1730019-43	L1730019-44
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	30-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16
	Sampled Time	14:50	12:12	12:18	12:25	12:41
	Client ID	SS06	PCL02 (0-0.5)	PCL02 (0.5-1.0)	PCL02 (1.0-1.3)	PCS02 (0-0.2)
Grouping	**Analyte**					
SOIL						
Polycyclic	Fluoranthene (mg/kg)	0.025	0.017	<0.010	<0.010	
	Fluorene (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Naphthalene (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Phenanthrene (mg/kg)	0.028	0.016	<0.010	<0.010	
	Pyrene (mg/kg)	0.022	0.015	<0.010	<0.010	
	Surrogate: d10-Acenaphthene (%)	69.8	79.7	70.9	64.7	
	Surrogate: d12-Chrysene (%)	84.2	83.6	81.2	80.0	
	Surrogate: d10-Phenanthrene (%)	80.0	79.3	72.3	68.8	
	Total PAHs (mg/kg)	0.116	0.083	<0.035	<0.035	
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1221 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1232 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1242 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1248 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1254 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1260 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1262 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	PCB-1268 (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	Total PCB (BC CSR) (mg/kg)	<0.020	<0.020	<0.020	<0.020	
	Total Polychlorinated Biphenyls (mg/kg)	<0.020	<0.020	<0.020	<0.020	
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)	0.47654				0.4182108
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)	0.31149				0.3209008
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)	0.14633				0.1145908
	TEF Reference	World Health Organization 1998				World Health Organization 1998
	TEF Species	Fish				Fish
	2,3,7,8-TCDD (pg/g)	<0.11 [U]				<0.073 [U]
	1,2,3,7,8-PeCDD (pg/g)	<0.094 [U]				0.096 J,R
	1,2,3,4,7,8-HxCDD (pg/g)	<0.17 [U]				<0.14 [U]
	1,2,3,6,7,8-HxCDD (pg/g)	0.88 [J]				0.82 [J]
	1,2,3,7,8,9-HxCDD (pg/g)	0.38 M,J				0.33 J,R
	1,2,3,4,6,7,8-HpCDD (pg/g)	2.00 [J]				1.99 [J]
	OCDD (pg/g)	12.7				8.60
	Total-TCDD (pg/g)	0.23				<0.073 [U]

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-45	L1730019-46	L1730019-47	L1730019-48	L1730019-49
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	31-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16
	Sampled Time	12:48	12:53	12:58	17:59	18:08
	Client ID	PCS02 (0.2-0.4)	PCS02 (0.4-0.6)	PCS02 (0.6-0.68)	PCL05 (0-0.5)	PCL05 (0.5-1.0)
Grouping	**Analyte**					
SOIL						
Polycyclic	Fluoranthene (mg/kg)				0.014	<0.010
	Fluorene (mg/kg)				<0.010	<0.010
	Indeno(1,2,3-c,d)pyrene (mg/kg)				<0.010	<0.010
	Naphthalene (mg/kg)				<0.010	<0.010
	Phenanthrene (mg/kg)				0.014	<0.010
	Pyrene (mg/kg)				0.013	<0.010
	Surrogate: d10-Acenaphthene (%)				96.9	91.7
	Surrogate: d12-Chrysene (%)				91.0	87.4
	Surrogate: d10-Phenanthrene (%)				96.0	89.7
	Total PAHs (mg/kg)				0.053	<0.035
Polychlorinated Biphenyls	PCB-1016 (mg/kg)				<0.020	<0.020
	PCB-1221 (mg/kg)				<0.020	<0.020
	PCB-1232 (mg/kg)				<0.020	<0.020
	PCB-1242 (mg/kg)				<0.020	<0.020
	PCB-1248 (mg/kg)				<0.020	<0.020
	PCB-1254 (mg/kg)				<0.020	<0.020
	PCB-1260 (mg/kg)				<0.020	<0.020
	PCB-1262 (mg/kg)				<0.020	<0.020
	PCB-1268 (mg/kg)				<0.020	<0.020
	Total PCB (BC CSR) (mg/kg)				<0.020	<0.020
	Total Polychlorinated Biphenyls (mg/kg)				<0.020	<0.020
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)	0.391274	0.310581	0.1494464		
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)	0.235149	0.175576	0.0764737		
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)	0.076373	0.039181	0		
	TEF Reference	World Health Organization 1998	World Health Organization 1998	World Health Organization 1998		
	TEF Species	Fish	Fish	Fish		
	2,3,7,8-TCDD (pg/g)	<0.099 [U]	<0.080 [U]	<0.052 [U]		
	1,2,3,7,8-PeCDD (pg/g)	<0.075 [U]	<0.068 [U]	<0.042 [U]		
	1,2,3,4,7,8-HxCDD (pg/g)	<0.17 [U]	<0.16 [U]	<0.051 [U]		
	1,2,3,6,7,8-HxCDD (pg/g)	0.54 [M,J]	<0.15 [M,U]	<0.044 [U]		
	1,2,3,7,8,9-HxCDD (pg/g)	<0.16 [U]	<0.15 [U]	<0.046 [U]		
	1,2,3,4,6,7,8-HpCDD (pg/g)	0.94 [J]	0.37 [M,J,R]	0.077 [M,J,R]		
	OCDD (pg/g)	5.67 [J]	4.81 [J]	0.240 [M,J,R]		
	Total-TCDD (pg/g)	<0.099 [U]	<0.080 [U]	<0.052 [U]		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-50	L1730019-51	L1730019-52	L1730019-53	L1730019-54
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	31-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16
	Sampled Time	17:18	17:25	17:31	17:42	17:47
	Client ID	PCL06 (0-0.5)	PCL06 (0.5-1.0)	PCL06 (1.0-1.5)	PCL06 (1.5-2.0)	PCL06 (2.0-2.4)
Grouping	**Analyte**					
SOIL						
Polycyclic	Fluoranthene (mg/kg)	0.054	0.011	<0.010		
	Fluorene (mg/kg)	<0.010	<0.010	<0.010		
	Indeno(1,2,3-c,d)pyrene (mg/kg)	0.012	<0.010	<0.010		
	Naphthalene (mg/kg)	0.013	<0.010	<0.010		
	Phenanthrene (mg/kg)	0.041	0.016	0.013		
	Pyrene (mg/kg)	0.045	0.011	<0.010		
	Surrogate: d10-Acenaphthene (%)	91.0	101.6	92.7		
	Surrogate: d12-Chrysene (%)	82.4	96.1	85.7		
	Surrogate: d10-Phenanthrene (%)	91.1	101.1	91.8		
	Total PAHs (mg/kg)	0.286	0.037	<0.035		
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1221 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1232 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1242 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1248 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1254 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1260 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1262 (mg/kg)	<0.020	<0.020	<0.020		
	PCB-1268 (mg/kg)	<0.020	<0.020	<0.020		
	Total PCB (BC CSR) (mg/kg)	<0.020	<0.020	<0.020		
	Total Polychlorinated Biphenyls (mg/kg)	<0.020	<0.020	<0.020		
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)					
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)					
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)					
	TEF Reference					
	TEF Species					
	2,3,7,8-TCDD (pg/g)					
	1,2,3,7,8-PeCDD (pg/g)					
	1,2,3,4,7,8-HxCDD (pg/g)					
	1,2,3,6,7,8-HxCDD (pg/g)					
	1,2,3,7,8,9-HxCDD (pg/g)					
	1,2,3,4,6,7,8-HpCDD (pg/g)					
	OCDD (pg/g)					
	Total-TCDD (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1730019-55 SEDIMENT 31-JAN-16 15:58 PCS06 (0-0.2)	L1730019-56 SEDIMENT 31-JAN-16 16:02 PCS06 (0.2-0.4)	L1730019-57 SEDIMENT 31-JAN-16 16:08 PCS06 (0.4-0.6)	L1730019-58 SEDIMENT 31-JAN-16 16:13 PCS06 (0.6-0.8)	L1730019-59 SEDIMENT 31-JAN-16 16:21 PCS06 (0.8-1.0)
SOIL						
Polycyclic	Fluoranthene (mg/kg)					
	Fluorene (mg/kg)					
	Indeno(1,2,3-c,d)pyrene (mg/kg)					
	Naphthalene (mg/kg)					
	Phenanthrene (mg/kg)					
	Pyrene (mg/kg)					
	Surrogate: d10-Acenaphthene (%)					
	Surrogate: d12-Chrysene (%)					
	Surrogate: d10-Phenanthrene (%)					
	Total PAHs (mg/kg)					
Polychlorinated Biphenyls	PCB-1016 (mg/kg)					
	PCB-1221 (mg/kg)					
	PCB-1232 (mg/kg)					
	PCB-1242 (mg/kg)					
	PCB-1248 (mg/kg)					
	PCB-1254 (mg/kg)					
	PCB-1260 (mg/kg)					
	PCB-1262 (mg/kg)					
	PCB-1268 (mg/kg)					
	Total PCB (BC CSR) (mg/kg)					
	Total Polychlorinated Biphenyls (mg/kg)					
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)	1.27507	0.4012657	0.25433	0.2615674	0.565432
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)	1.22969	0.2527457	0.136265	0.1307977	0.282716
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)	0.97979	0.1000257	0.0116	0	0
	TEF Reference	World Health Organization 1998	World Health Organization 1998	World Health Organization 1998	World Health Organization 1998	World Health Organization 1998
	TEF Species	Fish	Fish	Fish	Fish	Fish
	2,3,7,8-TCDD (pg/g)	0.200 J,R	<0.075 [U]	<0.073 [U]	<0.10 [U]	<0.22 [U]
	1,2,3,7,8-PeCDD (pg/g)	0.405 [J]	<0.078 [U]	<0.063 [U]	<0.070 [U]	<0.17 [U]
	1,2,3,4,7,8-HxCDD (pg/g)	<0.14 [U]	<0.18 [U]	<0.10 [U]	<0.086 [U]	<0.16 [U]
	1,2,3,6,7,8-HxCDD (pg/g)	2.70 [J]	0.42 J,R	<0.089 M,U	<0.072 [U]	<0.14 [U]
	1,2,3,7,8,9-HxCDD (pg/g)	1.24 [J]	<0.17 [U]	<0.093 [U]	<0.077 [U]	<0.14 [U]
	1,2,3,4,6,7,8-HpCDD (pg/g)	6.47	2.36 M,J	1.40 M,J,R	<0.080 M,U	<0.22 [U]
	OCDD (pg/g)	38.2	14.4	10.3	0.28 M,J,R	<0.25 M,J,R
	Total-TCDD (pg/g)	0.591	<0.075 [U]	<0.073 [U]	<0.10 [U]	<0.22 [U]

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-68				
	Description	SEDIMENT				
	Sampled Date	31-JAN-16				
	Sampled Time	18:17				
	Client ID	PCL05 (1.0-1.2)				
Grouping	**Analyte**					
SOIL						
Polycyclic	Fluoranthene (mg/kg)	<0.010				
	Fluorene (mg/kg)	<0.010				
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.010				
	Naphthalene (mg/kg)	<0.010				
	Phenanthrene (mg/kg)	<0.010				
	Pyrene (mg/kg)	<0.010				
	Surrogate: d10-Acenaphthene (%)	93.5				
	Surrogate: d12-Chrysene (%)	79.0				
	Surrogate: d10-Phenanthrene (%)	87.6				
	Total PAHs (mg/kg)	<0.035				
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020				
	PCB-1221 (mg/kg)	<0.020				
	PCB-1232 (mg/kg)	<0.020				
	PCB-1242 (mg/kg)	<0.020				
	PCB-1248 (mg/kg)	<0.020				
	PCB-1254 (mg/kg)	<0.020				
	PCB-1260 (mg/kg)	<0.020				
	PCB-1262 (mg/kg)	<0.020				
	PCB-1268 (mg/kg)	<0.020				
	Total PCB (BC CSR) (mg/kg)	<0.020				
	Total Polychlorinated Biphenyls (mg/kg)	<0.020				
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)					
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)					
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)					
	TEF Reference					
	TEF Species					
	2,3,7,8-TCDD (pg/g)					
	1,2,3,7,8-PeCDD (pg/g)					
	1,2,3,4,7,8-HxCDD (pg/g)					
	1,2,3,6,7,8-HxCDD (pg/g)					
	1,2,3,7,8,9-HxCDD (pg/g)					
	1,2,3,4,6,7,8-HpCDD (pg/g)					
	OCDD (pg/g)					
	Total-TCDD (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-1	L1730019-2	L1730019-3	L1730019-4	L1730019-5
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16
	Sampled Time	11:23	11:37	11:48	11:57	12:04
	Client ID	PCL30 (0-0.5)	PCL30 (0.5-1.0)	PCL30 (1.0-1.5)	PCL30 (1.5-2.0)	PCL30 (2.0-2.16)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total TCDD # Homologues					
	Total-PeCDD (pg/g)					
	Total PeCDD # Homologues					
	Total-HxCDD (pg/g)					
	Total HxCDD # Homologues					
	Total-HpCDD (pg/g)					
	Total HpCDD # Homologues					
	2,3,7,8-TCDF (pg/g)					
	1,2,3,7,8-PeCDF (pg/g)					
	2,3,4,7,8-PeCDF (pg/g)					
	1,2,3,4,7,8-HxCDF (pg/g)					
	1,2,3,6,7,8-HxCDF (pg/g)					
	1,2,3,7,8,9-HxCDF (pg/g)					
	2,3,4,6,7,8-HxCDF (pg/g)					
	1,2,3,4,6,7,8-HpCDF (pg/g)					
	1,2,3,4,7,8,9-HpCDF (pg/g)					
	OCDF (pg/g)					
	Total-TCDF (pg/g)					
	Total TCDF # Homologues					
	Total-PeCDF (pg/g)					
	Total PeCDF # Homologues					
	Total-HxCDF (pg/g)					
	Total HxCDF # Homologues					
	Total-HpCDF (pg/g)					
	Total HpCDF # Homologues					
	Surrogate: 13C12-2,3,7,8-TCDD (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)					
	Surrogate: 13C12-OCDD (%)					
	Surrogate: 13C12-2,3,7,8-TCDF (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)					
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)					
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-6	L1730019-7	L1730019-8	L1730019-9	L1730019-10
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16
	Sampled Time	12:14	12:30	12:40	15:31	15:43
	Client ID	PCL31 (0-0.5)	PCL31 (0.5-1.0)	PCL31 (1.0-1.25)	PCL14 (0-0.5)	PCL14 (0.5-1.0)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total TCDD # Homologues					
	Total-PeCDD (pg/g)					
	Total PeCDD # Homologues					
	Total-HxCDD (pg/g)					
	Total HxCDD # Homologues					
	Total-HpCDD (pg/g)					
	Total HpCDD # Homologues					
	2,3,7,8-TCDF (pg/g)					
	1,2,3,7,8-PeCDF (pg/g)					
	2,3,4,7,8-PeCDF (pg/g)					
	1,2,3,4,7,8-HxCDF (pg/g)					
	1,2,3,6,7,8-HxCDF (pg/g)					
	1,2,3,7,8,9-HxCDF (pg/g)					
	2,3,4,6,7,8-HxCDF (pg/g)					
	1,2,3,4,6,7,8-HpCDF (pg/g)					
	1,2,3,4,7,8,9-HpCDF (pg/g)					
	OCDF (pg/g)					
	Total-TCDF (pg/g)					
	Total TCDF # Homologues					
	Total-PeCDF (pg/g)					
	Total PeCDF # Homologues					
	Total-HxCDF (pg/g)					
	Total HxCDF # Homologues					
	Total-HpCDF (pg/g)					
	Total HpCDF # Homologues					
	Surrogate: 13C12-2,3,7,8-TCDD (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)					
	Surrogate: 13C12-OCDD (%)					
	Surrogate: 13C12-2,3,7,8-TCDF (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)					
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)					
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)					

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1730019-11	L1730019-12	L1730019-13	L1730019-14	L1730019-15
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16
Sampled Time	15:51	16:00	16:19	16:26	16:28
Client ID	PCL14 (1.0-1.5)	PCL14 (1.5-2.0)	PCS14 (0-0.2)	PCS14 (0.2-0.4)	PCS14 (0.4-0.6)
Grouping / **Analyte**					
SOIL					
Dioxins and Furans					
Total TCDD # Homologues			0	0	2
Total-PeCDD (pg/g)			0.701	0.138	0.393
Total PeCDD # Homologues			3	1	1
Total-HxCDD (pg/g)			13.3	3.85	0.427
Total HxCDD # Homologues			3	3	1
Total-HpCDD (pg/g)			8.39	1.16	0.595
Total HpCDD # Homologues			2	1	2
2,3,7,8-TCDF (pg/g)			4.75	1.01 [M]	<0.059 M,U
1,2,3,7,8-PeCDF (pg/g)			0.068 J,R	<0.067 [U]	0.084 [J]
2,3,4,7,8-PeCDF (pg/g)			0.140 [J]	<0.059 [U]	0.096 [J]
1,2,3,4,7,8-HxCDF (pg/g)			<0.075 M,U	<0.065 [U]	0.141 M,J
1,2,3,6,7,8-HxCDF (pg/g)			<0.068 [U]	<0.062 [U]	<0.088 [U]
1,2,3,7,8,9-HxCDF (pg/g)			<0.11 [U]	<0.096 [U]	<0.13 [U]
2,3,4,6,7,8-HxCDF (pg/g)			<0.068 [U]	<0.062 [U]	<0.087 M,U
1,2,3,4,6,7,8-HpCDF (pg/g)			0.835 [J]	0.352 [J]	0.419 M,J
1,2,3,4,7,8,9-HpCDF (pg/g)			<0.11 [U]	<0.050 [U]	<0.066 M,U
OCDF (pg/g)			1.42 M,J	0.767 [J]	0.370 M,J
Total-TCDF (pg/g)			8.29	2.21	0.139
Total TCDF # Homologues			5	5	1
Total-PeCDF (pg/g)			0.234	<0.067 [U]	0.318
Total PeCDF # Homologues			2	0	4
Total-HxCDF (pg/g)			<0.11 [U]	0.155	0.14
Total HxCDF # Homologues			0	1	1
Total-HpCDF (pg/g)			2.34	0.936	0.419
Total HpCDF # Homologues			2	2	1
Surrogate: 13C12-2,3,7,8-TCDD (%)			50.0	63.0	60.0
Surrogate: 13C12-1,2,3,7,8-PeCDD (%)			45.0	54.0	48.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)			64.0	71.0	68.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)			77.0	82.0	84.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)			63.0	65.0	66.0
Surrogate: 13C12-OCDD (%)			53.0	56.0	55.0
Surrogate: 13C12-2,3,7,8-TCDF (%)			46.0	58.0	56.0
Surrogate: 13C12-1,2,3,7,8-PeCDF (%)			46.0	52.0	49.0
Surrogate: 13C12-2,3,4,7,8-PeCDF (%)			46.0	54.0	49.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)			62.0	67.0	68.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)			72.0	78.0	79.0
Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)			68.0	75.0	76.0

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1730019-16	L1730019-17	L1730019-22	L1730019-23	L1730019-24
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16
Sampled Time	16:35	16:38			
Client ID	PCS14 (0.6-0.8)	PCS14 (0.8-1.0)	SPLIT 6 (0-0.5)	SPLIT 6 (0.5-1.0)	SPLIT 6 (1.0-1.5)
Grouping **Analyte**					
SOIL					
Dioxins and Furans Total TCDD # Homologues	0	3			
Total-PeCDD (pg/g)	0.146	0.65			
Total PeCDD # Homologues	1	1			
Total-HxCDD (pg/g)	0.160	0.86			
Total HxCDD # Homologues	2	1			
Total-HpCDD (pg/g)	0.184	1.40			
Total HpCDD # Homologues	1	2			
2,3,7,8-TCDF (pg/g)	0.136 [J]	<0.18 M,U			
1,2,3,7,8-PeCDF (pg/g)	<0.041 [U]	0.13 [J]			
2,3,4,7,8-PeCDF (pg/g)	<0.035 [U]	0.18 M,J			
1,2,3,4,7,8-HxCDF (pg/g)	<0.036 [U]	0.19 M,J,R			
1,2,3,6,7,8-HxCDF (pg/g)	<0.033 [U]	<0.11 M,U			
1,2,3,7,8,9-HxCDF (pg/g)	<0.054 [U]	<0.18 [U]			
2,3,4,6,7,8-HxCDF (pg/g)	<0.033 M,U	<0.11 M,U			
1,2,3,4,6,7,8-HpCDF (pg/g)	0.087 J,R	0.983 [J]			
1,2,3,4,7,8,9-HpCDF (pg/g)	<0.048 [U]	<0.12 [U]			
OCDF (pg/g)	0.110 M,J,R	0.40 M,J,R			
Total-TCDF (pg/g)	0.136	0.40			
Total TCDF # Homologues	1	1			
Total-PeCDF (pg/g)	<0.041 [U]	0.60			
Total PeCDF # Homologues	0	4			
Total-HxCDF (pg/g)	<0.054 [U]	0.38			
Total HxCDF # Homologues	0	1			
Total-HpCDF (pg/g)	0.086	0.98			
Total HpCDF # Homologues	1	1			
Surrogate: 13C12-2,3,7,8-TCDD (%)	58.0	43.0			
Surrogate: 13C12-1,2,3,7,8-PeCDD (%)	48.0	37.0			
Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)	67.0	51.0			
Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)	80.0	61.0			
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)	65.0	52.0			
Surrogate: 13C12-OCDD (%)	57.0	46.0			
Surrogate: 13C12-2,3,7,8-TCDF (%)	56.0	42.0			
Surrogate: 13C12-1,2,3,7,8-PeCDF (%)	51.0	38.0			
Surrogate: 13C12-2,3,4,7,8-PeCDF (%)	49.0	36.0			
Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)	66.0	51.0			
Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)	75.0	61.0			
Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)	73.0	58.0			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-25	L1730019-26	L1730019-27	L1730019-28	L1730019-29
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	29-JAN-16	29-JAN-16	30-JAN-16	30-JAN-16	30-JAN-16
	Sampled Time			11:30	11:39	11:46
	Client ID	SPLIT 6 (1.5-2.0)	SPLIT 6 (2.0-2.16)	PCL12 (0-0.5)	PCL12 (0.5-1.0)	PCL12 (1.0-1.3)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total TCDD # Homologues					
	Total-PeCDD (pg/g)					
	Total PeCDD # Homologues					
	Total-HxCDD (pg/g)					
	Total HxCDD # Homologues					
	Total-HpCDD (pg/g)					
	Total HpCDD # Homologues					
	2,3,7,8-TCDF (pg/g)					
	1,2,3,7,8-PeCDF (pg/g)					
	2,3,4,7,8-PeCDF (pg/g)					
	1,2,3,4,7,8-HxCDF (pg/g)					
	1,2,3,6,7,8-HxCDF (pg/g)					
	1,2,3,7,8,9-HxCDF (pg/g)					
	2,3,4,6,7,8-HxCDF (pg/g)					
	1,2,3,4,6,7,8-HpCDF (pg/g)					
	1,2,3,4,7,8,9-HpCDF (pg/g)					
	OCDF (pg/g)					
	Total-TCDF (pg/g)					
	Total TCDF # Homologues					
	Total-PeCDF (pg/g)					
	Total PeCDF # Homologues					
	Total-HxCDF (pg/g)					
	Total HxCDF # Homologues					
	Total-HpCDF (pg/g)					
	Total HpCDF # Homologues					
	Surrogate: 13C12-2,3,7,8-TCDD (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)					
	Surrogate: 13C12-OCDD (%)					
	Surrogate: 13C12-2,3,7,8-TCDF (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)					
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)					
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)					

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1730019-30	L1730019-31	L1730019-32	L1730019-33	L1730019-34
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	30-JAN-16	30-JAN-16	30-JAN-16	30-JAN-16	30-JAN-16
Sampled Time	12:00	12:03	12:13	12:22	12:27
Client ID	PCL13 (0-0.5)	PCL13 (0.5-1.0)	PCL13 (1.0-1.3)	PCS13 (0-0.2)	PCS13 (0.2-0.4)
Grouping / **Analyte**					
SOIL					
Dioxins and Furans					
Total TCDD # Homologues				0	1
Total-PeCDD (pg/g)				0.132	<0.061 [U]
Total PeCDD # Homologues				1	0
Total-HxCDD (pg/g)				<0.12 [U]	<0.074 [U]
Total HxCDD # Homologues				0	0
Total-HpCDD (pg/g)				0.85	<0.076 [U]
Total HpCDD # Homologues				1	0
2,3,7,8-TCDF (pg/g)				0.448 [J]	0.111 [J]
1,2,3,7,8-PeCDF (pg/g)				<0.042 [U]	<0.041 [U]
2,3,4,7,8-PeCDF (pg/g)				<0.039 [U]	<0.038 [U]
1,2,3,4,7,8-HxCDF (pg/g)				<0.064 [U]	<0.038 [U]
1,2,3,6,7,8-HxCDF (pg/g)				<0.058 M,U	<0.035 [U]
1,2,3,7,8,9-HxCDF (pg/g)				<0.093 [U]	<0.055 [U]
2,3,4,6,7,8-HxCDF (pg/g)				0.071 [J]	<0.036 M,U
1,2,3,4,6,7,8-HpCDF (pg/g)				0.285 M,J	0.160 M,J,R
1,2,3,4,7,8,9-HpCDF (pg/g)				<0.095 [U]	<0.075 [U]
OCDF (pg/g)				0.32 M,J,R	<0.082 [U]
Total-TCDF (pg/g)				0.663	0.111
Total TCDF # Homologues				2	1
Total-PeCDF (pg/g)				0.065	<0.041 [U]
Total PeCDF # Homologues				1	0
Total-HxCDF (pg/g)				<0.093 [U]	<0.055 [U]
Total HxCDF # Homologues				0	0
Total-HpCDF (pg/g)				0.285	<0.075 [U]
Total HpCDF # Homologues				1	0
Surrogate: 13C12-2,3,7,8-TCDD (%)				67.0	52.0
Surrogate: 13C12-1,2,3,7,8-PeCDD (%)				57.0	44.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)				70.0	55.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)				88.0	70.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)				74.0	57.0
Surrogate: 13C12-OCDD (%)				66.0	53.0
Surrogate: 13C12-2,3,7,8-TCDF (%)				64.0	50.0
Surrogate: 13C12-1,2,3,7,8-PeCDF (%)				59.0	45.0
Surrogate: 13C12-2,3,4,7,8-PeCDF (%)				58.0	43.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)				71.0	56.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)				90.0	67.0
Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)				81.0	63.0

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1730019-35	L1730019-36	L1730019-37	L1730019-38	L1730019-39
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	30-JAN-16	30-JAN-16	30-JAN-16	30-JAN-16	30-JAN-16
Sampled Time	12:32	15:57	16:02	16:07	14:42
Client ID	PCS13 (0.4-0.7)	PCL04 (0-0.5)	PCL04 (0.5-1.0)	PCL04 (1.0-1.5)	SS05
Grouping **Analyte**					
SOIL					
Dioxins and Furans Total TCDD # Homologues	0				
Total-PeCDD (pg/g)	<0.12 [U]				
Total PeCDD # Homologues	0				
Total-HxCDD (pg/g)	<0.16 [U]				
Total HxCDD # Homologues	0				
Total-HpCDD (pg/g)	1.88				
Total HpCDD # Homologues	2				
2,3,7,8-TCDF (pg/g)	1.38				
1,2,3,7,8-PeCDF (pg/g)	<0.082 [U]				
2,3,4,7,8-PeCDF (pg/g)	<0.072 M,U				
1,2,3,4,7,8-HxCDF (pg/g)	<0.15 [U]				
1,2,3,6,7,8-HxCDF (pg/g)	<0.13 [U]				
1,2,3,7,8,9-HxCDF (pg/g)	<0.22 [U]				
2,3,4,6,7,8-HxCDF (pg/g)	<0.14 [U]				
1,2,3,4,6,7,8-HpCDF (pg/g)	0.39 M,J				
1,2,3,4,7,8,9-HpCDF (pg/g)	<0.24 [U]				
OCDF (pg/g)	0.39 M,J,R				
Total-TCDF (pg/g)	1.78				
Total TCDF # Homologues	2				
Total-PeCDF (pg/g)	0.102				
Total PeCDF # Homologues	1				
Total-HxCDF (pg/g)	0.30				
Total HxCDF # Homologues	2				
Total-HpCDF (pg/g)	0.79				
Total HpCDF # Homologues	2				
Surrogate: 13C12-2,3,7,8-TCDD (%)	32.0				
Surrogate: 13C12-1,2,3,7,8-PeCDD (%)	26.0				
Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)	40.0				
Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)	48.0				
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)	41.0				
Surrogate: 13C12-OCDD (%)	38.0				
Surrogate: 13C12-2,3,7,8-TCDF (%)	32.0				
Surrogate: 13C12-1,2,3,7,8-PeCDF (%)	27.0				
Surrogate: 13C12-2,3,4,7,8-PeCDF (%)	26.0				
Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)	41.0				
Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)	49.0				
Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)	46.0				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1730019-40	L1730019-41	L1730019-42	L1730019-43	L1730019-44
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	30-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16
Sampled Time	14:50	12:12	12:18	12:25	12:41
Client ID	SS06	PCL02 (0-0.5)	PCL02 (0.5-1.0)	PCL02 (1.0-1.3)	PCS02 (0-0.2)
Grouping **Analyte**					
SOIL					
Dioxins and Furans Total TCDD # Homologues	1				0
Total-PeCDD (pg/g)	0.161				0.221
Total PeCDD # Homologues	1				2
Total-HxCDD (pg/g)	5.46				5.58
Total HxCDD # Homologues	4				3
Total-HpCDD (pg/g)	4.99				4.62
Total HpCDD # Homologues	2				2
2,3,7,8-TCDF (pg/g)	1.88				2.07
1,2,3,7,8-PeCDF (pg/g)	<0.064 [U]				<0.068 M,U
2,3,4,7,8-PeCDF (pg/g)	0.063 M,J				<0.062 M,U
1,2,3,4,7,8-HxCDF (pg/g)	<0.085 M,U				<0.049 [U]
1,2,3,6,7,8-HxCDF (pg/g)	<0.079 [U]				<0.047 [U]
1,2,3,7,8,9-HxCDF (pg/g)	<0.12 [U]				<0.070 [U]
2,3,4,6,7,8-HxCDF (pg/g)	<0.079 [U]				0.061 J,R
1,2,3,4,6,7,8-HpCDF (pg/g)	0.52 [J]				0.360 J,R
1,2,3,4,7,8,9-HpCDF (pg/g)	<0.16 [U]				<0.062 [U]
OCDF (pg/g)	1.10 M,J,R				0.908 [J]
Total-TCDF (pg/g)	3.32				3.67
Total TCDF # Homologues	4				5
Total-PeCDF (pg/g)	<0.064 [U]				0.522
Total PeCDF # Homologues	0				3
Total-HxCDF (pg/g)	<0.12 [U]				0.299
Total HxCDF # Homologues	0				1
Total-HpCDF (pg/g)	1.39				0.704
Total HpCDF # Homologues	2				1
Surrogate: 13C12-2,3,7,8-TCDD (%)	42.0				67.0
Surrogate: 13C12-1,2,3,7,8-PeCDD (%)	35.0				57.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)	48.0				68.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)	59.0				85.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)	49.0				73.0
Surrogate: 13C12-OCDD (%)	46.0				65.0
Surrogate: 13C12-2,3,7,8-TCDF (%)	41.0				65.0
Surrogate: 13C12-1,2,3,7,8-PeCDF (%)	38.0				61.0
Surrogate: 13C12-2,3,4,7,8-PeCDF (%)	38.0				60.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)	48.0				71.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)	57.0				82.0
Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)	54.0				80.0

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-45	L1730019-46	L1730019-47	L1730019-48	L1730019-49
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	31-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16
	Sampled Time	12:48	12:53	12:58	17:59	18:08
	Client ID	PCS02 (0.2-0.4)	PCS02 (0.4-0.6)	PCS02 (0.6-0.68)	PCL05 (0-0.5)	PCL05 (0.5-1.0)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total TCDD # Homologues	0	0	0		
	Total-PeCDD (pg/g)	<0.075 [U]	<0.068 [U]	<0.042 [U]		
	Total PeCDD # Homologues	0	0	0		
	Total-HxCDD (pg/g)	4.46	1.34	<0.051 [U]		
	Total HxCDD # Homologues	3	2	0		
	Total-HpCDD (pg/g)	0.94	0.64	<0.046 [U]		
	Total HpCDD # Homologues	1	1	0		
	2,3,7,8-TCDF (pg/g)	1.39	0.774	0.068 J,R		
	1,2,3,7,8-PeCDF (pg/g)	<0.054 [U]	<0.037 [U]	<0.026 [U]		
	2,3,4,7,8-PeCDF (pg/g)	<0.049 [U]	<0.034 [U]	<0.023 [U]		
	1,2,3,4,7,8-HxCDF (pg/g)	<0.054 [U]	<0.045 [U]	<0.028 [U]		
	1,2,3,6,7,8-HxCDF (pg/g)	<0.050 [U]	<0.041 [U]	<0.026 [U]		
	1,2,3,7,8,9-HxCDF (pg/g)	<0.078 [U]	<0.068 [U]	<0.041 M,U		
	2,3,4,6,7,8-HxCDF (pg/g)	<0.053 [U]	<0.041 [U]	<0.026 [U]		
	1,2,3,4,6,7,8-HpCDF (pg/g)	0.260 J,R	0.100 M,J,R	<0.026 [U]		
	1,2,3,4,7,8,9-HpCDF (pg/g)	<0.095 [U]	<0.066 [U]	<0.038 [U]		
	OCDF (pg/g)	0.51 M,J,R	0.20 M,J,R	<0.054 M,U		
	Total-TCDF (pg/g)	2.38	0.774	0.364		
	Total TCDF # Homologues	3	1	3		
	Total-PeCDF (pg/g)	<0.054 [U]	<0.037 [U]	<0.026 [U]		
	Total PeCDF # Homologues	0	0	0		
	Total-HxCDF (pg/g)	0.134	<0.068 [U]	<0.041 [U]		
	Total HxCDF # Homologues	1	0	0		
	Total-HpCDF (pg/g)	0.345	0.156	<0.038 [U]		
	Total HpCDF # Homologues	1	1	0		
	Surrogate: 13C12-2,3,7,8-TCDD (%)	61.0	38.0	68.0		
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)	52.0	34.0	58.0		
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)	68.0	45.0	69.0		
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)	85.0	59.0	95.0		
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)	76.0	49.0	78.0		
	Surrogate: 13C12-OCDD (%)	66.0	45.0	71.0		
	Surrogate: 13C12-2,3,7,8-TCDF (%)	61.0	37.0	68.0		
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)	55.0	36.0	61.0		
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)	53.0	33.0	59.0		
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)	70.0	46.0	72.0		
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)	84.0	57.0	90.0		
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)	79.0	53.0	83.0		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-50	L1730019-51	L1730019-52	L1730019-53	L1730019-54
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	31-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16
	Sampled Time	17:18	17:25	17:31	17:42	17:47
	Client ID	PCL06 (0-0.5)	PCL06 (0.5-1.0)	PCL06 (1.0-1.5)	PCL06 (1.5-2.0)	PCL06 (2.0-2.4)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total TCDD # Homologues					
	Total-PeCDD (pg/g)					
	Total PeCDD # Homologues					
	Total-HxCDD (pg/g)					
	Total HxCDD # Homologues					
	Total-HpCDD (pg/g)					
	Total HpCDD # Homologues					
	2,3,7,8-TCDF (pg/g)					
	1,2,3,7,8-PeCDF (pg/g)					
	2,3,4,7,8-PeCDF (pg/g)					
	1,2,3,4,7,8-HxCDF (pg/g)					
	1,2,3,6,7,8-HxCDF (pg/g)					
	1,2,3,7,8,9-HxCDF (pg/g)					
	2,3,4,6,7,8-HxCDF (pg/g)					
	1,2,3,4,6,7,8-HpCDF (pg/g)					
	1,2,3,4,7,8,9-HpCDF (pg/g)					
	OCDF (pg/g)					
	Total-TCDF (pg/g)					
	Total TCDF # Homologues					
	Total-PeCDF (pg/g)					
	Total PeCDF # Homologues					
	Total-HxCDF (pg/g)					
	Total HxCDF # Homologues					
	Total-HpCDF (pg/g)					
	Total HpCDF # Homologues					
	Surrogate: 13C12-2,3,7,8-TCDD (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)					
	Surrogate: 13C12-OCDD (%)					
	Surrogate: 13C12-2,3,7,8-TCDF (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)					
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)					
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)					

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1730019-55	L1730019-56	L1730019-57	L1730019-58	L1730019-59
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	31-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16
Sampled Time	15:58	16:02	16:08	16:13	16:21
Client ID	PCS06 (0-0.2)	PCS06 (0.2-0.4)	PCS06 (0.4-0.6)	PCS06 (0.6-0.8)	PCS06 (0.8-1.0)
Grouping / **Analyte**					
SOIL					
Dioxins and Furans					
Total TCDD # Homologues	2	0	0	0	0
Total-PeCDD (pg/g)	1.55	<0.078 [U]	<0.063 [U]	<0.070 [U]	<0.17 [U]
Total PeCDD # Homologues	4	0	0	0	0
Total-HxCDD (pg/g)	20.2	2.90	0.19	<0.086 [U]	<0.16 [U]
Total HxCDD # Homologues	6	1	3	0	0
Total-HpCDD (pg/g)	16.0	2.36	1.32	0.085	<0.22 [U]
Total HpCDD # Homologues	2	1	1	1	0
2,3,7,8-TCDF (pg/g)	7.59	1.84	0.207 [J]	<0.082 [U]	<0.13 [U]
1,2,3,7,8-PeCDF (pg/g)	0.085 J,R	<0.051 [U]	<0.034 [U]	<0.043 [U]	<0.087 [U]
2,3,4,7,8-PeCDF (pg/g)	0.232 [J]	<0.044 [U]	<0.031 [U]	<0.038 [U]	<0.074 [U]
1,2,3,4,7,8-HxCDF (pg/g)	<0.061 M,U	<0.061 [U]	<0.074 [U]	<0.046 [U]	<0.094 [U]
1,2,3,6,7,8-HxCDF (pg/g)	<0.055 M,U	<0.057 [U]	<0.064 [U]	<0.044 [U]	<0.090 [U]
1,2,3,7,8,9-HxCDF (pg/g)	<0.083 [U]	<0.092 [U]	<0.10 [U]	<0.070 [U]	<0.15 [U]
2,3,4,6,7,8-HxCDF (pg/g)	0.146 [J]	<0.060 [U]	<0.065 [U]	<0.044 [U]	<0.093 [U]
1,2,3,4,6,7,8-HpCDF (pg/g)	1.50 [J]	0.413 [J]	0.520 J,R	<0.050 M,U	<0.071 [U]
1,2,3,4,7,8,9-HpCDF (pg/g)	<0.086 [U]	<0.079 [U]	<0.081 [U]	<0.081 [U]	<0.11 [U]
OCDF (pg/g)	2.70 J,R	0.957 [J]	2.20 [J]	<0.094 [U]	<0.27 [U]
Total-TCDF (pg/g)	15.1	2.66	0.504	0.472	<0.13 [U]
Total TCDF # Homologues	12	2	2	2	0
Total-PeCDF (pg/g)	0.467	<0.051 [U]	<0.034 [U]	<0.043 [U]	<0.087 [U]
Total PeCDF # Homologues	4	0	0	0	0
Total-HxCDF (pg/g)	2.57	<0.092 [U]	0.23	<0.070 [U]	<0.15 [U]
Total HxCDF # Homologues	4	0	2	0	0
Total-HpCDF (pg/g)	4.49	1.39	<0.081 [U]	<0.081 [U]	<0.11 [U]
Total HpCDF # Homologues	2	2	0	0	0
Surrogate: 13C12-2,3,7,8-TCDD (%)	68.0	62.0	67.0	57.0	24.0 G
Surrogate: 13C12-1,2,3,7,8-PeCDD (%)	51.0	55.0	58.0	49.0	21.0 G
Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)	60.0	65.0	71.0	65.0	29.0 G
Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)	87.0	86.0	97.0	86.0	38.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)	63.0	75.0	81.0	72.0	33.0
Surrogate: 13C12-OCDD (%)	51.0	63.0	70.0	64.0	31.0
Surrogate: 13C12-2,3,7,8-TCDF (%)	68.0	63.0	66.0	57.0	25.0
Surrogate: 13C12-1,2,3,7,8-PeCDF (%)	54.0	58.0	63.0	51.0	22.0 G
Surrogate: 13C12-2,3,4,7,8-PeCDF (%)	53.0	55.0	58.0	49.0	22.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)	66.0	69.0	74.0	70.0	29.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)	88.0	84.0	97.0	87.0	39.0
Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)	80.0	78.0	85.0	78.0	35.0

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-68				
	Description	SEDIMENT				
	Sampled Date	31-JAN-16				
	Sampled Time	18:17				
	Client ID	PCL05 (1.0-1.2)				
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total TCDD # Homologues					
	Total-PeCDD (pg/g)					
	Total PeCDD # Homologues					
	Total-HxCDD (pg/g)					
	Total HxCDD # Homologues					
	Total-HpCDD (pg/g)					
	Total HpCDD # Homologues					
	2,3,7,8-TCDF (pg/g)					
	1,2,3,7,8-PeCDF (pg/g)					
	2,3,4,7,8-PeCDF (pg/g)					
	1,2,3,4,7,8-HxCDF (pg/g)					
	1,2,3,6,7,8-HxCDF (pg/g)					
	1,2,3,7,8,9-HxCDF (pg/g)					
	2,3,4,6,7,8-HxCDF (pg/g)					
	1,2,3,4,6,7,8-HpCDF (pg/g)					
	1,2,3,4,7,8,9-HpCDF (pg/g)					
	OCDF (pg/g)					
	Total-TCDF (pg/g)					
	Total TCDF # Homologues					
	Total-PeCDF (pg/g)					
	Total PeCDF # Homologues					
	Total-HxCDF (pg/g)					
	Total HxCDF # Homologues					
	Total-HpCDF (pg/g)					
	Total HpCDF # Homologues					
	Surrogate: 13C12-2,3,7,8-TCDD (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)					
	Surrogate: 13C12-OCDD (%)					
	Surrogate: 13C12-2,3,7,8-TCDF (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)					
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)					
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)					

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-1	L1730019-2	L1730019-3	L1730019-4	L1730019-5
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16
	Sampled Time	11:23	11:37	11:48	11:57	12:04
	Client ID	PCL30 (0-0.5)	PCL30 (0.5-1.0)	PCL30 (1.0-1.5)	PCL30 (1.5-2.0)	PCL30 (2.0-2.16)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)					
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)					
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)					
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)					
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-6	L1730019-7	L1730019-8	L1730019-9	L1730019-10
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16
	Sampled Time	12:14	12:30	12:40	15:31	15:43
	Client ID	PCL31 (0-0.5)	PCL31 (0.5-1.0)	PCL31 (1.0-1.25)	PCL14 (0-0.5)	PCL14 (0.5-1.0)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)					
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)					
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)					
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)					
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)					

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1730019-11	L1730019-12	L1730019-13	L1730019-14	L1730019-15
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16
Sampled Time	15:51	16:00	16:19	16:26	16:28
Client ID	PCL14 (1.0-1.5)	PCL14 (1.5-2.0)	PCS14 (0-0.2)	PCS14 (0.2-0.4)	PCS14 (0.4-0.6)
Grouping / **Analyte**					
SOIL					
Dioxins and Furans					
Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)			58.0	64.0	66.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)			63.0	67.0	68.0
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)			59.0	61.0	61.0
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)			45.0	53.0	50.0
Toxic Equivalency					
Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)			0.975	0.161	0.0525
Mid Point PCDD/F TEQ (WHO 2005) (pg/g)			1.19	0.294	0.187
Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)			1.21	0.367	0.254

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-16	L1730019-17	L1730019-22	L1730019-23	L1730019-24
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16	29-JAN-16
	Sampled Time	16:35	16:38			
	Client ID	PCS14 (0.6-0.8)	PCS14 (0.8-1.0)	SPLIT 6 (0-0.5)	SPLIT 6 (0.5-1.0)	SPLIT 6 (1.0-1.5)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)	63.0	48.0			
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)	66.0	54.0			
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)	62.0	49.0			
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)	50.0	37.0			
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.0157	0.0742			
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)	0.0963	0.293			
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.176	0.494			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-25	L1730019-26	L1730019-27	L1730019-28	L1730019-29
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	29-JAN-16	29-JAN-16	30-JAN-16	30-JAN-16	30-JAN-16
	Sampled Time			11:30	11:39	11:46
	Client ID	SPLIT 6 (1.5-2.0)	SPLIT 6 (2.0-2.16)	PCL12 (0-0.5)	PCL12 (0.5-1.0)	PCL12 (1.0-1.3)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)					
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)					
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)					
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)					
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)					

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-30	L1730019-31	L1730019-32	L1730019-33	L1730019-34
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	30-JAN-16	30-JAN-16	30-JAN-16	30-JAN-16	30-JAN-16
	Sampled Time	12:00	12:03	12:13	12:22	12:27
	Client ID	PCL13 (0-0.5)	PCL13 (0.5-1.0)	PCL13 (1.0-1.3)	PCS13 (0-0.2)	PCS13 (0.2-0.4)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)				71.0	53.0
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)				74.0	58.0
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)				71.0	52.0
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)				63.0	43.0
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)				0.188	0.0111
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)				0.280	0.105
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)				0.356	0.196

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1730019-35	L1730019-36	L1730019-37	L1730019-38	L1730019-39
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	30-JAN-16	30-JAN-16	30-JAN-16	30-JAN-16	30-JAN-16
Sampled Time	12:32	15:57	16:02	16:07	14:42
Client ID	PCS13 (0.4-0.7)	PCL04 (0-0.5)	PCL04 (0.5-1.0)	PCL04 (1.0-1.5)	SS05
Grouping / **Analyte**					
SOIL					
Dioxins and Furans					
Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)	38.0				
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)	42.0				
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)	38.0				
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)	27.0 G				
Toxic Equivalency					
Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.152				
Mid Point PCDD/F TEQ (WHO 2005) (pg/g)	0.350				
Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.548				

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-40	L1730019-41	L1730019-42	L1730019-43	L1730019-44
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	30-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16
	Sampled Time	14:50	12:12	12:18	12:25	12:41
	Client ID	SS06	PCL02 (0-0.5)	PCL02 (0.5-1.0)	PCL02 (1.0-1.3)	PCS02 (0-0.2)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)	47.0				70.0
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)	50.0				74.0
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)	49.0				71.0
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)	38.0				57.0
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.362				0.311
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)	0.492				0.512
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.623				0.575

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1730019-45	L1730019-46	L1730019-47	L1730019-48	L1730019-49
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	31-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16
Sampled Time	12:48	12:53	12:58	17:59	18:08
Client ID	PCS02 (0.2-0.4)	PCS02 (0.4-0.6)	PCS02 (0.6-0.68)	PCL05 (0-0.5)	PCL05 (0.5-1.0)
Grouping / **Analyte**					
SOIL					
Dioxins and Furans					
Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)	68.0	44.0	70.0		
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)	74.0	47.0	77.0		
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)	69.0	45.0	76.0		
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)	56.0	32.0 G	63.0		
Toxic Equivalency					
Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.204	0.0788	0.00		
Mid Point PCDD/F TEQ (WHO 2005) (pg/g)	0.330	0.196	0.0719		
Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.454	0.309	0.136		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-50	L1730019-51	L1730019-52	L1730019-53	L1730019-54
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	31-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16
	Sampled Time	17:18	17:25	17:31	17:42	17:47
	Client ID	PCL06 (0-0.5)	PCL06 (0.5-1.0)	PCL06 (1.0-1.5)	PCL06 (1.5-2.0)	PCL06 (2.0-2.4)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)					
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)					
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)					
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)					
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1730019-55	L1730019-56	L1730019-57	L1730019-58	L1730019-59
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	31-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16	31-JAN-16
Sampled Time	15:58	16:02	16:08	16:13	16:21
Client ID	PCS06 (0-0.2)	PCS06 (0.2-0.4)	PCS06 (0.4-0.6)	PCS06 (0.6-0.8)	PCS06 (0.8-1.0)
Grouping / **Analyte**					
SOIL					
Dioxins and Furans					
Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)	68.0	68.0	76.0	70.0	29.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)	66.0	73.0	80.0	72.0	34.0
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)	60.0	68.0	77.0	71.0	32.0
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)	61.0	54.0	54.0	47.0	22.0 G
Toxic Equivalency					
Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)	1.73	0.216	0.0245	0.00	0.00
Mid Point PCDD/F TEQ (WHO 2005) (pg/g)	1.95	0.374	0.146	0.119	0.259
Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)	1.97	0.489	0.249	0.237	0.519

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1730019-68				
	Description	SEDIMENT				
	Sampled Date	31-JAN-16				
	Sampled Time	18:17				
	Client ID	PCL05 (1.0-1.2)				
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)					
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)					
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)					
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)					
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comments
L1730019-35	Soil	Note: The recovery of the cleanup standard is marginally below the method control limits. Native target data are not expected to be biased as a result.	
L1730019-46	Soil	Note: The recovery of the cleanup standard is marginally below the method control limits. Native target data are not expected to be biased as a result.	
L1730019-59	Soil	Note: The recoveries of selected surrogates are below the method control limit. The detection limits may be elevated. Native results are not expected to be biased.	

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	1,2,3,4,6,7,8-HpCDF	G	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59

Comments:
The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	2,3,4,6,7,8-HxCDF	G	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59

Comments:
The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	2,3,7,8-TCDF	G	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59

Comments:
The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	OCDF	G	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59

Comments:
The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Total-HpCDF	G	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59

Comments:
The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Total-HxCDD	G	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59

Comments:
The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Total-HxCDF	G	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59

Comments:
The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Total-PeCDF	G	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59

Comments:
The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Total-TCDD	G	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59

Comments:
The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Total-TCDF	G	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59

Comments:
The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	2,3,4,6,7,8-HxCDF	J,R	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59

Comments:
The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside

Reference Information

	Parameter	Qualifier	Applies to Sample Number(s)
	the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.		
Duplicate	2,3,4,7,8-PeCDF	J,R	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Comments:	The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.		
Duplicate	1,2,3,7,8-PeCDD	M,J	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Comments:	The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.		
Duplicate	1,2,3,7,8-PeCDF	M,J,R	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Comments:	The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.		
Duplicate	2,3,7,8-TCDD	M,J,R	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Comments:	The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.		
Method Blank	1,2,3,4,6,7,8-HpCDD	M,U	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Duplicate	1,2,3,4,7,8,9-HpCDF	M,U	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Comments:	The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.		
Duplicate	1,2,3,4,6,7,8-HpCDF	[J]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Comments:	The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.		
Duplicate	1,2,3,6,7,8-HxCDD	[J]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Comments:	The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.		
Duplicate	1,2,3,7,8,9-HxCDD	[J]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Comments:	The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.		
Duplicate	OCDF	[J]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Comments:	The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.		
Method Blank	1,2,3,4,6,7,8-HpCDF	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Method Blank	1,2,3,4,7,8,9-HpCDF	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Method Blank	1,2,3,4,7,8-HxCDD	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Method Blank	1,2,3,4,7,8-HxCDF	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Method Blank	1,2,3,6,7,8-HxCDD	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Method Blank	1,2,3,6,7,8-HxCDF	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Method Blank	1,2,3,7,8,9-HxCDD	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Method Blank	1,2,3,7,8,9-HxCDF	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -

Reference Information

	Parameter	Qualifier	Applies to Sample Number(s)
			45, -46, -47, -55, -56, -57, -58, -59
Method Blank	1,2,3,7,8-PeCDD	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Method Blank	1,2,3,7,8-PeCDF	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Method Blank	2,3,4,6,7,8-HxCDF	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Method Blank	2,3,4,7,8-PeCDF	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Method Blank	2,3,7,8-TCDD	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Method Blank	2,3,7,8-TCDF	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Method Blank	OCDD	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Method Blank	OCDF	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Method Blank	Total-HpCDD	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Method Blank	Total-HpCDF	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Method Blank	Total-HxCDD	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Method Blank	Total-HxCDF	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Method Blank	Total-PeCDD	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Method Blank	Total-PeCDF	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Method Blank	Total-TCDD	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Method Blank	Total-TCDF	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Duplicate	1,2,3,4,7,8-HxCDD	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Comments:	The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.		
Duplicate	1,2,3,4,7,8-HxCDF	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Comments:	The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.		
Duplicate	1,2,3,6,7,8-HxCDF	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Comments:	The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.		
Duplicate	1,2,3,7,8,9-HxCDF	[U]	L1730019-13, -14, -15, -16, -17, -33, -34, -35, -40, -44, -45, -46, -47, -55, -56, -57, -58, -59
Comments:	The replication between the sample and duplicate is outside method control limit for 2,3,7,8-TCDF. The replication is also outside the limits for selected low level detected values that are below the calibrated range. The RPDs for the TEQ values are within limits. The sample appears homogeneous.		

Qualifiers for Individual Parameters Listed:

Qualifier	Description
G	QC result did not meet ALS DQO. Refer to narrative comments for further information.
J,R	The analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,J	A peak has been manually integrated, and the analyte was detected below the calibrated range but above the EDL.
M,J,R	A peak has been manually integrated, the analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,U	A peak has been manually integrated, and the analyte was not detected above the EDL.

Reference Information

[J] The analyte was detected below the calibrated range but above the EDL.

[U] The analyte was not detected above the EDL.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-TOT-ORG-LECO-SK	Soil	Organic Carbon by combustion method	SSSA (1996) p. 973

Total Organic Carbon (C-TOT-ORG-LECO-SK, C-TOT-ORG-SK)

Total C and inorganic C are determined on separate samples. The total C is determined by combustion and thermal conductivity detection, while inorganic C is determined by weight lass after addition of hydrochloric acid. Organic C is calculated by the difference between these two determinations.

Reference for Total C:
Nelson, D.W. and Sommers, L.E. 1996. Total Carbon, organic carbon and organic matter. P. 961-1010 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

Reference for Inorganic C:
Loeppert, R.H. and Suarez, D.L. 1996. Gravimetric Method for Loss of Carbon Dioxide. P. 455-456 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

CL-PASTE-COLOR-VA	Soil	Chloride in Soil (Paste) by Colourimetry	Carter-CSSS / APHA 4500-Cl E (modified)

A soil extract produced by the saturated paste extraction procedure is analyzed for chloride by ferricyanide colourimetry.

DX-1613B-HRMS-BU	Soil	Dioxins and Furans HR 1613B	USEPA 1613B

Samples are extracted by Soxhlet. The extracts are prepared using column chromatography, reduced in volume and analyzed by isotope-dilution GC/HRMS

HG-200.2-CVAF-VA	Soil	Mercury in Soil by CVAFS	EPA 200.2/1631E (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAFS.

HG-WW-200.2-CVAF-VA	Soil	Hg in Soil by CVAFS	EPA 200.2/245.7

This analysis is carried out using procedures from CSR Analytical Method: "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, 26 June 2009, and procedures adapted from EPA Method 200.2. The sample is manually homogenized, sieved (wet sample) through a 2 mm (10 mesh) sieve, and a representative subsample of the material is weighed. The sample is then digested at 95 degrees Celsius for 2 hours by block digester using concentrated nitric and hydrochloric acids. Instrumental analysis is by atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

MET-200.2-CCMS-VA	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample matrix, for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V.

MET-PASTE-ICP-VA	Soil	Metals in Soil (Paste) by ICPOES	Carter-CSSS / EPA 6010B (modified)

A soil extract produced by the saturated paste extraction procedure is analyzed for Sodium, Calcium, and Magnesium by ICPOES as per "Soil Sampling and Methods of Analysis" by M. Carter.

MET-WW-200.2-CCMS-VA	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample matrix, for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V.

MOIST-SK	Soil	Moisture Content	ASTM D2216-80

The weighed portion of soil is placed in a 105°C oven overnight. The dried soil is allowed to cooled to room temperature, weighed and the % moisture is calculated.

Reference: ASTM D2216-80

Reference Information

MOISTURE-SIEVE-VA	Soil	Moisture for CSR Metals Calculations	ASTM D2974-00 Method A

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

MOISTURE-VA	Soil	Moisture content	ASTM D2974-00 Method A

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

PAH-BCCSR-CL	Soil	PAHs - BC CSR Regs	EPA 3570/8270-GC/MS
PAH-SUM-CALC-VA	Soil	Sum of PAH's	CALCULATION

Total PAH represents the sum of all PAH analytes reported for a given sample. Note that regulatory agencies and criteria differ in their definitions of Total PAH in terms of the individual PAH analytes to be included.

PCB-CSR-SUM-CALC-VA	Soil	Total PCB (BC CSR) in soil	BC Contaminated Sites Regulation

Calculation of Total PCB to meet BC Contaminated Sites Regulation. Total PCB (BC CSR) is the sum of the concentrations of PCB aroclors 1242, 1248, 1254 and 1260. Results below detection limit (DL) are treated as zero. The Total PCB detection limit is equal to the highest of the aroclor detection limits used in the sum.

PCB-SE-ECD-VA	Soil	PCB by Extraction with GCECD	EPA8082, 3630

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3500, 3620, 3630, 3660, 3665 & 8082, published by the United States Environmental Protection Agency (EPA). The procedure involves a solid-liquid extraction of a subsample of the sediment/soil using a mixture of hexane and acetone. Water is added to the extract and the resulting hexane extract undergoes one or more of the following clean-up procedures (if required): florisil clean-up, silica gel clean-up, sulphur clean-up and/or sulphuric acid clean-up. The final extract is analysed by capillary column gas chromatography with electron capture detection (GC/ECD).

PCB-SUM-CALC-VA	Soil	Total PCBs in soil	CALCULATION

Calculation of Total PCB. Total PCB is the sum of the concentrations of PCB aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, and 1268. Results below detection limit (DL) are treated as zero. The Total PCB detection limit is equal to the highest of the aroclor detection limits used in the sum.

PSA-PIPET-DETAIL-SK	Soil	Particle size - Sieve and Pipette	SSIR-51 METHOD 3.2.1

Particle size distribution is determined by a combination of techniques. Dry sieving is performed for coarse particles, wet sieving for sand particles and the pipette sedimentation method for clay particles.

Reference:

Burt, R. (2009). Soil Survey Field and Laboratory Methods Manual. Soil Survey Investigations Report No. 5. Method 3.2.1.2.2. United States Department of Agriculture Natural Resources Conservation Service.

SAT-PCNT-VA	Soil	Saturation Percentage	Carter-CSSS

Saturation Percentage (SP) is the total volume of water present in a saturated paste (in mL) divided by the dry weight of the sample (in grams), expressed as a percentage, as described in "Soil Sampling and Methods of Analysis" by M. Carter.

WHO1998-FISH-EDL-BU	Soil	WHO1998Toxic Equivalency-Fish ND=EDL	Calculation
WHO1998-FISH-HALF-BU	Soil	WHO1998Toxic Equivalency-Fish ND=1/2EDL	Calculation
WHO1998-FISH-ZERO-BU	Soil	WHO1998Toxic Equivalency-Fish ND=0	Calculation

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

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istody / Analytical Request Form
la Toll Free: 1 800 668 9878
www.alsglobal.com

COC # N/A

Page 1 of 5

Report To		Report Format / Distribution		Service Requested (Rush for routine analysis subject to availability)
Company:	Stantec Consulting Ltd.	☑ Standard ☐ Other		◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Molly Brewis	☑ PDF ☑ Excel ☐ Digital ☐ Fax		○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400A-2261 Keating Cross Road	Email 1: molly.brewis@stantec.com		○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saanichton, BC V8M 2A5	Email 2: karen.munro@stantec.com		○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-858-9969 Fax: 250-544-1105	Email 3: stefan.dick@stantec.com		
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information		Analysis Request
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 123220054 task 225.101		Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:		PO / AFE:		
Contact:		LSD:		
Address:				
Phone:	Fax:	Quote #:		
Lab Work Order # (lab use only)		ALS Contact: Brent Mack	Sampler: SW & BT	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-OD-200.2-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU		Archive			Number of Containers
	PCL30 (0-0.5)	29-Jan-16	11:23	SEDIMENT	X	X	X	X	X	X	X						3
	PCL30 (0.5-1.0)	29-Jan-16	11:37	SEDIMENT	X	X	X	X	X	X	X						3
	PCL30 (1.0-1.5)	29-Jan-16	11:48	SEDIMENT	X	X	X	X	X	X	X						3
	PCL30 (1.5-2.0)	29-Jan-16	11:57	SEDIMENT				X	X					X			2
	PCL30 (2.0-2.16)	29-Jan-16	12:04	SEDIMENT				X	X					X			2
	PCL31 (0-0.5)	29-Jan-16	12:14	SEDIMENT	X	X	X	X	X	X	X						3
	PCL31 (0.5-1.0)	29-Jan-16	12:30	SEDIMENT	X	X	X	X	X	X	X						3
	PCL31 (1.0-1.25)	29-Jan-16	12:40	SEDIMENT	X	X	X	X	X	X	X						3
	PCL14 (0-0.5)	29-Jan-16	15:31	SEDIMENT	X	X	X	X	X	X	X						3
	PCL14 (0.5-1.0)	29-Jan-16	15:43	SEDIMENT	X	X	X	X	X	X	X						3
	PCL14 (1.0-1.5)	29-Jan-16	15:51	SEDIMENT	X	X	X	X	X	X	X						3
	PCL14 (1.5-2.0)	29-Jan-16	16:00	SEDIMENT				X	X					X			2
	PSS14 (0 -0.2)	29-Jan-16	16:19	SEDIMENT				X	X	X		X					2
	PSS14 (0.2 -0.4)	29-Jan-16	16:26	SEDIMENT				X	X	X		X					2
	PSS14 (0.4 -0.6)	29-Jan-16	16:28	SEDIMENT				X	X	X		X					2

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Detailed breakdown of particle size for clay and silt fractions. Dioxins and Furans to be reported with WHO 1998 fish TEQs. Some samples for analysis AND archival. Archived samples to be held for 6 months.

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Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Sandra Warren	1-Feb-16	8:00	Jean	FEB - 2 2016	11:30	1.2, 2.2, 4.1, 6.4 °C ~~6.3~~ 2.4 °C				

GENF 18.01 Front

ALS Environmental

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COC # N/A

Report To		Report Format / Distribution		Service Requested (Rush for routine analysis subject to availability)
Company:	Stantec Consulting Ltd.	☑ Standard ☐ Other		◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Molly Brewis	☑ PDF ☑ Excel ☐ Digital ☐ Fax		○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400A-2261 Keating Cross Road	Email 1: molly.brewis@stantec.com		○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saanichton, BC V8M 2A5	Email 2: karen.munro@stantec.com		○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-858-9969 Fax: 250-544-1105	Email 3: stefan.dick@stantec.com		
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information		Analysis Request
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 123220054 task 225.101		Please Indicate below Filtered, Preserved or both (F, P, F/P)
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Contact:		LSD:		
Address:				
Phone:	Fax:	Quote #:		
Lab Work Order # (lab use only)		ALS Contact: Brent Mack	Sampler: SW & BT	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-OD-200.2-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU		Archive			Number of Containers
	PSS14 (0.6-0.8)	29-Jan-16	16:35	SEDIMENT				X	X	X		X					2
	PSS14 (0.8-1.0)	29-Jan-16	16:38	SEDIMENT				X	X	X		X					2
	PSS14 (1.0-1.2)	29-Jan-16	16:42	SEDIMENT										X			2
	PSS14 (1.2-1.4)	29-Jan-16	16:45	SEDIMENT										X			2
	PSS14 (1.4-1.6)	29-Jan-16	16:49	SEDIMENT										X			2
	PSS14 (1.6-1.8)	29-Jan-16	16:53	SEDIMENT										X			2
	SPLIT 6 (0-0.5)	29-Jan-16		SEDIMENT	X	X	X	X	X	X	X						3
	SPLIT 6 (0.5-1.0)	29-Jan-16		SEDIMENT	X	X	X	X	X	X	X						3
	SPLIT 6 (1.0-1.5)	29-Jan-16		SEDIMENT	X	X	X	X	X	X	X						3
	SPLIT 6 (1.5-2.0)	29-Jan-16		SEDIMENT				X	X					X			2
	SPLIT 6 (2.0-2.16)	29-Jan-16		SEDIMENT				X	X					X			2
	PCL12 (0-0.5)	30-Jan-16	11:30	SEDIMENT	X	X	X	X	X	X	X						3
	PCL12 (0.5-1.0)	30-Jan-16	11:39	SEDIMENT	X	X	X	X	X	X	X						3
	PCL12 (1.0-1.3)	30-Jan-16	11:46	SEDIMENT	X	X	X	X	X	X	X						3
	PCL13 (0-0.5)	30-Jan-16	12:00	SEDIMENT	X	X	X	X	X	X	X						3

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

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Sandra Warren	1-FEB-16 ~~31-Jan-16~~	8:00 ~~7:00~~	Jean	FEB - 2 2016	11:30	1.2, 2.2, 3.4 4.1, 6.4 °C				

6.3, 2.4 °C

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COC # N/A

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Lab Work Order # (lab use only)		**ALS Contact:** Brent Mack	**Sampler:** SW & BT	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-OD-200.2-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU		Archive			Number of Containers
	PCL13 (0.5-1.0)	30-Jan-16	12:03	SEDIMENT	X	X	X	X	X	X	X						3
	PCL13 (1.0-1.3)	30-Jan-16	12:13	SEDIMENT	X	X	X	X	X	X	X						3
	PCS13 (0-0.2)	30-Jan-16	12:22	SEDIMENT				X	X	X		X					2
	PCS13 (0.2-0.4)	30-Jan-16	12:27	SEDIMENT				X	X	X		X					2
	PCS13 (0.4-0.7)	30-Jan-16	12:32	SEDIMENT				X	X	X		X					2
	PCL04 (0-0.5)	30-Jan-16	15:57	SEDIMENT	X	X	X	X	X	X	X						3
	PCL04 (0.5-1.0)	30-Jan-16	16:02	SEDIMENT	X	X	X	X	X	X	X						3
	PCL04 (1.0-1.5)	30-Jan-16	16:07	SEDIMENT	X	X	X	X	X	X	X						3
	SS05	30-Jan-16	14:42	SEDIMENT	X	X	X	X	X	X	X						3
	SS06	30-Jan-16	14:50	SEDIMENT	X	X	X	X	X	X	X	X					4
	PCL02 (0-0.5)	31-Jan-16	12:12	SEDIMENT	X	X	X	X	X	X	X						3
	PCL02 (0.5-1.0)	31-Jan-16	12:18	SEDIMENT	X	X	X	X	X	X	X						3
	PCL02 (1.0-1.3)	31-Jan-16	12:25	SEDIMENT	X	X	X	X	X	X	X						3
	PCS02 (0-0.2)	31-Jan-16	12:41	SEDIMENT				X	X	X		X					2
	PCS02 (0.2-0.4)	31-Jan-16	12:48	SEDIMENT				X	X	X		X					2

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

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Sandra Warren	01-FEB-16 ~~01-Jan-16~~	8:00 ~~7:00~~	Jean	FEB - 2 2016	11:30	1.2, 2.2, 3.4 4.1, 6.4 °C 6.3, 2.4 °C				

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COC # N/A

Page 4 of 5

Report To		**Report Format / Distribu**	**Service Requested** (Rush for routine analysis subject to availability)
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	Saanichton, BC V8M 2A5	Email 2: karen.munro@stantec.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-858-9969 Fax: 250-544-1105	Email 3: stefan.dick@stantec.com	**Analysis Request**
Invoice To	Same as Report ? ☑ Yes ☐ No	**Client / Project Information**	Please Indicate below Filtered, Preserved or both (F, P, F/P)
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Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #:	

Lab Work Order # (lab use only):

ALS Contact: Brent Mack **Sampler:** SW & BT

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-OD-200.2-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU		Archive			Number of Containers
	PCS02 (0.4-0.6)	31-Jan-16	12:53	SEDIMENT				X	X	X		X					2
	PCS02 (0.6-0.68)	31-Jan-16	12:58	SEDIMENT				X	X	X		X					2
	PCL05 (0-0.5)	31-Jan-16	17:59	SEDIMENT	X	X	X	X	X	X	X						3
	PCL05 (0.5-1.0)	31-Jan-16	18:08	SEDIMENT	X	X	X	X	X	X	X						3
	PCL06 (0-0.5)	31-Jan-16	17:18	SEDIMENT	X	X	X	X	X	X	X						3
	PCL06 (0.5-1.0)	31-Jan-16	17:25	SEDIMENT	X	X	X	X	X	X							2
	PCL06 (1.0-1.5)	31-Jan-16	17:31	SEDIMENT	X	X	X	X	X	X	X						3
	PCL06 (1.5-2.0)	31-Jan-16	17:42	SEDIMENT				X	X					X			2
	PCL06 (2.0-2.4)	31-Jan-16	17:47	SEDIMENT				X	X					X			2
	PCS06 (0-0.2)	31-Jan-16	15:58	SEDIMENT				X	X	X		X					2
	PCS06 (0.2-0.4)	31-Jan-16	16:02	SEDIMENT				X	X	X		X					2
	PCS06 (0.4-0.6)	31-Jan-16	16:08	SEDIMENT				X	X	X		X					2
	PCS06 (0.6-0.8)	31-Jan-16	16:13	SEDIMENT				X	X	X		X					2
	PCS06 (0.8-1.0)	31-Jan-16	16:21	SEDIMENT				X	X	X		X					2

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Detailed breakdown of particle size for clay and silt fractions. Dioxins and Furans to be reported with WHO 1998 fish TEQs. Some samples for analysis AND archival. Archived samples to be held for 6 months.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Sandra Warren	1-Feb-16	8:00	Jean	FEB - 2 2016	11:30	2.2, 2.3, 4.1, 6.4, 6.3, 2.4°C				

GENF 18.01 Front

ALS Environmental

L1730019-COFC

COC # N/A

Report To					
Company:	Stantec Consulting Ltd.	☑ Standard	☐ Other		
Contact:	Molly Brewis	☑ PDF	☑ Excel	☐ Digital	☐ Fax
Address:	400A-2261 Keating Cross Road	Email 1:	molly.brewis@stantec.com		
	Saanichton, BC V8M 2A5	Email 2:	karen.munro@stantec.com		
Phone:	250-858-9969 Fax: 250-544-1105	Email 3:	stefan.dick@stantec.com		
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information			
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #:	123220054 task 225.101		
Company:		PO / AFE:			
Contact:		LSD:			
Address:					
Phone:	Fax:	Quote #:			
Lab Work Order # (lab use only)		ALS Contact:	Brent Mack	Sampler:	SW & BT

Service Requested (Rush for routine analysis subject to availability)

- ◉ Regular (Standard Turnaround Times - Business Days)
- ○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
- ○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
- ○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT

Analysis Request

Please indicate below Filtered, Preserved or both (F, P, F/P)

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-OD-200.2-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU		Archive			Number of Containers
	PCS06 (1.0-1.2)	31-Jan-16	16:28	SEDIMENT										X			2
	PCS06 (1.2-1.4)	31-Jan-16	16:32	SEDIMENT										X			2
	PCS06 (1.4-1.6)	31-Jan-16	16:37	SEDIMENT										X			2
	PCS06 (1.6-1.8)	31-Jan-16	16:42	SEDIMENT										X			2
	PCS06 (1.8-2.0)	31-Jan-16	16:47	SEDIMENT										X			2
	PCS06 (2.0-2.2)	31-Jan-16	16:52	SEDIMENT										X			2
	PCS06 (2.2-2.4)	31-Jan-16	17:00	SEDIMENT										X			2
	PCS06 (2.4-2.7)	31-Jan-16	17:04	SEDIMENT										X			2
	PCL05 (1.0 1.2)	31-Jan-16	18:17	SEDIMENT	X	X	X	X	X	X	X						3

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Detailed breakdown of particle size for clay and silt fractions. Some samples for analysis AND archival. Archived samples to be held for 6 months.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

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Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Sandra Warren	1-Feb-16	8:00	Jean	FEB - 2 2016	11:30	1-2, 2.2, 3.4 4-1, 6.4, 6.3, 2.4 °C				

GENF 18.01 Front

STANTEC CONSULTING LTD.
ATTN: Molly Brewis
400 - 2261 Keating Cross Road
Saanichton BC V8M 2A5

Date Received: 04-FEB-16
Report Date: 04-APR-16 17:55 (MT)
Version: FINAL REV. 3

Client Phone: 250-655-6979

Certificate of Analysis

Lab Work Order #: L1731264

Project P.O. #: NOT SUBMITTED
Job Reference: 123220054 TASK 525.100
C of C Numbers:
Legal Site Desc:

Comments: 4-APR-2016 This report replaces the previous version and contains only PAH analytes relevant to Ocean Disposal, and a recalculation of Total PAHs.

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1731264-1 SEDIMENT 01-FEB-16 13:26 PCS08 (0-0.2)	L1731264-2 SEDIMENT 01-FEB-16 13:31 PCS08 (0.2.-0.4)	L1731264-3 SEDIMENT 01-FEB-16 13:35 PCS08 (0.4-0.6)	L1731264-4 SEDIMENT 01-FEB-16 13:40 PCS08 (0.6-0.8)	L1731264-5 SEDIMENT 01-FEB-16 13:46 PCS08 (0.8-1.06)
Sample ID						
Description						
Sampled Date						
Sampled Time						
Client ID						
SOIL						
Physical Tests	% Moisture (%)	31.3	27.8	27.4	24.8	22.1
	Moisture (%)					
Particle Size	% Gravel (>2mm) (%)	0.32	0.38	0.55	0.74	7.51
	% Sand (2.00mm - 1.00mm) (%)	0.64	1.41	1.69	1.81	6.70
	% Sand (1.00mm - 0.50mm) (%)	1.54	1.47	2.26	4.10	7.70
	% Sand (0.50mm - 0.25mm) (%)	5.10	5.34	7.37	10.6	11.8
	% Sand (0.25mm - 0.125mm) (%)	24.4	27.5	31.7	36.8	29.8
	% Sand (0.125mm - 0.063mm) (%)	10.4	10.5	10.4	9.56	9.89
	% Silt (0.063mm - 0.0312mm) (%)	12.6	11.4	10.3	8.69	7.30
	% Silt (0.0312mm - 0.004mm) (%)	25.9	23.5	19.7	16.3	10.8
	% Clay (<4um) (%)	19.0	18.6	16.1	11.4	8.41
	Texture	Loam	Loam	Sandy loam	Sandy loam	Sandy loam
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.28	1.07	0.98	0.85	0.72
Saturated Paste Extractables	Chloride (Cl) (mg/kg)					
	% Saturation (%)					
	Sodium (Na) (mg/kg)					
Metals	Arsenic (As) (mg/kg)					
	Cadmium (Cd) (mg/kg)					
	Chromium (Cr) (mg/kg)					
	Copper (Cu) (mg/kg)					
	Lead (Pb) (mg/kg)					
	Mercury (Hg) (mg/kg)					
	Nickel (Ni) (mg/kg)					
	Zinc (Zn) (mg/kg)					
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)					
	Acenaphthylene (mg/kg)					
	Anthracene (mg/kg)					
	Benz(a)anthracene (mg/kg)					
	Benzo(a)pyrene (mg/kg)					
	Benzo(b&j)fluoranthene (mg/kg)					
	Benzo(g,h,i)perylene (mg/kg)					
	Benzo(k)fluoranthene (mg/kg)					
	Chrysene (mg/kg)					
	Dibenz(a,h)anthracene (mg/kg)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731264-6	L1731264-7	L1731264-8	L1731264-9	L1731264-10
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	01-FEB-16	01-FEB-16	01-FEB-16	02-FEB-16	02-FEB-16
	Sampled Time	14:01	14:08	14:11	10:37	10:42
	Client ID	PCL08 (0-0.5)	PCL08 (0.5-1.0)	PCL08 (1.0-1.3)	PCL29 (0-0.5)	PCL29 (0.5-1.0)
Grouping	**Analyte**					
SOIL						
Physical Tests	% Moisture (%)					
	Moisture (%)	31.3	25.4	20.9	32.5	25.5
Particle Size	% Gravel (>2mm) (%)	0.23	1.43	13.6	0.67	0.36
	% Sand (2.00mm - 1.00mm) (%)	1.40	3.49	6.67	1.43	2.53
	% Sand (1.00mm - 0.50mm) (%)	2.17	4.92	7.02	2.10	5.28
	% Sand (0.50mm - 0.25mm) (%)	5.76	9.91	10.7	4.42	13.6
	% Sand (0.25mm - 0.125mm) (%)	23.6	35.0	29.2	13.9	17.5
	% Sand (0.125mm - 0.063mm) (%)	10.6	10.0	12.5	17.9	17.2
	% Silt (0.063mm - 0.0312mm) (%)	12.1	7.77	6.47	14.2	11.1
	% Silt (0.0312mm - 0.004mm) (%)	24.7	15.0	7.67	25.6	17.9
	% Clay (<4um) (%)	19.4	12.4	6.15	19.8	14.6
	Texture	Loam	Sandy loam	Loamy sand	Loam	Sandy loam
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.08	1.01	0.57	1.32	0.95
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	6070	4430	3220	5900	4540
	% Saturation (%)	51.6	39.8	31.1	55.4	40.2
	Sodium (Na) (mg/kg)	3050	2280	1630	3120	2390
Metals	Arsenic (As) (mg/kg)	11.3	8.53	5.86	9.27	8.03
	Cadmium (Cd) (mg/kg)	0.154	0.200	0.239	0.166	0.168
	Chromium (Cr) (mg/kg)	23.8	16.4	14.2	23.6	19.2
	Copper (Cu) (mg/kg)	25.3	19.4	12.3	24.4	14.9
	Lead (Pb) (mg/kg)	7.21	4.51	2.98	6.41	3.82
	Mercury (Hg) (mg/kg)	0.0375	0.0216	0.0143	0.0424	0.0217
	Nickel (Ni) (mg/kg)	19.6	13.2	10.1	19.3	13.9
	Zinc (Zn) (mg/kg)	65.0	43.2	31.7	67.5	50.0
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Acenaphthylene (mg/kg)	<0.0050	<0.0050	<0.0050	0.0051	<0.0050
	Anthracene (mg/kg)	0.0046	<0.0040	<0.0040	0.0115	<0.0040
	Benz(a)anthracene (mg/kg)	<0.010	<0.010	<0.010	0.028	<0.010
	Benzo(a)pyrene (mg/kg)	<0.010	<0.010	<0.010	0.024	<0.010
	Benzo(b&j)fluoranthene (mg/kg)	0.022	<0.010	<0.010	0.033	<0.010
	Benzo(g,h,i)perylene (mg/kg)	<0.010	<0.010	<0.010	0.014	<0.010
	Benzo(k)fluoranthene (mg/kg)	<0.010	<0.010	<0.010	0.010	<0.010
	Chrysene (mg/kg)	0.021	<0.010	<0.010	0.026	<0.010
	Dibenz(a,h)anthracene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1731264-11 SEDIMENT 02-FEB-16 10:46 PCL29 (1.0-1.5)	L1731264-12 SEDIMENT 02-FEB-16 10:55 PCL29 (1.5-2.0)	L1731264-13 SEDIMENT 02-FEB-16 10:59 PCL29 (2.0-2.34)	L1731264-14 SEDIMENT 02-FEB-16 12:04 PCS32 (0-0.2)	L1731264-15 SEDIMENT 02-FEB-16 12:05 PCS32 (0.2-0.4)
SOIL						
Physical Tests	% Moisture (%)		20.0	16.9	29.4	29.0
	Moisture (%)	22.1				
Particle Size	% Gravel (>2mm) (%)	1.93	0.59	2.89	1.29	2.63
	% Sand (2.00mm - 1.00mm) (%)	3.80	3.44	2.27	3.02	6.63
	% Sand (1.00mm - 0.50mm) (%)	8.36	12.8	11.1	4.67	5.05
	% Sand (0.50mm - 0.25mm) (%)	24.3	33.7	46.0	9.55	7.74
	% Sand (0.25mm - 0.125mm) (%)	23.4	18.0	16.5	23.1	21.4
	% Sand (0.125mm - 0.063mm) (%)	14.8	12.7	7.15	11.9	13.4
	% Silt (0.063mm - 0.0312mm) (%)	6.93	6.99	4.60	9.88	9.94
	% Silt (0.0312mm - 0.004mm) (%)	8.86	7.07	5.34	19.6	18.3
	% Clay (<4um) (%)	7.72	4.64	4.20	17.1	14.9
	Texture	Loamy sand	Loamy sand	Loamy sand	Sandy loam	Sandy loam
Organic / Inorganic Carbon	Total Organic Carbon (%)	0.32			1.11	0.91
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	3630				
	% Saturation (%)	28.6				
	Sodium (Na) (mg/kg)	2010				
Metals	Arsenic (As) (mg/kg)	6.88				
	Cadmium (Cd) (mg/kg)	0.236				
	Chromium (Cr) (mg/kg)	15.4				
	Copper (Cu) (mg/kg)	10.8				
	Lead (Pb) (mg/kg)	2.54				
	Mercury (Hg) (mg/kg)	0.0131				
	Nickel (Ni) (mg/kg)	9.31				
	Zinc (Zn) (mg/kg)	34.1				
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.0050				
	Acenaphthylene (mg/kg)	<0.0050				
	Anthracene (mg/kg)	<0.0040				
	Benz(a)anthracene (mg/kg)	<0.010				
	Benzo(a)pyrene (mg/kg)	<0.010				
	Benzo(b&j)fluoranthene (mg/kg)	<0.010				
	Benzo(g,h,i)perylene (mg/kg)	<0.010				
	Benzo(k)fluoranthene (mg/kg)	<0.010				
	Chrysene (mg/kg)	<0.010				
	Dibenz(a,h)anthracene (mg/kg)	<0.0050				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731264-16	L1731264-17	L1731264-18	L1731264-23	L1731264-24
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16
	Sampled Time	12:09	12:11	12:15	13:46	13:50
	Client ID	PCS32 (0.4-0.6)	PCS32 (0.6-0.8)	PCS32 (0.8-1.0)	PCL23 (0-0.5)	PCL23 (0.5-1.0)
Grouping	**Analyte**					
SOIL						
Physical Tests	% Moisture (%)	25.7	25.9	22.9		
	Moisture (%)				22.4	23.8
Particle Size	% Gravel (>2mm) (%)	2.49	2.90	4.13	1.50	2.55
	% Sand (2.00mm - 1.00mm) (%)	4.30	6.18	10.2	2.66	3.76
	% Sand (1.00mm - 0.50mm) (%)	6.08	6.50	11.4	3.06	4.54
	% Sand (0.50mm - 0.25mm) (%)	7.91	11.5	17.3	13.2	8.58
	% Sand (0.25mm - 0.125mm) (%)	21.8	23.8	25.5	47.0	39.3
	% Sand (0.125mm - 0.063mm) (%)	14.3	13.4	10.0	9.93	15.6
	% Silt (0.063mm - 0.0312mm) (%)	10.5	8.85	5.68	5.69	7.53
	% Silt (0.0312mm - 0.004mm) (%)	18.8	15.2	8.61	9.33	10.0
	% Clay (<4um) (%)	13.9	11.7	7.12	7.61	8.11
	Texture	Sandy loam	Sandy loam	Loamy sand	Loamy sand	Sandy loam / Loamy sand
Organic / Inorganic Carbon	Total Organic Carbon (%)	0.82	0.97	0.60	0.73	0.81
Saturated Paste Extractables	Chloride (Cl) (mg/kg)				2760	3930
	% Saturation (%)				29.6	31.6
	Sodium (Na) (mg/kg)				1470	2290
Metals	Arsenic (As) (mg/kg)				5.45	5.77
	Cadmium (Cd) (mg/kg)				0.137	0.157
	Chromium (Cr) (mg/kg)				18.2	16.8
	Copper (Cu) (mg/kg)				11.7	10.5
	Lead (Pb) (mg/kg)				3.68	3.13
	Mercury (Hg) (mg/kg)				0.0176	0.0132
	Nickel (Ni) (mg/kg)				9.91	9.96
	Zinc (Zn) (mg/kg)				44.4	42.9
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)				<0.0050	<0.0050
	Acenaphthylene (mg/kg)				<0.0050	<0.0050
	Anthracene (mg/kg)				<0.0040	<0.0040
	Benz(a)anthracene (mg/kg)				<0.010	<0.010
	Benzo(a)pyrene (mg/kg)				<0.010	<0.010
	Benzo(b&j)fluoranthene (mg/kg)				<0.010	<0.010
	Benzo(g,h,i)perylene (mg/kg)				<0.010	<0.010
	Benzo(k)fluoranthene (mg/kg)				<0.010	<0.010
	Chrysene (mg/kg)				<0.010	<0.010
	Dibenz(a,h)anthracene (mg/kg)				<0.0050	<0.0050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731264-25	L1731264-26	L1731264-27	L1731264-28	L1731264-29
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16
	Sampled Time	13:54	14:00	14:04	14:50	15:00
	Client ID	PCL23 (1.0-1.5)	PCL23 (1.5-2.0)	PCL23 (2.0-2.2)	SS12 (0-0.075)	SS14 (0-0.075)
Grouping	**Analyte**					
SOIL						
Physical Tests	% Moisture (%)		19.1	13.0		
	Moisture (%)	26.9			48.6	35.1
Particle Size	% Gravel (>2mm) (%)	4.36	6.61	13.6	0.20	0.18
	% Sand (2.00mm - 1.00mm) (%)	7.17	6.78	7.50	0.56	0.61
	% Sand (1.00mm - 0.50mm) (%)	5.95	6.47	8.85	0.62	0.96
	% Sand (0.50mm - 0.25mm) (%)	7.23	8.16	9.58	1.29	4.22
	% Sand (0.25mm - 0.125mm) (%)	34.7	34.2	14.2	7.94	24.7
	% Sand (0.125mm - 0.063mm) (%)	16.8	18.1	14.1	12.1	23.5
	% Silt (0.063mm - 0.0312mm) (%)	6.77	6.93	10.9	16.0	13.5
	% Silt (0.0312mm - 0.004mm) (%)	8.73	6.54	13.3	37.4	20.2
	% Clay (<4um) (%)	8.31	6.19	7.96	23.9	12.1
	Texture	Loamy sand	Loamy sand	Sandy loam	Silt loam	Sandy loam
Organic / Inorganic Carbon	Total Organic Carbon (%)	0.71			1.38	1.60
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	3700			11000	5210
	% Saturation (%)	34.4			70.2	42.1
	Sodium (Na) (mg/kg)	1970			6490	2990
Metals	Arsenic (As) (mg/kg)	5.91			8.74	6.14
	Cadmium (Cd) (mg/kg)	0.204			0.165	0.112
	Chromium (Cr) (mg/kg)	14.5			28.7	19.6
	Copper (Cu) (mg/kg)	9.23			41.8	20.9
	Lead (Pb) (mg/kg)	2.86			10.8	6.64
	Mercury (Hg) (mg/kg)	0.0158			0.0820	0.0660
	Nickel (Ni) (mg/kg)	9.08			23.1	13.7
	Zinc (Zn) (mg/kg)	34.9			89.6	57.3
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.0050			<0.0050	<0.0050
	Acenaphthylene (mg/kg)	<0.0050			0.0074	<0.0050
	Anthracene (mg/kg)	<0.0040			0.0259	0.0083
	Benz(a)anthracene (mg/kg)	<0.010			0.049	0.016
	Benzo(a)pyrene (mg/kg)	<0.010			0.040	0.013
	Benzo(b&j)fluoranthene (mg/kg)	<0.010			0.076	0.025
	Benzo(g,h,i)perylene (mg/kg)	<0.010			0.024	<0.010
	Benzo(k)fluoranthene (mg/kg)	<0.010			0.025	<0.010
	Chrysene (mg/kg)	<0.010			0.078	0.025
	Dibenz(a,h)anthracene (mg/kg)	<0.0050			0.0077	<0.0050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1731264-30 SEDIMENT 02-FEB-16 15:25 SS16 (0-0.075)	L1731264-31 SEDIMENT 02-FEB-16 15:49 SS18 (0-0.075)	L1731264-32 SEDIMENT 02-FEB-16 SPLIT 8 (0-0.5)	L1731264-33 SEDIMENT 02-FEB-16 SPLIT 8 (0.5-1.0)	L1731264-34 SEDIMENT 02-FEB-16 SPLIT 8 (1.0-1.5)
SOIL						
Physical Tests	% Moisture (%)					
	Moisture (%)	40.5	19.7	20.5	21.8	23.3
Particle Size	% Gravel (>2mm) (%)	0.15	0.69	1.98	3.57	3.87
	% Sand (2.00mm - 1.00mm) (%)	0.56	3.04	2.87	6.24	5.23
	% Sand (1.00mm - 0.50mm) (%)	0.70	12.4	3.24	6.30	6.98
	% Sand (0.50mm - 0.25mm) (%)	3.17	37.5	12.4	8.95	7.82
	% Sand (0.25mm - 0.125mm) (%)	21.3	33.3	47.2	37.3	37.6
	% Sand (0.125mm - 0.063mm) (%)	18.9	6.32	9.38	13.7	15.4
	% Silt (0.063mm - 0.0312mm) (%)	13.8	2.43	5.85	6.80	6.57
	% Silt (0.0312mm - 0.004mm) (%)	25.1	2.13	9.70	9.52	8.33
	% Clay (<4um) (%)	16.3	2.23	7.45	7.67	8.23
	Texture	Loam	Sand	Loamy sand	Loamy sand	Loamy sand
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.83	0.49	0.79	0.53	0.64
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	7540	3770			
	% Saturation (%)	47.7	25.4			
	Sodium (Na) (mg/kg)	4220	2090			
Metals	Arsenic (As) (mg/kg)	7.77	2.42	5.29	5.73	6.32
	Cadmium (Cd) (mg/kg)	0.149	<0.050	0.133	0.148	0.240
	Chromium (Cr) (mg/kg)	21.3	14.3	16.6	15.0	13.2
	Copper (Cu) (mg/kg)	25.9	4.85	10.1	8.82	8.55
	Lead (Pb) (mg/kg)	8.42	1.99	4.07	2.97	2.79
	Mercury (Hg) (mg/kg)	0.0578	0.0077	0.0275	0.0157	0.0165
	Nickel (Ni) (mg/kg)	15.9	4.91	9.26	9.07	8.72
	Zinc (Zn) (mg/kg)	63.1	29.0	38.7	35.6	31.2
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Acenaphthylene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Anthracene (mg/kg)	0.0131	<0.0040	<0.0040	<0.0040	<0.0040
	Benz(a)anthracene (mg/kg)	0.024	<0.010	<0.010	<0.010	<0.010
	Benzo(a)pyrene (mg/kg)	0.020	<0.010	<0.010	<0.010	<0.010
	Benzo(b&j)fluoranthene (mg/kg)	0.042	<0.010	<0.010	<0.010	<0.010
	Benzo(g,h,i)perylene (mg/kg)	0.015	<0.010	<0.010	<0.010	<0.010
	Benzo(k)fluoranthene (mg/kg)	0.013	<0.010	<0.010	<0.010	<0.010
	Chrysene (mg/kg)	0.034	<0.010	<0.010	<0.010	<0.010
	Dibenz(a,h)anthracene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	Sample ID / Description / Sampled Date / Sampled Time / Client ID	L1731264-35 SEDIMENT 02-FEB-16 SPLIT 8 (1.5-2.0)	L1731264-36 SEDIMENT 02-FEB-16 SPLIT 8 (2.0-2.2)	L1731264-37 SEDIMENT 01-FEB-16 SPLIT 7 (0-0.2)	L1731264-38 SEDIMENT 01-FEB-16 SPLIT 7 (0.2-0.4)	L1731264-39 SEDIMENT 01-FEB-16 SPLIT 7 (0.4-0.6)
SOIL							
Physical Tests	% Moisture (%)		19.8	13.0	32.9	27.7	27.7
	Moisture (%)						
Particle Size	% Gravel (>2mm) (%)		5.84	13.1	0.16	<0.10	0.24
	% Sand (2.00mm - 1.00mm) (%)		5.60	6.95	1.17	0.72	1.24
	% Sand (1.00mm - 0.50mm) (%)		7.63	9.01	1.85	1.51	2.55
	% Sand (0.50mm - 0.25mm) (%)		8.55	11.1	4.97	5.33	6.58
	% Sand (0.25mm - 0.125mm) (%)		37.3	14.3	25.4	28.0	28.5
	% Sand (0.125mm - 0.063mm) (%)		15.6	13.3	10.8	10.3	10.3
	% Silt (0.063mm - 0.0312mm) (%)		6.42	10.8	11.8	11.6	11.1
	% Silt (0.0312mm - 0.004mm) (%)		6.60	13.6	25.4	24.0	23.0
	% Clay (<4um) (%)		6.45	7.87	18.5	18.6	16.6
	Texture		Loamy sand	Sandy loam	Loam	Loam	Loam
Organic / Inorganic Carbon	Total Organic Carbon (%)				1.54	1.15	0.98
Saturated Paste Extractables	Chloride (Cl) (mg/kg)						
	% Saturation (%)						
	Sodium (Na) (mg/kg)						
Metals	Arsenic (As) (mg/kg)						
	Cadmium (Cd) (mg/kg)						
	Chromium (Cr) (mg/kg)						
	Copper (Cu) (mg/kg)						
	Lead (Pb) (mg/kg)						
	Mercury (Hg) (mg/kg)						
	Nickel (Ni) (mg/kg)						
	Zinc (Zn) (mg/kg)						
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)						
	Acenaphthylene (mg/kg)						
	Anthracene (mg/kg)						
	Benz(a)anthracene (mg/kg)						
	Benzo(a)pyrene (mg/kg)						
	Benzo(b&j)fluoranthene (mg/kg)						
	Benzo(g,h,i)perylene (mg/kg)						
	Benzo(k)fluoranthene (mg/kg)						
	Chrysene (mg/kg)						
	Dibenz(a,h)anthracene (mg/kg)						

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731264-40	L1731264-41			
	Description	SEDIMENT	SEDIMENT			
	Sampled Date	01-FEB-16	01-FEB-16			
	Sampled Time					
	Client ID	SPLIT 7 (06.-0.8)	SPLIT 7 (0.8-1.06)			
Grouping	**Analyte**					
SOIL						
Physical Tests	% Moisture (%)	24.3	23.3			
	Moisture (%)					
Particle Size	% Gravel (>2mm) (%)	0.59	7.18			
	% Sand (2.00mm - 1.00mm) (%)	1.90	3.65			
	% Sand (1.00mm - 0.50mm) (%)	4.34	5.90			
	% Sand (0.50mm - 0.25mm) (%)	10.1	10.7			
	% Sand (0.25mm - 0.125mm) (%)	37.3	31.0			
	% Sand (0.125mm - 0.063mm) (%)	10.0	10.2			
	% Silt (0.063mm - 0.0312mm) (%)	8.31	7.78			
	% Silt (0.0312mm - 0.004mm) (%)	15.2	12.8			
	% Clay (<4um) (%)	12.3	10.8			
	Texture	Sandy loam	Sandy loam			
Organic / Inorganic Carbon	Total Organic Carbon (%)	0.80	0.77			
Saturated Paste Extractables	Chloride (Cl) (mg/kg)					
	% Saturation (%)					
	Sodium (Na) (mg/kg)					
Metals	Arsenic (As) (mg/kg)					
	Cadmium (Cd) (mg/kg)					
	Chromium (Cr) (mg/kg)					
	Copper (Cu) (mg/kg)					
	Lead (Pb) (mg/kg)					
	Mercury (Hg) (mg/kg)					
	Nickel (Ni) (mg/kg)					
	Zinc (Zn) (mg/kg)					
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)					
	Acenaphthylene (mg/kg)					
	Anthracene (mg/kg)					
	Benz(a)anthracene (mg/kg)					
	Benzo(a)pyrene (mg/kg)					
	Benzo(b&j)fluoranthene (mg/kg)					
	Benzo(g,h,i)perylene (mg/kg)					
	Benzo(k)fluoranthene (mg/kg)					
	Chrysene (mg/kg)					
	Dibenz(a,h)anthracene (mg/kg)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1731264-1	L1731264-2	L1731264-3	L1731264-4	L1731264-5
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	01-FEB-16	01-FEB-16	01-FEB-16	01-FEB-16	01-FEB-16
Sampled Time	13:26	13:31	13:35	13:40	13:46
Client ID	PCS08 (0-0.2)	PCS08 (0.2.-0.4)	PCS08 (0.4-0.6)	PCS08 (0.6-0.8)	PCS08 (0.8-1.06)
Grouping / **Analyte**					
SOIL					
Polycyclic Fluoranthene (mg/kg)					
Fluorene (mg/kg)					
Indeno(1,2,3-c,d)pyrene (mg/kg)					
Naphthalene (mg/kg)					
Phenanthrene (mg/kg)					
Pyrene (mg/kg)					
Surrogate: d10-Acenaphthene (%)					
Surrogate: d12-Chrysene (%)					
Surrogate: d10-Phenanthrene (%)					
Total PAHs (mg/kg)					
Polychlorinated Biphenyls PCB-1016 (mg/kg)					
PCB-1221 (mg/kg)					
PCB-1232 (mg/kg)					
PCB-1242 (mg/kg)					
PCB-1248 (mg/kg)					
PCB-1254 (mg/kg)					
PCB-1260 (mg/kg)					
PCB-1262 (mg/kg)					
PCB-1268 (mg/kg)					
Total PCB (BC CSR) (mg/kg)					
Total Polychlorinated Biphenyls (mg/kg)					
Dioxins and Furans WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)	1.051706	0.314819	0.1179634	0.0840748	0.0821314
WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)	1.027956	0.210969	0.0713684	0.0448848	0.0411864
WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)	0.621756	0.076319	0.0028734	0.0048677	0.0000777
TEF Reference	World Health Organization 1998	World Health Organization 1998	World Health Organization 1998	World Health Organization 1998	World Health Organization 1998
TEF Species	Fish	Fish	Fish	Fish	Fish
2,3,7,8-TCDD (pg/g)	0.225 [J]	<0.058 [U]	<0.034 [U]	<0.023 [U]	<0.034 [U]
1,2,3,7,8-PeCDD (pg/g)	0.270 M,J,R	<0.055 [U]	<0.033 [U]	<0.021 [U]	<0.019 [U]
1,2,3,4,7,8-HxCDD (pg/g)	<0.083 [U]	<0.14 [U]	<0.030 [U]	<0.041 [U]	<0.027 [U]
1,2,3,6,7,8-HxCDD (pg/g)	3.34 [J]	0.40 M,J,R	0.120 M,J	<0.040 M,U	<0.026 [U]
1,2,3,7,8,9-HxCDD (pg/g)	1.39 [J]	0.30 [J]	<0.030 [U]	<0.040 M,U	<0.026 [U]
1,2,3,4,6,7,8-HpCDD (pg/g)	8.46	1.78 [J]	0.340 [J]	0.130 J,R	0.052 M,J
OCDD (pg/g)	42.4	11.9	1.81 [J]	0.727 [J]	0.257 M,J
Total-TCDD (pg/g)	0.377	<0.058 [U]	0.041	<0.023 [U]	<0.034 [U]

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731264-6	L1731264-7	L1731264-8	L1731264-9	L1731264-10
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	01-FEB-16	01-FEB-16	01-FEB-16	02-FEB-16	02-FEB-16
	Sampled Time	14:01	14:08	14:11	10:37	10:42
	Client ID	PCL08 (0-0.5)	PCL08 (0.5-1.0)	PCL08 (1.0-1.3)	PCL29 (0-0.5)	PCL29 (0.5-1.0)
Grouping	**Analyte**					
SOIL						
Polycyclic	Fluoranthene (mg/kg)	0.021	<0.010	<0.010	0.064	<0.010
	Fluorene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.010	<0.010	<0.010	0.011	<0.010
	Naphthalene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Phenanthrene (mg/kg)	0.016	<0.010	<0.010	0.036	<0.010
	Pyrene (mg/kg)	0.017	<0.010	<0.010	0.053	<0.010
	Surrogate: d10-Acenaphthene (%)	99.9	82.0	67.9	84.1	78.4
	Surrogate: d12-Chrysene (%)	106.8	78.9	60.4	77.6	70.9
	Surrogate: d10-Phenanthrene (%)	98.9	80.5	64.1	82.4	76.1
	Total PAHs (mg/kg)	0.080	<0.035	<0.035	0.282	<0.035
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1221 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1232 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1242 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1248 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1254 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1260 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1262 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1268 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Total PCB (BC CSR) (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Total Polychlorinated Biphenyls (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)					
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)					
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)					
	TEF Reference					
	TEF Species					
	2,3,7,8-TCDD (pg/g)					
	1,2,3,7,8-PeCDD (pg/g)					
	1,2,3,4,7,8-HxCDD (pg/g)					
	1,2,3,6,7,8-HxCDD (pg/g)					
	1,2,3,7,8,9-HxCDD (pg/g)					
	1,2,3,4,6,7,8-HpCDD (pg/g)					
	OCDD (pg/g)					
	Total-TCDD (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731264-11	L1731264-12	L1731264-13	L1731264-14	L1731264-15
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16
	Sampled Time	10:46	10:55	10:59	12:04	12:05
	Client ID	PCL29 (1.0-1.5)	PCL29 (1.5-2.0)	PCL29 (2.0-2.34)	PCS32 (0-0.2)	PCS32 (0.2-0.4)
Grouping	**Analyte**					
SOIL						
Polycyclic	Fluoranthene (mg/kg)	<0.010				
	Fluorene (mg/kg)	<0.010				
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.010				
	Naphthalene (mg/kg)	<0.010				
	Phenanthrene (mg/kg)	<0.010				
	Pyrene (mg/kg)	<0.010				
	Surrogate: d10-Acenaphthene (%)	78.1				
	Surrogate: d12-Chrysene (%)	70.8				
	Surrogate: d10-Phenanthrene (%)	73.9				
	Total PAHs (mg/kg)	<0.035				
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020				
	PCB-1221 (mg/kg)	<0.020				
	PCB-1232 (mg/kg)	<0.020				
	PCB-1242 (mg/kg)	<0.020				
	PCB-1248 (mg/kg)	<0.020				
	PCB-1254 (mg/kg)	<0.020				
	PCB-1260 (mg/kg)	<0.020				
	PCB-1262 (mg/kg)	<0.020				
	PCB-1268 (mg/kg)	<0.020				
	Total PCB (BC CSR) (mg/kg)	<0.020				
	Total Polychlorinated Biphenyls (mg/kg)	<0.020				
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)				0.604617	0.1491167
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)				0.523557	0.1013567
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)				0.230697	0.0357467
	TEF Reference				World Health Organization 1998	World Health Organization 1998
	TEF Species				Fish	Fish
	2,3,7,8-TCDD (pg/g)				<0.072 [U]	<0.031 [U]
	1,2,3,7,8-PeCDD (pg/g)				0.140 J,R	<0.032 M,U
	1,2,3,4,7,8-HxCDD (pg/g)				<0.14 [U]	<0.040 [U]
	1,2,3,6,7,8-HxCDD (pg/g)				1.87 M,J	0.355 [J]
	1,2,3,7,8,9-HxCDD (pg/g)				0.83 [J]	0.140 J,R
	1,2,3,4,6,7,8-HpCDD (pg/g)				4.95	0.900 J,R
	OCDD (pg/g)				25.9	5.58 [J]
	Total-TCDD (pg/g)				<0.072 [U]	0.183

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731264-16	L1731264-17	L1731264-18	L1731264-23	L1731264-24
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16
	Sampled Time	12:09	12:11	12:15	13:46	13:50
	Client ID	PCS32 (0.4-0.6)	PCS32 (0.6-0.8)	PCS32 (0.8-1.0)	PCL23 (0-0.5)	PCL23 (0.5-1.0)
Grouping	**Analyte**					
SOIL						
Polycyclic	Fluoranthene (mg/kg)				<0.010	<0.010
	Fluorene (mg/kg)				<0.010	<0.010
	Indeno(1,2,3-c,d)pyrene (mg/kg)				<0.010	<0.010
	Naphthalene (mg/kg)				<0.010	<0.010
	Phenanthrene (mg/kg)				<0.010	<0.010
	Pyrene (mg/kg)				<0.010	<0.010
	Surrogate: d10-Acenaphthene (%)				78.0	77.4
	Surrogate: d12-Chrysene (%)				73.7	80.5
	Surrogate: d10-Phenanthrene (%)				76.6	76.9
	Total PAHs (mg/kg)				<0.035	<0.035
Polychlorinated Biphenyls	PCB-1016 (mg/kg)				<0.020	<0.020
	PCB-1221 (mg/kg)				<0.020	<0.020
	PCB-1232 (mg/kg)				<0.020	<0.020
	PCB-1242 (mg/kg)				<0.020	<0.020
	PCB-1248 (mg/kg)				<0.020	<0.020
	PCB-1254 (mg/kg)				<0.020	<0.020
	PCB-1260 (mg/kg)				<0.020	<0.020
	PCB-1262 (mg/kg)				<0.020	<0.020
	PCB-1268 (mg/kg)				<0.020	<0.020
	Total PCB (BC CSR) (mg/kg)				<0.020	<0.020
	Total Polychlorinated Biphenyls (mg/kg)				<0.020	<0.020
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)	0.11100711	0.1009329	0.0958166		
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)	0.05814711	0.05220895	0.0531298		
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)	0.00411011	0.002414	0.010183		
	TEF Reference	World Health Organization 1998	World Health Organization 1998	World Health Organization 1998		
	TEF Species	Fish	Fish	Fish		
	2,3,7,8-TCDD (pg/g)	<0.026 [U]	<0.037 [U]	<0.032 [U]		
	1,2,3,7,8-PeCDD (pg/g)	<0.042 [U]	<0.025 [U]	<0.025 [U]		
	1,2,3,4,7,8-HxCDD (pg/g)	<0.037 [U]	<0.036 [U]	<0.036 [U]		
	1,2,3,6,7,8-HxCDD (pg/g)	<0.035 [M,U]	<0.034 [U]	<0.032 [U]		
	1,2,3,7,8,9-HxCDD (pg/g)	<0.036 [U]	<0.035 [U]	<0.033 [U]		
	1,2,3,4,6,7,8-HpCDD (pg/g)	0.087 [J,R]	<0.034 [M,U]	0.048 [M,J]		
	OCDD (pg/g)	0.602 [J]	0.210 [M,J,R]	0.198 [M,J]		
	Total-TCDD (pg/g)	<0.026 [U]	<0.037 [U]	<0.032 [U]		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731264-25	L1731264-26	L1731264-27	L1731264-28	L1731264-29
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16
	Sampled Time	13:54	14:00	14:04	14:50	15:00
	Client ID	PCL23 (1.0-1.5)	PCL23 (1.5-2.0)	PCL23 (2.0-2.2)	SS12 (0-0.075)	SS14 (0-0.075)
Grouping	**Analyte**					
SOIL						
Polycyclic	Fluoranthene (mg/kg)	<0.010			0.090	0.040
	Fluorene (mg/kg)	<0.010			0.012	<0.010
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.010			0.020	<0.010
	Naphthalene (mg/kg)	<0.010			0.016	<0.010
	Phenanthrene (mg/kg)	<0.010			0.064	0.018
	Pyrene (mg/kg)	<0.010			0.078	0.032
	Surrogate: d10-Acenaphthene (%)	83.4			99.9	83.2
	Surrogate: d12-Chrysene (%)	84.8			99.2	78.3
	Surrogate: d10-Phenanthrene (%)	82.0			98.6	81.0
	Total PAHs (mg/kg)	<0.035			0.537	0.152
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020			<0.020	<0.020
	PCB-1221 (mg/kg)	<0.020			<0.020	<0.020
	PCB-1232 (mg/kg)	<0.020			<0.020	<0.020
	PCB-1242 (mg/kg)	<0.020			<0.020	<0.020
	PCB-1248 (mg/kg)	<0.020			<0.020	<0.020
	PCB-1254 (mg/kg)	<0.020			<0.020	<0.020
	PCB-1260 (mg/kg)	<0.020			<0.020	<0.020
	PCB-1262 (mg/kg)	<0.020			<0.020	<0.020
	PCB-1268 (mg/kg)	<0.020			<0.020	<0.020
	Total PCB (BC CSR) (mg/kg)	<0.020			<0.020	<0.020
	Total Polychlorinated Biphenyls (mg/kg)	<0.020			<0.020	<0.020
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)					
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)					
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)					
	TEF Reference					
	TEF Species					
	2,3,7,8-TCDD (pg/g)					
	1,2,3,7,8-PeCDD (pg/g)					
	1,2,3,4,7,8-HxCDD (pg/g)					
	1,2,3,6,7,8-HxCDD (pg/g)					
	1,2,3,7,8,9-HxCDD (pg/g)					
	1,2,3,4,6,7,8-HpCDD (pg/g)					
	OCDD (pg/g)					
	Total-TCDD (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1731264-30 SEDIMENT 02-FEB-16 15:25 SS16 (0-0.075)	L1731264-31 SEDIMENT 02-FEB-16 15:49 SS18 (0-0.075)	L1731264-32 SEDIMENT 02-FEB-16 SPLIT 8 (0-0.5)	L1731264-33 SEDIMENT 02-FEB-16 SPLIT 8 (0.5-1.0)	L1731264-34 SEDIMENT 02-FEB-16 SPLIT 8 (1.0-1.5)
SOIL						
Polycyclic	Fluoranthene (mg/kg)	0.058	<0.010	<0.010	<0.010	<0.010
	Fluorene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Indeno(1,2,3-c,d)pyrene (mg/kg)	0.011	<0.010	<0.010	<0.010	<0.010
	Naphthalene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Phenanthrene (mg/kg)	0.028	<0.010	<0.010	<0.010	<0.010
	Pyrene (mg/kg)	0.055	<0.010	<0.010	<0.010	<0.010
	Surrogate: d10-Acenaphthene (%)	87.8	79.2	83.5	100.8	91.6
	Surrogate: d12-Chrysene (%)	83.2	77.6	87.0	102.2	93.1
	Surrogate: d10-Phenanthrene (%)	86.0	76.6	82.0	97.4	87.1
	Total PAHs (mg/kg)	0.270	<0.035	<0.035	<0.035	<0.035
Polychlorinated Biphenyls	PCB-1016 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1221 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1232 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1242 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1248 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1254 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1260 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1262 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	PCB-1268 (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Total PCB (BC CSR) (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Total Polychlorinated Biphenyls (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)					
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)					
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)					
	TEF Reference					
	TEF Species					
	2,3,7,8-TCDD (pg/g)					
	1,2,3,7,8-PeCDD (pg/g)					
	1,2,3,4,7,8-HxCDD (pg/g)					
	1,2,3,6,7,8-HxCDD (pg/g)					
	1,2,3,7,8,9-HxCDD (pg/g)					
	1,2,3,4,6,7,8-HpCDD (pg/g)					
	OCDD (pg/g)					
	Total-TCDD (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1731264-35 SEDIMENT 02-FEB-16 SPLIT 8 (1.5-2.0)	L1731264-36 SEDIMENT 02-FEB-16 SPLIT 8 (2.0-2.2)	L1731264-37 SEDIMENT 01-FEB-16 SPLIT 7 (0-0.2)	L1731264-38 SEDIMENT 01-FEB-16 SPLIT 7 (0.2-0.4)	L1731264-39 SEDIMENT 01-FEB-16 SPLIT 7 (0.4-0.6)
SOIL						
Polycyclic	Fluoranthene (mg/kg)					
	Fluorene (mg/kg)					
	Indeno(1,2,3-c,d)pyrene (mg/kg)					
	Naphthalene (mg/kg)					
	Phenanthrene (mg/kg)					
	Pyrene (mg/kg)					
	Surrogate: d10-Acenaphthene (%)					
	Surrogate: d12-Chrysene (%)					
	Surrogate: d10-Phenanthrene (%)					
	Total PAHs (mg/kg)					
Polychlorinated Biphenyls	PCB-1016 (mg/kg)					
	PCB-1221 (mg/kg)					
	PCB-1232 (mg/kg)					
	PCB-1242 (mg/kg)					
	PCB-1248 (mg/kg)					
	PCB-1254 (mg/kg)					
	PCB-1260 (mg/kg)					
	PCB-1262 (mg/kg)					
	PCB-1268 (mg/kg)					
	Total PCB (BC CSR) (mg/kg)					
	Total Polychlorinated Biphenyls (mg/kg)					
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)			1.04441	0.319857	0.1611468
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)			1.003825	0.258912	0.0885368
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)			0.40899	0.172617	0.0145768
	TEF Reference			World Health Organization 1998	World Health Organization 1998	World Health Organization 1998
	TEF Species			Fish	Fish	Fish
	2,3,7,8-TCDD (pg/g)			0.250 J,R	0.050 M,J	<0.040 [U]
	1,2,3,7,8-PeCDD (pg/g)			0.220 M,J,R	<0.059 [U]	<0.037 [U]
	1,2,3,4,7,8-HxCDD (pg/g)			<0.11 [U]	<0.075 [U]	<0.081 [U]
	1,2,3,6,7,8-HxCDD (pg/g)			3.41 [J]	0.670 [J]	<0.071 M,U
	1,2,3,7,8,9-HxCDD (pg/g)			1.46 [J]	0.416 M,J	<0.075 [U]
	1,2,3,4,6,7,8-HpCDD (pg/g)			7.13	2.53 [J]	0.210 M,J
	OCDD (pg/g)			36.0	14.0 [R]	1.36 M,J
	Total-TCDD (pg/g)			0.277	0.050	<0.040 [U]

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731264-40	L1731264-41			
	Description	SEDIMENT	SEDIMENT			
	Sampled Date	01-FEB-16	01-FEB-16			
	Sampled Time					
	Client ID	SPLIT 7 (06.-0.8)	SPLIT 7 (0.8-1.06)			
Grouping	**Analyte**					
SOIL						
Polycyclic	Fluoranthene (mg/kg)					
	Fluorene (mg/kg)					
	Indeno(1,2,3-c,d)pyrene (mg/kg)					
	Naphthalene (mg/kg)					
	Phenanthrene (mg/kg)					
	Pyrene (mg/kg)					
	Surrogate: d10-Acenaphthene (%)					
	Surrogate: d12-Chrysene (%)					
	Surrogate: d10-Phenanthrene (%)					
	Total PAHs (mg/kg)					
Polychlorinated Biphenyls	PCB-1016 (mg/kg)					
	PCB-1221 (mg/kg)					
	PCB-1232 (mg/kg)					
	PCB-1242 (mg/kg)					
	PCB-1248 (mg/kg)					
	PCB-1254 (mg/kg)					
	PCB-1260 (mg/kg)					
	PCB-1262 (mg/kg)					
	PCB-1268 (mg/kg)					
	Total PCB (BC CSR) (mg/kg)					
	Total Polychlorinated Biphenyls (mg/kg)					
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)	0.1325848	0.1805295			
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)	0.0678448	0.09033585			
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)	0.0000819	0.0000732			
	TEF Reference	World Health Organization 1998	World Health Organization 1998			
	TEF Species	Fish	Fish			
	2,3,7,8-TCDD (pg/g)	<0.033 [U]	<0.065 [U]			
	1,2,3,7,8-PeCDD (pg/g)	<0.041 [U]	<0.039 [U]			
	1,2,3,4,7,8-HxCDD (pg/g)	<0.064 [U]	<0.076 [U]			
	1,2,3,6,7,8-HxCDD (pg/g)	<0.061 M,U	<0.067 M,U			
	1,2,3,7,8,9-HxCDD (pg/g)	<0.062 [U]	<0.070 [U]			
	1,2,3,4,6,7,8-HpCDD (pg/g)	0.082 M,J	0.069 M,J,R			
	OCDD (pg/g)	0.490 M,J,R	0.732 M,J			
	Total-TCDD (pg/g)	<0.033 [U]	<0.065 [U]			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1731264-1	L1731264-2	L1731264-3	L1731264-4	L1731264-5
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	01-FEB-16	01-FEB-16	01-FEB-16	01-FEB-16	01-FEB-16
Sampled Time	13:26	13:31	13:35	13:40	13:46
Client ID	PCS08 (0-0.2)	PCS08 (0.2.-0.4)	PCS08 (0.4-0.6)	PCS08 (0.6-0.8)	PCS08 (0.8-1.06)
Grouping **Analyte**					
SOIL					
Dioxins and Furans Total TCDD # Homologues	2	0	1	0	0
Total-PeCDD (pg/g)	1.11	0.098	<0.033 [U]	<0.021 [U]	<0.019 [U]
Total PeCDD # Homologues	3	1	0	0	0
Total-HxCDD (pg/g)	26.3	0.30	0.819	<0.041 [U]	<0.027 [U]
Total HxCDD # Homologues	9	1	3	0	0
Total-HpCDD (pg/g)	20.9	4.83	0.685	<0.034 [U]	0.052
Total HpCDD # Homologues	2	2	2	0	1
2,3,7,8-TCDF (pg/g)	6.24 [M]	1.29	0.270 M,J,R	0.096 [J]	<0.022 M,J,R
1,2,3,7,8-PeCDF (pg/g)	0.134 [J]	0.046 M,J,R	0.018 M,J,R	<0.012 [U]	<0.014 M,U
2,3,4,7,8-PeCDF (pg/g)	0.180 M,J,R	0.049 M,J,R	0.015 M,J,R	<0.011 [U]	<0.013 [U]
1,2,3,4,7,8-HxCDF (pg/g)	0.091 [J]	<0.059 [U]	<0.026 [U]	<0.016 [U]	<0.015 [U]
1,2,3,6,7,8-HxCDF (pg/g)	0.058 M,J,R	<0.055 [U]	<0.025 [U]	<0.015 [U]	<0.015 [U]
1,2,3,7,8,9-HxCDF (pg/g)	<0.060 M,U	<0.073 [U]	<0.032 [U]	<0.020 M,U	<0.020 M,U
2,3,4,6,7,8-HxCDF (pg/g)	0.086 M,J	<0.054 M,U	<0.024 [U]	<0.015 [U]	<0.014 [U]
1,2,3,4,6,7,8-HpCDF (pg/g)	1.60 J,R	0.578 [J]	0.113 [J]	0.069 J,R	0.016 M,J,R
1,2,3,4,7,8,9-HpCDF (pg/g)	0.065 M,J,R	<0.060 M,U	<0.019 [U]	<0.038 [U]	<0.017 M,U
OCDF (pg/g)	3.86 [J]	1.09 M,J	0.224 [J]	0.071 M,J,R	0.037 M,J,R
Total-TCDF (pg/g)	11.8	1.38	0.126	0.401	0.211
Total TCDF # Homologues	11	2	1	2	1
Total-PeCDF (pg/g)	0.611	<0.032 [U]	<0.015 [U]	<0.012 [U]	<0.014 [U]
Total PeCDF # Homologues	5	0	0	0	0
Total-HxCDF (pg/g)	2.50	0.338	0.124	0.026	<0.020 [U]
Total HxCDF # Homologues	5	1	2	1	0
Total-HpCDF (pg/g)	3.19	1.40	0.330	0.078	<0.017 [U]
Total HpCDF # Homologues	1	2	2	1	0
Surrogate: 13C12-2,3,7,8-TCDD (%)	73.0	63.0	122.0	72.0	73.0
Surrogate: 13C12-1,2,3,7,8-PeCDD (%)	66.0	56.0	115.0	66.0	68.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)	87.0	74.0	81.0	91.0	85.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)	87.0	79.0	86.0	87.0	96.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)	79.0	75.0	81.0	85.0	85.0
Surrogate: 13C12-OCDD (%)	77.0	72.0	73.0	72.0	80.0
Surrogate: 13C12-2,3,7,8-TCDF (%)	73.0	63.0	124.0	71.0	73.0
Surrogate: 13C12-1,2,3,7,8-PeCDF (%)	67.0	57.0	116.0	67.0	69.0
Surrogate: 13C12-2,3,4,7,8-PeCDF (%)	66.0	57.0	113.0	66.0	68.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)	86.0	74.0	82.0	88.0	87.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)	85.0	78.0	82.0	92.0	90.0
Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)	88.0	78.0	83.0	90.0	91.0

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731264-6	L1731264-7	L1731264-8	L1731264-9	L1731264-10
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	01-FEB-16	01-FEB-16	01-FEB-16	02-FEB-16	02-FEB-16
	Sampled Time	14:01	14:08	14:11	10:37	10:42
	Client ID	PCL08 (0-0.5)	PCL08 (0.5-1.0)	PCL08 (1.0-1.3)	PCL29 (0-0.5)	PCL29 (0.5-1.0)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total TCDD # Homologues					
	Total-PeCDD (pg/g)					
	Total PeCDD # Homologues					
	Total-HxCDD (pg/g)					
	Total HxCDD # Homologues					
	Total-HpCDD (pg/g)					
	Total HpCDD # Homologues					
	2,3,7,8-TCDF (pg/g)					
	1,2,3,7,8-PeCDF (pg/g)					
	2,3,4,7,8-PeCDF (pg/g)					
	1,2,3,4,7,8-HxCDF (pg/g)					
	1,2,3,6,7,8-HxCDF (pg/g)					
	1,2,3,7,8,9-HxCDF (pg/g)					
	2,3,4,6,7,8-HxCDF (pg/g)					
	1,2,3,4,6,7,8-HpCDF (pg/g)					
	1,2,3,4,7,8,9-HpCDF (pg/g)					
	OCDF (pg/g)					
	Total-TCDF (pg/g)					
	Total TCDF # Homologues					
	Total-PeCDF (pg/g)					
	Total PeCDF # Homologues					
	Total-HxCDF (pg/g)					
	Total HxCDF # Homologues					
	Total-HpCDF (pg/g)					
	Total HpCDF # Homologues					
	Surrogate: 13C12-2,3,7,8-TCDD (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)					
	Surrogate: 13C12-OCDD (%)					
	Surrogate: 13C12-2,3,7,8-TCDF (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)					
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)					
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1731264-11	L1731264-12	L1731264-13	L1731264-14	L1731264-15
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16
Sampled Time	10:46	10:55	10:59	12:04	12:05
Client ID	PCL29 (1.0-1.5)	PCL29 (1.5-2.0)	PCL29 (2.0-2.34)	PCS32 (0-0.2)	PCS32 (0.2-0.4)
Grouping **Analyte**					
SOIL					
Dioxins and Furans Total TCDD # Homologues				0	2
Total-PeCDD (pg/g)				0.122	<0.032 [U]
Total PeCDD # Homologues				1	0
Total-HxCDD (pg/g)				15.0	2.34
Total HxCDD # Homologues				5	3
Total-HpCDD (pg/g)				11.1	1.29
Total HpCDD # Homologues				2	1
2,3,7,8-TCDF (pg/g)				3.60 [M]	0.588 M,J
1,2,3,7,8-PeCDF (pg/g)				0.071 M,J	0.031 M,J,R
2,3,4,7,8-PeCDF (pg/g)				0.130 J,R	0.028 J,R
1,2,3,4,7,8-HxCDF (pg/g)				<0.059 [U]	<0.030 [U]
1,2,3,6,7,8-HxCDF (pg/g)				<0.056 [U]	<0.028 [U]
1,2,3,7,8,9-HxCDF (pg/g)				<0.079 [U]	<0.037 [U]
2,3,4,6,7,8-HxCDF (pg/g)				0.068 M,J,R	<0.028 [U]
1,2,3,4,6,7,8-HpCDF (pg/g)				1.24 [J]	0.219 [J]
1,2,3,4,7,8,9-HpCDF (pg/g)				<0.072 M,U	<0.022 [U]
OCDF (pg/g)				2.22 M,J	0.487 [J]
Total-TCDF (pg/g)				6.94	1.21
Total TCDF # Homologues				6	3
Total-PeCDF (pg/g)				0.774	0.066
Total PeCDF # Homologues				3	1
Total-HxCDF (pg/g)				0.777	<0.037 [U]
Total HxCDF # Homologues				1	0
Total-HpCDF (pg/g)				3.13	0.601
Total HpCDF # Homologues				2	2
Surrogate: 13C12-2,3,7,8-TCDD (%)				70.0	69.0
Surrogate: 13C12-1,2,3,7,8-PeCDD (%)				66.0	63.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)				72.0	78.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)				88.0	87.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)				81.0	82.0
Surrogate: 13C12-OCDD (%)				77.0	73.0
Surrogate: 13C12-2,3,7,8-TCDF (%)				70.0	68.0
Surrogate: 13C12-1,2,3,7,8-PeCDF (%)				66.0	65.0
Surrogate: 13C12-2,3,4,7,8-PeCDF (%)				65.0	65.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)				74.0	77.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)				82.0	84.0
Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)				80.0	84.0

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731264-16	L1731264-17	L1731264-18	L1731264-23	L1731264-24
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16
	Sampled Time	12:09	12:11	12:15	13:46	13:50
	Client ID	PCS32 (0.4-0.6)	PCS32 (0.6-0.8)	PCS32 (0.8-1.0)	PCL23 (0-0.5)	PCL23 (0.5-1.0)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total TCDD # Homologues	0	0	0		
	Total-PeCDD (pg/g)	<0.042 [U]	<0.025 [U]	<0.025 [U]		
	Total PeCDD # Homologues	0	0	0		
	Total-HxCDD (pg/g)	0.050	<0.036 [U]	<0.036 [U]		
	Total HxCDD # Homologues	1	0	0		
	Total-HpCDD (pg/g)	<0.025 [U]	<0.034 [U]	0.048		
	Total HpCDD # Homologues	0	0	1		
	2,3,7,8-TCDF (pg/g)	0.081 [J]	0.038 M,J	<0.026 M,U		
	1,2,3,7,8-PeCDF (pg/g)	0.016 M,J,R	0.021 M,J,R	0.028 M,J		
	2,3,4,7,8-PeCDF (pg/g)	<0.013 M,U	<0.015 [U]	0.017 M,J		
	1,2,3,4,7,8-HxCDF (pg/g)	<0.028 [U]	<0.022 [U]	<0.020 [U]		
	1,2,3,6,7,8-HxCDF (pg/g)	<0.027 [U]	<0.020 [U]	<0.018 [U]		
	1,2,3,7,8,9-HxCDF (pg/g)	<0.036 M,U	<0.028 M,U	<0.025 [U]		
	2,3,4,6,7,8-HxCDF (pg/g)	<0.027 [U]	<0.020 [U]	<0.019 M,U		
	1,2,3,4,6,7,8-HpCDF (pg/g)	0.029 M,J,R	0.051 M,J	0.026 M,J,R		
	1,2,3,4,7,8,9-HpCDF (pg/g)	<0.021 [U]	<0.022 [U]	<0.022 [U]		
	OCDF (pg/g)	0.049 M,J	<0.039 M,U	<0.036 [U]		
	Total-TCDF (pg/g)	0.353	0.038	<0.026 [U]		
	Total TCDF # Homologues	2	1	0		
	Total-PeCDF (pg/g)	<0.014 [U]	<0.017 [U]	0.045		
	Total PeCDF # Homologues	0	0	2		
	Total-HxCDF (pg/g)	<0.036 [U]	<0.028 [U]	<0.025 [U]		
	Total HxCDF # Homologues	0	0	0		
	Total-HpCDF (pg/g)	0.022	0.051	<0.022 [U]		
	Total HpCDF # Homologues	1	1	0		
	Surrogate: 13C12-2,3,7,8-TCDD (%)	68.0	66.0	71.0		
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)	63.0	64.0	64.0		
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)	76.0	74.0	80.0		
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)	87.0	88.0	91.0		
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)	77.0	79.0	80.0		
	Surrogate: 13C12-OCDD (%)	65.0	67.0	69.0		
	Surrogate: 13C12-2,3,7,8-TCDF (%)	67.0	66.0	71.0		
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)	63.0	62.0	63.0		
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)	62.0	62.0	63.0		
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)	78.0	75.0	80.0		
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)	84.0	84.0	89.0		
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)	81.0	81.0	86.0		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1731264-25	L1731264-26	L1731264-27	L1731264-28	L1731264-29
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16
Sampled Time	13:54	14:00	14:04	14:50	15:00
Client ID	PCL23 (1.0-1.5)	PCL23 (1.5-2.0)	PCL23 (2.0-2.2)	SS12 (0-0.075)	SS14 (0-0.075)
Grouping / **Analyte**					
SOIL					
Dioxins and Furans					
Total TCDD # Homologues					
Total-PeCDD (pg/g)					
Total PeCDD # Homologues					
Total-HxCDD (pg/g)					
Total HxCDD # Homologues					
Total-HpCDD (pg/g)					
Total HpCDD # Homologues					
2,3,7,8-TCDF (pg/g)					
1,2,3,7,8-PeCDF (pg/g)					
2,3,4,7,8-PeCDF (pg/g)					
1,2,3,4,7,8-HxCDF (pg/g)					
1,2,3,6,7,8-HxCDF (pg/g)					
1,2,3,7,8,9-HxCDF (pg/g)					
2,3,4,6,7,8-HxCDF (pg/g)					
1,2,3,4,6,7,8-HpCDF (pg/g)					
1,2,3,4,7,8,9-HpCDF (pg/g)					
OCDF (pg/g)					
Total-TCDF (pg/g)					
Total TCDF # Homologues					
Total-PeCDF (pg/g)					
Total PeCDF # Homologues					
Total-HxCDF (pg/g)					
Total HxCDF # Homologues					
Total-HpCDF (pg/g)					
Total HpCDF # Homologues					
Surrogate: 13C12-2,3,7,8-TCDD (%)					
Surrogate: 13C12-1,2,3,7,8-PeCDD (%)					
Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)					
Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)					
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)					
Surrogate: 13C12-OCDD (%)					
Surrogate: 13C12-2,3,7,8-TCDF (%)					
Surrogate: 13C12-1,2,3,7,8-PeCDF (%)					
Surrogate: 13C12-2,3,4,7,8-PeCDF (%)					
Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)					
Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)					
Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731264-30	L1731264-31	L1731264-32	L1731264-33	L1731264-34
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16
	Sampled Time	15:25	15:49			
	Client ID	SS16 (0-0.075)	SS18 (0-0.075)	SPLIT 8 (0-0.5)	SPLIT 8 (0.5-1.0)	SPLIT 8 (1.0-1.5)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total TCDD # Homologues					
	Total-PeCDD (pg/g)					
	Total PeCDD # Homologues					
	Total-HxCDD (pg/g)					
	Total HxCDD # Homologues					
	Total-HpCDD (pg/g)					
	Total HpCDD # Homologues					
	2,3,7,8-TCDF (pg/g)					
	1,2,3,7,8-PeCDF (pg/g)					
	2,3,4,7,8-PeCDF (pg/g)					
	1,2,3,4,7,8-HxCDF (pg/g)					
	1,2,3,6,7,8-HxCDF (pg/g)					
	1,2,3,7,8,9-HxCDF (pg/g)					
	2,3,4,6,7,8-HxCDF (pg/g)					
	1,2,3,4,6,7,8-HpCDF (pg/g)					
	1,2,3,4,7,8,9-HpCDF (pg/g)					
	OCDF (pg/g)					
	Total-TCDF (pg/g)					
	Total TCDF # Homologues					
	Total-PeCDF (pg/g)					
	Total PeCDF # Homologues					
	Total-HxCDF (pg/g)					
	Total HxCDF # Homologues					
	Total-HpCDF (pg/g)					
	Total HpCDF # Homologues					
	Surrogate: 13C12-2,3,7,8-TCDD (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)					
	Surrogate: 13C12-OCDD (%)					
	Surrogate: 13C12-2,3,7,8-TCDF (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)					
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)					
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1731264-35	L1731264-36	L1731264-37	L1731264-38	L1731264-39
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	02-FEB-16	02-FEB-16	01-FEB-16	01-FEB-16	01-FEB-16
Sampled Time					
Client ID	SPLIT 8 (1.5-2.0)	SPLIT 8 (2.0-2.2)	SPLIT 7 (0-0.2)	SPLIT 7 (0.2-0.4)	SPLIT 7 (0.4-0.6)
Grouping / **Analyte**					
SOIL					
Dioxins and Furans					
Total TCDD # Homologues			2	1	0
Total-PeCDD (pg/g)			1.41	0.272	0.074
Total PeCDD # Homologues			5	2	1
Total-HxCDD (pg/g)			26.1	5.99	<0.081 [U]
Total HxCDD # Homologues			4	5	0
Total-HpCDD (pg/g)			16.6	6.56	0.210
Total HpCDD # Homologues			2	2	1
2,3,7,8-TCDF (pg/g)			6.69 [M]	2.03 [M]	0.268 M,J
1,2,3,7,8-PeCDF (pg/g)			0.085 J,R	0.037 M,J,R	0.027 M,J,R
2,3,4,7,8-PeCDF (pg/g)			0.160 J,R	0.047 M,J,R	<0.022 [U]
1,2,3,4,7,8-HxCDF (pg/g)			<0.059 M,U	<0.058 M,U	<0.034 [U]
1,2,3,6,7,8-HxCDF (pg/g)			<0.055 M,J,R	<0.056 [U]	<0.034 [U]
1,2,3,7,8,9-HxCDF (pg/g)			<0.081 [U]	<0.080 M,U	<0.048 M,U
2,3,4,6,7,8-HxCDF (pg/g)			<0.058 M,U	<0.054 M,U	<0.033 [U]
1,2,3,4,6,7,8-HpCDF (pg/g)			1.47 [J]	0.670 [J]	0.081 M,J
1,2,3,4,7,8,9-HpCDF (pg/g)			<0.087 [U]	<0.059 [U]	<0.036 [U]
OCDF (pg/g)			3.60 [J]	1.27 [J]	0.168 [J]
Total-TCDF (pg/g)			13.7	4.02	0.762
Total TCDF # Homologues			12	6	3
Total-PeCDF (pg/g)			0.593	0.128	<0.024 [U]
Total PeCDF # Homologues			4	1	0
Total-HxCDF (pg/g)			2.02	0.557	<0.048 [U]
Total HxCDF # Homologues			2	1	0
Total-HpCDF (pg/g)			4.46	1.82	0.231
Total HpCDF # Homologues			2	2	2
Surrogate: 13C12-2,3,7,8-TCDD (%)			73.0	67.0	68.0
Surrogate: 13C12-1,2,3,7,8-PeCDD (%)			66.0	62.0	61.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)			76.0	72.0	71.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)			94.0	88.0	86.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)			82.0	75.0	73.0
Surrogate: 13C12-OCDD (%)			77.0	64.0	59.0
Surrogate: 13C12-2,3,7,8-TCDF (%)			73.0	66.0	68.0
Surrogate: 13C12-1,2,3,7,8-PeCDF (%)			67.0	63.0	63.0
Surrogate: 13C12-2,3,4,7,8-PeCDF (%)			67.0	62.0	61.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)			80.0	76.0	74.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)			90.0	83.0	82.0
Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)			84.0	84.0	79.0

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731264-40	L1731264-41			
	Description	SEDIMENT	SEDIMENT			
	Sampled Date	01-FEB-16	01-FEB-16			
	Sampled Time					
	Client ID	SPLIT 7 (06.-0.8)	SPLIT 7 (0.8-1.06)			
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total TCDD # Homologues	0	0			
	Total-PeCDD (pg/g)	<0.041 [U]	<0.039 [U]			
	Total PeCDD # Homologues	0	0			
	Total-HxCDD (pg/g)	<0.064 [U]	<0.076 [U]			
	Total HxCDD # Homologues	0	0			
	Total-HpCDD (pg/g)	0.220	0.118			
	Total HpCDD # Homologues	2	1			
	2,3,7,8-TCDF (pg/g)	0.047 M,J,R	<0.040 [U]			
	1,2,3,7,8-PeCDF (pg/g)	<0.019 [U]	<0.039 [U]			
	2,3,4,7,8-PeCDF (pg/g)	<0.018 [U]	<0.035 [U]			
	1,2,3,4,7,8-HxCDF (pg/g)	<0.029 [U]	<0.036 [U]			
	1,2,3,6,7,8-HxCDF (pg/g)	<0.027 M,U	<0.031 [U]			
	1,2,3,7,8,9-HxCDF (pg/g)	<0.037 M,U	<0.043 [U]			
	2,3,4,6,7,8-HxCDF (pg/g)	<0.027 [U]	<0.030 [U]			
	1,2,3,4,6,7,8-HpCDF (pg/g)	0.062 M,J,R	<0.063 M,U			
	1,2,3,4,7,8,9-HpCDF (pg/g)	<0.030 [U]	<0.093 [U]			
	OCDF (pg/g)	0.039 M,J,R	<0.073 M,U			
	Total-TCDF (pg/g)	0.226	<0.040 [U]			
	Total TCDF # Homologues	1	0			
	Total-PeCDF (pg/g)	<0.019 [U]	<0.039 [U]			
	Total PeCDF # Homologues	0	0			
	Total-HxCDF (pg/g)	<0.037 [U]	<0.043 [U]			
	Total HxCDF # Homologues	0	0			
	Total-HpCDF (pg/g)	<0.030 [U]	<0.093 [U]			
	Total HpCDF # Homologues	0	0			
	Surrogate: 13C12-2,3,7,8-TCDD (%)	71.0	72.0			
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)	62.0	62.0			
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)	79.0	78.0			
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)	92.0	98.0			
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)	83.0	88.0			
	Surrogate: 13C12-OCDD (%)	69.0	74.0			
	Surrogate: 13C12-2,3,7,8-TCDF (%)	75.0	73.0			
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)	67.0	69.0			
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)	65.0	64.0			
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)	81.0	83.0			
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)	92.0	100.0			
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)	88.0	92.0			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731264-1	L1731264-2	L1731264-3	L1731264-4	L1731264-5
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	01-FEB-16	01-FEB-16	01-FEB-16	01-FEB-16	01-FEB-16
	Sampled Time	13:26	13:31	13:35	13:40	13:46
	Client ID	PCS08 (0-0.2)	PCS08 (0.2.-0.4)	PCS08 (0.4-0.6)	PCS08 (0.6-0.8)	PCS08 (0.8-1.06)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)	82.0	73.0	81.0	87.0	84.0
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)	79.0	71.0	78.0	82.0	83.0
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)	83.0	79.0	83.0	87.0	88.0
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)	70.0	58.0	110.0	65.0	72.0
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)	1.44	0.186	0.0171	0.00981	0.000597
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)	1.80	0.318	0.0911	0.0452	0.0389
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)	1.80	0.394	0.133	0.0786	0.0748

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731264-6	L1731264-7	L1731264-8	L1731264-9	L1731264-10
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	01-FEB-16	01-FEB-16	01-FEB-16	02-FEB-16	02-FEB-16
	Sampled Time	14:01	14:08	14:11	10:37	10:42
	Client ID	PCL08 (0-0.5)	PCL08 (0.5-1.0)	PCL08 (1.0-1.3)	PCL29 (0-0.5)	PCL29 (0.5-1.0)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)					
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)					
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)					
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)					
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1731264-11	L1731264-12	L1731264-13	L1731264-14	L1731264-15
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16
Sampled Time	10:46	10:55	10:59	12:04	12:05
Client ID	PCL29 (1.0-1.5)	PCL29 (1.5-2.0)	PCL29 (2.0-2.34)	PCS32 (0-0.2)	PCS32 (0.2-0.4)
Grouping **Analyte**					
SOIL					
Dioxins and Furans Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)				77.0	78.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)				77.0	79.0
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)				84.0	82.0
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)				63.0	61.0
Toxic Equivalency Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)				0.702	0.0983
Mid Point PCDD/F TEQ (WHO 2005) (pg/g)				0.941	0.170
Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)				0.994	0.210

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731264-16	L1731264-17	L1731264-18	L1731264-23	L1731264-24
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16
	Sampled Time	12:09	12:11	12:15	13:46	13:50
	Client ID	PCS32 (0.4-0.6)	PCS32 (0.6-0.8)	PCS32 (0.8-1.0)	PCL23 (0-0.5)	PCL23 (0.5-1.0)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)	78.0	77.0	81.0		
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)	75.0	77.0	79.0		
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)	76.0	78.0	79.0		
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)	64.0	62.0	62.0		
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.00829	0.00432	0.00661		
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)	0.0573	0.0483	0.0459		
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.105	0.0916	0.0850		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731264-25	L1731264-26	L1731264-27	L1731264-28	L1731264-29
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16
	Sampled Time	13:54	14:00	14:04	14:50	15:00
	Client ID	PCL23 (1.0-1.5)	PCL23 (1.5-2.0)	PCL23 (2.0-2.2)	SS12 (0-0.075)	SS14 (0-0.075)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)					
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)					
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)					
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)					
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731264-30	L1731264-31	L1731264-32	L1731264-33	L1731264-34
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16	02-FEB-16
	Sampled Time	15:25	15:49			
	Client ID	SS16 (0-0.075)	SS18 (0-0.075)	SPLIT 8 (0-0.5)	SPLIT 8 (0.5-1.0)	SPLIT 8 (1.0-1.5)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)					
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)					
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)					
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)					
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)					

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1731264-35	L1731264-36	L1731264-37	L1731264-38	L1731264-39
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	02-FEB-16	02-FEB-16	01-FEB-16	01-FEB-16	01-FEB-16
Sampled Time					
Client ID	SPLIT 8 (1.5-2.0)	SPLIT 8 (2.0-2.2)	SPLIT 7 (0-0.2)	SPLIT 7 (0.2-0.4)	SPLIT 7 (0.4-0.6)
Grouping / **Analyte**					
SOIL					
Dioxins and Furans					
Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)			81.0	77.0	72.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)			82.0	75.0	71.0
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)			83.0	78.0	75.0
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)			70.0	63.0	64.0
Toxic Equivalency					
Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)			1.25	0.393	0.0302
Mid Point PCDD/F TEQ (WHO 2005) (pg/g)			1.80	0.459	0.0918
Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)			1.81	0.505	0.153

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1731264-40	L1731264-41			
	Description	SEDIMENT	SEDIMENT			
	Sampled Date	01-FEB-16	01-FEB-16			
	Sampled Time					
	Client ID	SPLIT 7 (06.-0.8)	SPLIT 7 (0.8-1.06)			
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)	85.0	87.0			
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)	85.0	89.0			
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)	86.0	89.0			
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)	64.0	71.0			
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.000819	0.000220			
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)	0.0618	0.0792			
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.117	0.157			

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	1,2,3,4,6,7,8-HpCDD	M,U	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	1,2,3,7,8,9-HxCDF	M,U	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	OCDD	M,U	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	OCDF	M,U	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	1,2,3,4,6,7,8-HpCDF	[U]	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	1,2,3,4,7,8,9-HpCDF	[U]	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	1,2,3,4,7,8-HxCDD	[U]	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	1,2,3,4,7,8-HxCDF	[U]	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	1,2,3,6,7,8-HxCDD	[U]	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	1,2,3,6,7,8-HxCDF	[U]	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	1,2,3,7,8,9-HxCDD	[U]	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	1,2,3,7,8-PeCDD	[U]	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	1,2,3,7,8-PeCDF	[U]	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	2,3,4,6,7,8-HxCDF	[U]	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	2,3,4,7,8-PeCDF	[U]	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	2,3,7,8-TCDD	[U]	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	2,3,7,8-TCDF	[U]	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	Total-HpCDD	[U]	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	Total-HpCDF	[U]	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	Total-HxCDD	[U]	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	Total-HxCDF	[U]	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	Total-PeCDD	[U]	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	Total-PeCDF	[U]	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	Total-TCDD	[U]	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5
Method Blank	Total-TCDF	[U]	L1731264-1, -14, -15, -16, -17, -18, -2, -3, -37, -38, -39, -4, -40, -41, -5

Qualifiers for Individual Parameters Listed:

Qualifier	Description
J,R	The analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,J	A peak has been manually integrated, and the analyte was detected below the calibrated range but above the EDL.
M,J,R	A peak has been manually integrated, the analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,U	A peak has been manually integrated, and the analyte was not detected above the EDL.
[J]	The analyte was detected below the calibrated range but above the EDL.
[U]	The analyte was not detected above the EDL.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-TOT-ORG-LECO-SK	Soil	Organic Carbon by combustion method	SSSA (1996) p. 973

Total Organic Carbon (C-TOT-ORG-LECO-SK, C-TOT-ORG-SK)

Total C and inorganic C are determined on separate samples. The total C is determined by combustion and thermal conductivity detection, while inorganic C is determined by weight lass after addition of hydrochloric acid. Organic C is calculated by the difference between these two determinations.

Reference for Total C:
Nelson, D.W. and Sommers, L.E. 1996. Total Carbon, organic carbon and organic matter. P. 961-1010 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

Reference for Inorganic C:
Loeppert, R.H. and Suarez, D.L. 1996. Gravimetric Method for Loss of Carbon Dioxide. P. 455-456 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

CL-PASTE-COLOR-VA	Soil	Chloride in Soil (Paste) by Colourimetry	Carter-CSSS / APHA 4500-Cl E (modified)

A soil extract produced by the saturated paste extraction procedure is analyzed for chloride by ferricyanide colourimetry.

DX-1613B-HRMS-BU	Soil	Dioxins and Furans HR 1613B	USEPA 1613B

Samples are extracted by Soxhlet. The extracts are prepared using column chromatography, reduced in volume and analyzed by isotope-dilution GC/HRMS

HG-200.2-CVAF-VA	Soil	Mercury in Soil by CVAFS	EPA 200.2/1631E (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAFS.

MET-200.2-CCMS-VA	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample matrix, for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V.

MET-PASTE-ICP-VA	Soil	Metals in Soil (Paste) by ICPOES	Carter-CSSS / EPA 6010B (modified)

A soil extract produced by the saturated paste extraction procedure is analyzed for Sodium, Calcium, and Magnesium by ICPOES as per "Soil Sampling and Methods of Analysis" by M. Carter.

MOIST-SK	Soil	Moisture Content	ASTM D2216-80

The weighed portion of soil is placed in a 105°C oven overnight. The dried soil is allowed to cooled to room temperature, weighed and the % moisture is calculated.

Reference: ASTM D2216-80

MOISTURE-BU	Soil	% Moisture	ASTM METHOD D2974-00
MOISTURE-VA	Soil	Moisture content	ASTM D2974-00 Method A

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

PAH-BCCSR-CL	Soil	PAHs - BC CSR Regs	EPA 3570/8270-GC/MS
PAH-SUM-CALC-VA	Soil	Sum of PAH's	CALCULATION

Total PAH represents the sum of all PAH analytes reported for a given sample. Note that regulatory agencies and criteria differ in their definitions of Total PAH in terms of the individual PAH analytes to be included.

PCB-CSR-SUM-CALC-VA	Soil	Total PCB (BC CSR) in soil	BC Contaminated Sites Regulation

Calculation of Total PCB to meet BC Contaminated Sites Regulation. Total PCB (BC CSR) is the sum of the concentrations of PCB aroclors 1242, 1248, 1254 and 1260. Results below detection limit (DL) are treated as zero. The Total PCB detection limit is equal to the highest of the aroclor detection limits used in the sum.

PCB-SE-ECD-VA	Soil	PCB by Extraction with GCECD	EPA8082, 3630

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3500, 3620, 3630, 3660, 3665 & 8082, published by the United States Environmental Protection Agency (EPA). The procedure involves a solid-liquid extraction of a subsample of the sediment/soil using a mixture of hexane and acetone. Water is added to the extract and the resulting hexane extract undergoes one or more of the following clean-up procedures (if required): florisil clean-up, silica gel clean-up, sulphur clean-up and/or sulphuric acid clean-up. The final extract is analysed by capillary column gas chromatography with electron capture detection (GC/ECD).

PCB-SUM-CALC-VA	Soil	Total PCBs in soil	CALCULATION

Calculation of Total PCB. Total PCB is the sum of the concentrations of PCB aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, and 1268. Results below detection limit (DL) are treated as zero. The Total PCB detection limit is equal to the highest of the aroclor detection limits used in the

Reference Information

sum.

PSA-PIPET-DETAIL-SK	Soil	Particle size - Sieve and Pipette	SSIR-51 METHOD 3.2.1

Particle size distribution is determined by a combination of techniques. Dry sieving is performed for coarse particles, wet sieving for sand particles and the pipette sedimentation method for clay particles.

Reference:

Burt, R. (2009). Soil Survey Field and Laboratory Methods Manual. Soil Survey Investigations Report No. 5. Method 3.2.1.2.2. United States Department of Agriculture Natural Resources Conservation Service.

SAT-PCNT-VA	Soil	Saturation Percentage	Carter-CSSS

Saturation Percentage (SP) is the total volume of water present in a saturated paste (in mL) divided by the dry weight of the sample (in grams), expressed as a percentage, as described in "Soil Sampling and Methods of Analysis" by M. Carter.

WHO1998-FISH-EDL-BU	Soil	WHO1998Toxic Equivalency-Fish ND=EDL	Calculation
WHO1998-FISH-HALF-BU	Soil	WHO1998Toxic Equivalency-Fish ND=1/2EDL	Calculation
WHO1998-FISH-ZERO-BU	Soil	WHO1998Toxic Equivalency-Fish ND=0	Calculation

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA
BU	ALS ENVIRONMENTAL - BURLINGTON, ONTARIO, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # N/A

Report To		**Report Format / Distribution**	**Service Requested** (Rush for routine analysis subject to availability)
Company:	Stantec Consulting Ltd.	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Molly Brewis	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400A-2261 Keating Cross Road	Email 1: molly.brewis@stantec.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saanichton, BC V8M 2A5	Email 2: karen.munro@stantec.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-858-9969 Fax: 250-544-1105	Email 3: stefan.dick@stantec.com	**Analysis Request**
Invoice To	Same as Report ? ☑ Yes ☐ No	**Client / Project Information**	Please Indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 123220054 task 225.101	
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #:	
Lab Work Order # (lab use only)		**ALS Contact:** Brent Mack	**Sampler:** SW & BT

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-OD-200.2-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU		Archive			Number of Containers
	PCS08 (0-0.2)	01-Feb-16	13:26	SEDIMENT				X	X	X		X					2
	PCS08 (0.2-0.4)	01-Feb-16	13:31	SEDIMENT				X	X	X		X					2
	PCS08 (0.4-0.6)	01-Feb-16	13:35	SEDIMENT				X	X	X		X					2
	PCS08 (0.6-0.8)	01-Feb-16	13:40	SEDIMENT				X	X	X		X					2
	PCS08 (0.8-1.06)	01-Feb-16	13:46	SEDIMENT				X	X	X		X					2
	PCL08 (0-0.5)	01-Feb-16	14:01	SEDIMENT	X	X	X	X	X	X	X						3
	PCL08 (0.5-1.0)	01-Feb-16	14:08	SEDIMENT	X	X	X	X	X	X	X						3
	PCL08 (1.0-1.3)	01-Feb-16	14:11	SEDIMENT	X	X	X	X	X	X	X						3

L1731264-COFC

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Detailed breakdown of particle size for clay and silt fractions. Dioxins and Furans to be reported with WHO 1998 fish TEQs. Some samples for analysis AND archival. Archived samples to be held for 6 months.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Sandra Warren	3-Feb-16	8:00	Lady	Feb 4	1:30PM	8/8/7/8 °C				

ALS Environmental

Chain of C
Can

L1731264-COFC

COC # N/A

Report To		Report Format /		Requested (Rush for routine analysis subject to availability)
Company:	Stantec Consulting Ltd.	☑ Standard ☐ Other		◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Molly Brewis	☑ PDF ☑ Excel ☐ Digital ☐ Fax		○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400A-2261 Keating Cross Road	Email 1: molly.brewis@stantec.com		○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saanichton, BC V8M 2A5	Email 2: karen.munro@stantec.com		○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-858-9969 Fax: 250-544-1105	Email 3: stefan.dick@stantec.com		
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information		Analysis Request
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 123220054 task 225.101		Please Indicate below Filtered, Preserved or both (F, P, F/P)
Company:		PO / AFE:		
Contact:		LSD:		
Address:				
Phone:	Fax:	Quote #:		
Lab Work Order # (lab use only)		ALS Contact: Brent Mack	Sampler: SW & BT	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-OD-200.2-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU		Archive			Number of Containers
	PCL29 (0-0.5)	02-Feb-16	10:37	SEDIMENT	X	X	X	X	X	X	X						3
	PCL29 (0.5-1.0)	02-Feb-16	10:42	SEDIMENT	X	X	X	X	X	X	X						3
	PCL29 (1.0-1.5)	02-Feb-16	10:46	SEDIMENT	X	X	X	X	X	X	X						3
	PCL29 (1.5-2.0)	02-Feb-16	10:55	SEDIMENT				X	X					X			2
	PCL29 (2.0-2.34)	02-Feb-16	10:59	SEDIMENT				X	X					X			2
	PCS32 (0-0.2)	02-Feb-16	12:04	SEDIMENT				X	X	X		X					2
	PCS32 (0.2-0.4)	02-Feb-16	12:05	SEDIMENT				X	X	X		X					2
	PCS32 (0.4-0.6)	02-Feb-16	12:09	SEDIMENT				X	X	X		X					2
	PCS32 (0.6-0.8)	02-Feb-16	12:11	SEDIMENT				X	X	X		X					2
	PCS32 (0.8-1.0)	02-Feb-16	12:15	SEDIMENT				X	X	X		X					2
	PCS32 (1.0-1.2)	02-Feb-16	12:19	SEDIMENT										X			2
	PCS32 (1.2-1.4)	02-Feb-16	12:22	SEDIMENT										X			2
	PCS32 (1.4-1.6)	02-Feb-16	12:26	SEDIMENT										X			2
	PCS32 (1.6-1.8)	02-Feb-16	12:29	SEDIMENT										X			2
	PCL23 (0-0.5)	02-Feb-16	13:46	SEDIMENT	X	X	X	X	X	X	X						3

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Detailed breakdown of particle size for clay and silt fractions. Dioxins and Furans to be reported with WHO 1998 fish TEQs. Some samples for analysis AND archival. Archived samples to be held for 6 months.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

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Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Sandra Warren	3-Feb-16	8:00	lady	Feb 4	1:30PM	8/8/7/8 °C				

ALS Environmental

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Canada T
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L1731264-COFC

COC # N/A

Report To		Report Format / Dist.				ad (Rush for routine analysis subject to availability)
Company:	Stantec Consulting Ltd.	☑ Standard	☐ Other			◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Molly Brewis	☑ PDF	☑ Excel	☐ Digital	☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400A-2261 Keating Cross Road	Email 1:	molly.brewis@stantec.com			○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saanichton, BC V8M 2A5	Email 2:	karen.munro@stantec.com			○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-858-9969 Fax: 250-544-1105	Email 3:	stefan.dick@stantec.com			**Analysis Request**
Invoice To	Same as Report ? ☑ Yes ☐ No	**Client / Project Information**				Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #:	123220054 task 225.101			
Company:		PO / AFE:				
Contact:		LSD:				
Address:						
Phone:	Fax:	Quote #:				
Lab Work Order # (lab use only)		**ALS Contact:**	Brent Mack	**Sampler:**	SW & BT	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-OD-200.2-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU		Archive			Number of Containers
	PCL23 (0.5-1.0)	02-Feb-16	13:50	SEDIMENT	X	X	X	X	X	X	X						3
	PCL23 (1.0-1.5)	02-Feb-16	13:54	SEDIMENT	X	X	X	X	X	X	X						3
	PCL23 (1.5-2.0)	02-Feb-16	14:00	SEDIMENT				X	X					X			2
	PCL23 (2.0-2.2)	02-Feb-16	14:04	SEDIMENT				X	X					X			2
	SS12 (0-0.075)	02-Feb-16	14:50	SEDIMENT	X	X	X	X	X	X	X						3
	SS14 (0-0.075)	02-Feb-16	15:00	SEDIMENT	X	X	X	X	X	X	X						3
	SS16 (0-0.075)	02-Feb-16	15:25	SEDIMENT	X	X	X	X	X	X	X						3
	SS18 (0-0.075)	02-Feb-16	15:49	SEDIMENT	X	X	X	X	X	X	X						3
	SPLIT 8 (0-0.5)	02-Feb-16		SEDIMENT	X	X	X	X	X	X							2
	SPLIT 8 (0.5-1.0)	02-Feb-16		SEDIMENT	X	X	X	X	X	X							2
	SPLIT 8 (1.0-1.5)	02-Feb-16		SEDIMENT	X	X	X	X	X	X							2
	SPLIT 8 (1.5-2.0)	02-Feb-16		SEDIMENT				X	X					X			2
	SPLIT 8 (2.0-2.2)	02-Feb-16		SEDIMENT				X	X					X			2

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Detailed breakdown of particle size for clay and silt fractions. Dioxins and Furans to be reported with WHO 1998 fish TEQs. Some samples for analysis AND archival. Archived samples to be held for 6 months.

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SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Sandra Warren	3-Feb-16	8:00	lady	Feb 4	1:30pm	4/8/7°C				

STANTEC CONSULTING LTD.
ATTN: Molly Brewis
400 - 2261 Keating Cross Road
Saanichton BC V8M 2A5

Date Received: 20-JAN-16
Report Date: 18-MAR-16 16:32 (MT)
Version: FINAL REV. 3

Client Phone: 250-655-6979

Certificate of Analysis

Lab Work Order #: L1725545

Project P.O. #: NOT SUBMITTED
Job Reference: 123220054 TASK 225.101
C of C Numbers:
Legal Site Desc:

Comments: 7-MAR-2016 This report replaces the previous version and contains additional analyses, as requested.
18-MAR-2016 Mercury data updated for sample #21

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1725545-1	L1725545-2	L1725545-3	L1725545-4	L1725545-5
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	17-JAN-16	17-JAN-16	17-JAN-16	17-JAN-16	17-JAN-16
Sampled Time	15:43	15:07	15:13	15:22	15:30
Client ID	PCL22 (0-0.4)	PCL24 (0-0.5)	PCL24 (0.5-1.0)	PCL24 (1.0-1.5)	PCL24 (1.5-2.0)
Grouping / **Analyte**					
SOIL					
Physical Tests / % Moisture (%)					16.4
Moisture (%)	16.0	30.2	26.6	24.5	
Particle Size / % Gravel (>2mm) (%)	12.0	0.91	0.61	1.87	6.80
% Sand (2.00mm - 1.00mm) (%)	13.5	1.88	1.79	3.75	8.02
% Sand (1.00mm - 0.50mm) (%)	11.4	1.94	2.24	4.29	7.38
% Sand (0.50mm - 0.25mm) (%)	23.8	3.88	3.56	8.42	10.1
% Sand (0.25mm - 0.125mm) (%)	30.2	25.7	24.9	39.2	20.8
% Sand (0.125mm - 0.063mm) (%)	3.18	19.7	21.0	18.7	13.7
% Silt (0.063mm - 0.0312mm) (%)	1.66	11.1	11.9	7.68	9.37
% Silt (0.0312mm - 0.004mm) (%)	1.94	19.4	18.9	8.76	13.3
% Clay (<4um) (%)	2.33	15.5	15.1	7.32	10.6
Texture	Sand	Sandy loam	Sandy loam	Loamy sand	Sandy loam
Organic / Inorganic Carbon / Total Organic Carbon (%)	0.63	1.35	1.22	0.79	
Saturated Paste Extractables / Chloride (Cl) (mg/kg)	2880	5640	5020	4590	
% Saturation (%)	26.2	41.8	42.9	32.9	
Sodium (Na) (mg/kg)	1490	3080	2690	2490	
Metals / Arsenic (As) (mg/kg)	2.00	7.97	8.05	6.08	
Cadmium (Cd) (mg/kg)	<0.050	0.140	0.149	0.223	
Chromium (Cr) (mg/kg)	15.2	19.8	20.2	14.6	
Copper (Cu) (mg/kg)	3.54	19.1	16.5	9.50	
Lead (Pb) (mg/kg)	2.04	5.53	3.94	2.50	
Mercury (Hg) (mg/kg)	0.0068	0.0373	0.0241	0.0141	
Nickel (Ni) (mg/kg)	4.71	14.6	14.7	9.49	
Zinc (Zn) (mg/kg)	27.8	57.1	53.1	35.3	
Polycyclic Aromatic Hydrocarbons / Acenaphthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
Acenaphthylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
Anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
Benz(a)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
Benzo(a)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
Benzo(b)fluoranthene (mg/kg)	<0.050	0.059	<0.050	<0.050	
Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
Chrysene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1725545-6 SEDIMENT 17-JAN-16 12:21 PCS24 (0-0.2)	L1725545-7 SEDIMENT 17-JAN-16 12:29 PCS24 (0.2-0.4)	L1725545-8 SEDIMENT 17-JAN-16 12:35 PCS24 (0.4-0.6)	L1725545-9 SEDIMENT 17-JAN-16 12:42 PCS24 (0.6-0.8)	L1725545-10 SEDIMENT 17-JAN-16 12:47 PCS24 (0.8-1.0)
Sample ID						
Description						
Sampled Date						
Sampled Time						
Client ID						
SOIL						
Physical Tests	% Moisture (%)	27.7	24.2	22.7	23.0	21.6
	Moisture (%)					
Particle Size	% Gravel (>2mm) (%)	0.95	2.47	3.22	4.55	3.14
	% Sand (2.00mm - 1.00mm) (%)	1.56	4.19	4.89	5.90	6.76
	% Sand (1.00mm - 0.50mm) (%)	2.02	3.24	4.18	6.05	6.32
	% Sand (0.50mm - 0.25mm) (%)	7.19	5.78	7.46	10.0	12.6
	% Sand (0.25mm - 0.125mm) (%)	36.4	30.5	30.3	30.7	32.6
	% Sand (0.125mm - 0.063mm) (%)	15.9	18.7	18.6	16.7	15.6
	% Silt (0.063mm - 0.0312mm) (%)	8.51	9.62	9.53	7.44	6.74
	% Silt (0.0312mm - 0.004mm) (%)	15.1	14.2	12.3	10.1	8.28
	% Clay (<4um) (%)	12.4	11.3	9.52	8.53	7.98
	Texture	Sandy loam	Sandy loam	Sandy loam	Sandy loam	Loamy sand
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.10	1.05	0.88	0.95	0.75
Saturated Paste Extractables	Chloride (Cl) (mg/kg)					
	% Saturation (%)					
	Sodium (Na) (mg/kg)					
Metals	Arsenic (As) (mg/kg)					
	Cadmium (Cd) (mg/kg)					
	Chromium (Cr) (mg/kg)					
	Copper (Cu) (mg/kg)					
	Lead (Pb) (mg/kg)					
	Mercury (Hg) (mg/kg)					
	Nickel (Ni) (mg/kg)					
	Zinc (Zn) (mg/kg)					
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)					
	Acenaphthylene (mg/kg)					
	Anthracene (mg/kg)					
	Benz(a)anthracene (mg/kg)					
	Benzo(a)pyrene (mg/kg)					
	Benzo(b)fluoranthene (mg/kg)					
	Benzo(g,h,i)perylene (mg/kg)					
	Benzo(k)fluoranthene (mg/kg)					
	Chrysene (mg/kg)					
	Dibenz(a,h)anthracene (mg/kg)					

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1725545-12	L1725545-13	L1725545-14	L1725545-15	L1725545-16
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	17-JAN-16	17-JAN-16	17-JAN-16	17-JAN-16	17-JAN-16
Sampled Time					
Client ID	SPLIT 1 (0-0.2)	SPLIT 1 (0.2-0.4)	SPLIT 1 (0.4-0.6)	SPLIT 1 (0.6-0.8)	SPLIT 1 (0.8-1.0)
Grouping **Analyte**					
SOIL					
Physical Tests % Moisture (%)	26.8	23.8	22.6	22.6	22.3
Moisture (%)					
Particle Size % Gravel (>2mm) (%)	1.48	1.91	2.83	3.95	3.13
% Sand (2.00mm - 1.00mm) (%)	2.26	4.04	4.74	5.48	6.73
% Sand (1.00mm - 0.50mm) (%)	2.11	4.16	3.95	5.51	6.08
% Sand (0.50mm - 0.25mm) (%)	7.38	7.08	7.58	11.0	12.2
% Sand (0.25mm - 0.125mm) (%)	32.6	31.8	33.4	31.3	32.5
% Sand (0.125mm - 0.063mm) (%)	16.0	16.9	16.4	17.2	16.1
% Silt (0.063mm - 0.0312mm) (%)	9.35	9.75	9.25	7.37	6.89
% Silt (0.0312mm - 0.004mm) (%)	16.5	14.2	12.7	9.60	8.48
% Clay (<4um) (%)	12.4	10.2	9.15	8.61	7.86
Texture	Sandy loam	Sandy loam	Sandy loam	Sandy loam / Loamy sand	Loamy sand
Organic / Inorganic Carbon Total Organic Carbon (%)	1.12	1.18	0.94	0.85	0.77
Saturated Paste Extractables Chloride (Cl) (mg/kg)					
% Saturation (%)					
Sodium (Na) (mg/kg)					
Metals Arsenic (As) (mg/kg)					
Cadmium (Cd) (mg/kg)					
Chromium (Cr) (mg/kg)					
Copper (Cu) (mg/kg)					
Lead (Pb) (mg/kg)					
Mercury (Hg) (mg/kg)					
Nickel (Ni) (mg/kg)					
Zinc (Zn) (mg/kg)					
Polycyclic Aromatic Hydrocarbons Acenaphthene (mg/kg)					
Acenaphthylene (mg/kg)					
Anthracene (mg/kg)					
Benz(a)anthracene (mg/kg)					
Benzo(a)pyrene (mg/kg)					
Benzo(b)fluoranthene (mg/kg)					
Benzo(g,h,i)perylene (mg/kg)					
Benzo(k)fluoranthene (mg/kg)					
Chrysene (mg/kg)					
Dibenz(a,h)anthracene (mg/kg)					

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ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1725545-17	L1725545-18	L1725545-19	L1725545-20	L1725545-21
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	18-JAN-16	18-JAN-16	18-JAN-16	18-JAN-16	18-JAN-16
	Sampled Time	11:47	13:46	14:02	14:12	14:17
	Client ID	PCL18 (0-0.5)	PCL11 (0-0.5)	PCL11 (0.5-1.0)	PCL11 (1.0-1.5)	PCL11 (1.5-2.0)
Grouping	**Analyte**					
SOIL						
Physical Tests	% Moisture (%)					14.0
	Moisture (%)	37.1	35.3	28.4	21.4	
Particle Size	% Gravel (>2mm) (%)	6.38	0.37	0.98	6.37	5.03
	% Sand (2.00mm - 1.00mm) (%)	6.58	0.17	2.59	4.08	3.73
	% Sand (1.00mm - 0.50mm) (%)	7.79	0.32	3.79	10.9	5.46
	% Sand (0.50mm - 0.25mm) (%)	7.63	0.61	7.23	22.6	10.9
	% Sand (0.25mm - 0.125mm) (%)	5.97	0.67	6.35	14.0	16.7
	% Sand (0.125mm - 0.063mm) (%)	5.80	1.40	7.58	11.9	17.6
	% Silt (0.063mm - 0.0312mm) (%)	10.4	17.6	17.3	8.26	12.2
	% Silt (0.0312mm - 0.004mm) (%)	26.1	46.0	32.3	12.2	15.8
	% Clay (<4um) (%)	23.4	32.9	21.9	9.84	12.7
	Texture	Loam	Silt loam / Silty clay loam	Silt loam	Sandy loam	Sandy loam
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.23	1.31	0.84	0.62	
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	8000	8000	5890	4040	
	% Saturation (%)	54.6	69.2	51.0	29.5	
	Sodium (Na) (mg/kg)	4420	4800	3080	2180	
Metals	Arsenic (As) (mg/kg)	12.3	10.9	10.5	7.50	3.28
	Cadmium (Cd) (mg/kg)	0.218	0.133	0.154	0.195	0.130
	Chromium (Cr) (mg/kg)	21.9	27.9	23.4	16.4	22.7
	Copper (Cu) (mg/kg)	23.2	34.4	24.0	13.7	19.5
	Lead (Pb) (mg/kg)	5.85	8.85	5.85	3.55	2.71
	Mercury (Hg) (mg/kg)	0.0341	0.0556	0.0340	0.0193	0.0150
	Nickel (Ni) (mg/kg)	20.1	26.7	21.2	13.9	15.9
	Zinc (Zn) (mg/kg)	68.8	90.6	71.8	45.5	46.7
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Acenaphthylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Benz(a)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Benzo(a)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Benzo(b)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Chrysene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1725545-22 SEDIMENT 18-JAN-16 SPLIT 2 (0-0.5)	L1725545-23 SEDIMENT 18-JAN-16 SPLIT 2 (0.5-1.0)	L1725545-24 SEDIMENT 18-JAN-16 SPLIT 2 (1.0-1.5)	L1725545-25 SEDIMENT 18-JAN-16 12:30 PCS11 (0-0.2)	L1725545-26 SEDIMENT 18-JAN-16 12:37 PCS11 (0.2-0.4)
SOIL						
Physical Tests	% Moisture (%)				38.9	35.2
	Moisture (%)	35.2	26.2	19.8		
Particle Size	% Gravel (>2mm) (%)	0.10	1.14	5.13	<0.10	<0.10
	% Sand (2.00mm - 1.00mm) (%)	0.17	2.43	5.53	0.14	<0.10
	% Sand (1.00mm - 0.50mm) (%)	0.25	3.35	11.4	0.11	<0.10
	% Sand (0.50mm - 0.25mm) (%)	0.53	7.77	22.7	0.15	0.24
	% Sand (0.25mm - 0.125mm) (%)	0.77	7.22	13.5	0.38	0.59
	% Sand (0.125mm - 0.063mm) (%)	3.22	9.17	13.0	2.40	3.48
	% Silt (0.063mm - 0.0312mm) (%)	17.2	16.7	7.81	17.8	16.7
	% Silt (0.0312mm - 0.004mm) (%)	45.3	30.5	11.4	46.9	45.7
	% Clay (<4um) (%)	32.6	21.7	9.55	32.0	33.1
	Texture	Silt loam	Silt loam / Loam	Sandy loam	Silt loam	Silt loam
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.22	0.90	0.61	2.25	1.28
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	7700	5430	3440		
	% Saturation (%)	69.2	49.7	29.5		
	Sodium (Na) (mg/kg)	4140	2900	1820		
Metals	Arsenic (As) (mg/kg)	12.3	10.8	6.98		
	Cadmium (Cd) (mg/kg)	0.144	0.149	0.186		
	Chromium (Cr) (mg/kg)	29.7	23.0	15.7		
	Copper (Cu) (mg/kg)	36.8	23.9	12.7		
	Lead (Pb) (mg/kg)	8.89	5.85	3.34		
	Mercury (Hg) (mg/kg)	0.0594	0.0334	0.0185		
	Nickel (Ni) (mg/kg)	28.6	21.1	13.1		
	Zinc (Zn) (mg/kg)	96.4	71.8	43.1		
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050	<0.050	<0.050		
	Acenaphthylene (mg/kg)	<0.050	<0.050	<0.050		
	Anthracene (mg/kg)	<0.050	<0.050	<0.050		
	Benz(a)anthracene (mg/kg)	<0.050	<0.050	<0.050		
	Benzo(a)pyrene (mg/kg)	<0.050	<0.050	<0.050		
	Benzo(b)fluoranthene (mg/kg)	<0.050	<0.050	<0.050		
	Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050	<0.050		
	Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050	<0.050		
	Chrysene (mg/kg)	<0.050	<0.050	<0.050		
	Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050	<0.050		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1725545-27	L1725545-28	L1725545-29	L1725545-33	L1725545-34
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	18-JAN-16	18-JAN-16	18-JAN-16	18-JAN-16	18-JAN-16
Sampled Time	12:40	12:51	13:18	16:13	16:17
Client ID	PCS11 (0.4-0.6)	PCS11 (0.6-0.8)	PCS11 (0.8-1.0)	PCL09 (0-0.5)	PCL09 (0.5-1.0)
Grouping / **Analyte**					
SOIL					
Physical Tests % Moisture (%)	34.4	31.5	31.0		
Moisture (%)				32.6	29.1
Particle Size % Gravel (>2mm) (%)	<0.10	1.22	0.36	0.22	0.18
% Sand (2.00mm - 1.00mm) (%)	<0.10	1.32	0.97	0.31	0.76
% Sand (1.00mm - 0.50mm) (%)	0.12	1.43	2.02	0.48	0.65
% Sand (0.50mm - 0.25mm) (%)	0.34	2.92	4.60	1.60	2.46
% Sand (0.25mm - 0.125mm) (%)	0.57	2.94	4.41	22.1	34.0
% Sand (0.125mm - 0.063mm) (%)	3.46	6.88	7.60	13.4	14.7
% Silt (0.063mm - 0.0312mm) (%)	16.3	19.3	18.3	12.6	11.5
% Silt (0.0312mm - 0.004mm) (%)	44.4	38.0	36.3	28.3	19.2
% Clay (<4um) (%)	34.8	25.9	25.4	21.1	16.6
Texture	Silty clay loam	Silt loam	Silt loam	Loam	Sandy loam
Organic / Inorganic Carbon Total Organic Carbon (%)	1.22	1.01	1.05	1.43	1.27
Saturated Paste Extractables Chloride (Cl) (mg/kg)				6710	5670
% Saturation (%)				55.7	42.5
Sodium (Na) (mg/kg)				3540	3070
Metals Arsenic (As) (mg/kg)				10.5	8.94
Cadmium (Cd) (mg/kg)				0.152	0.134
Chromium (Cr) (mg/kg)				24.0	19.1
Copper (Cu) (mg/kg)				28.3	18.8
Lead (Pb) (mg/kg)				7.51	4.58
Mercury (Hg) (mg/kg)				0.0451	0.0309
Nickel (Ni) (mg/kg)				20.2	15.6
Zinc (Zn) (mg/kg)				72.5	54.9
Polycyclic Aromatic Hydrocarbons Acenaphthene (mg/kg)				<0.050	<0.050
Acenaphthylene (mg/kg)				<0.050	<0.050
Anthracene (mg/kg)				<0.050	<0.050
Benz(a)anthracene (mg/kg)				<0.050	<0.050
Benzo(a)pyrene (mg/kg)				<0.050	<0.050
Benzo(b)fluoranthene (mg/kg)				<0.050	<0.050
Benzo(g,h,i)perylene (mg/kg)				<0.050	<0.050
Benzo(k)fluoranthene (mg/kg)				<0.050	<0.050
Chrysene (mg/kg)				<0.050	<0.050
Dibenz(a,h)anthracene (mg/kg)				<0.050	<0.050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1725545-35	L1725545-36			
	Description	SEDIMENT	SEDIMENT			
	Sampled Date	18-JAN-16	18-JAN-16			
	Sampled Time	16:30	16:37			
	Client ID	PCL09 (1.0-1.5)	PCL09 (1.5-2.05)			
Grouping	**Analyte**					
SOIL						
Physical Tests	% Moisture (%)		27.4			
	Moisture (%)	27.6				
Particle Size	% Gravel (>2mm) (%)	0.12	0.18			
	% Sand (2.00mm - 1.00mm) (%)	0.64	0.89			
	% Sand (1.00mm - 0.50mm) (%)	0.73	1.22			
	% Sand (0.50mm - 0.25mm) (%)	2.47	4.11			
	% Sand (0.25mm - 0.125mm) (%)	39.6	45.2			
	% Sand (0.125mm - 0.063mm) (%)	15.7	15.6			
	% Silt (0.063mm - 0.0312mm) (%)	10.1	8.13			
	% Silt (0.0312mm - 0.004mm) (%)	16.4	12.8			
	% Clay (<4um) (%)	14.4	11.8			
	Texture	Sandy loam	Sandy loam			
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.19				
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	5710				
	% Saturation (%)	41.2				
	Sodium (Na) (mg/kg)	3120				
Metals	Arsenic (As) (mg/kg)	6.77				
	Cadmium (Cd) (mg/kg)	0.136				
	Chromium (Cr) (mg/kg)	17.4				
	Copper (Cu) (mg/kg)	14.8				
	Lead (Pb) (mg/kg)	3.79				
	Mercury (Hg) (mg/kg)	0.0217				
	Nickel (Ni) (mg/kg)	13.3				
	Zinc (Zn) (mg/kg)	47.9				
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050				
	Acenaphthylene (mg/kg)	<0.050				
	Anthracene (mg/kg)	<0.050				
	Benz(a)anthracene (mg/kg)	<0.050				
	Benzo(a)pyrene (mg/kg)	<0.050				
	Benzo(b)fluoranthene (mg/kg)	<0.050				
	Benzo(g,h,i)perylene (mg/kg)	<0.050				
	Benzo(k)fluoranthene (mg/kg)	<0.050				
	Chrysene (mg/kg)	<0.050				
	Dibenz(a,h)anthracene (mg/kg)	<0.050				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1725545-1	L1725545-2	L1725545-3	L1725545-4	L1725545-5
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	17-JAN-16	17-JAN-16	17-JAN-16	17-JAN-16	17-JAN-16
	Sampled Time	15:43	15:07	15:13	15:22	15:30
	Client ID	PCL22 (0-0.4)	PCL24 (0-0.5)	PCL24 (0.5-1.0)	PCL24 (1.0-1.5)	PCL24 (1.5-2.0)
Grouping	**Analyte**					
SOIL						
Polycyclic	Fluoranthene (mg/kg)	<0.050	0.092	<0.050	<0.050	
	Fluorene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Naphthalene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Phenanthrene (mg/kg)	<0.050	0.051	<0.050	<0.050	
	Pyrene (mg/kg)	<0.050	0.079	<0.050	<0.050	
	Surrogate: Acenaphthene d10 (%)	94.6	95.6	71.6	63.7	
	Surrogate: Chrysene d12 (%)	97.0	100.2	107.5	103.4	
	Surrogate: Naphthalene d8 (%)	70.2	87.0	82.4	77.5	
	Surrogate: Phenanthrene d10 (%)	92.4	101.2	108.2	98.8	
	Total PAHs (mg/kg)	<0.20	0.28	<0.20	<0.20	
Polychlorinated Biphenyls	Aroclor 1016 (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Aroclor 1221 (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Aroclor 1232 (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Aroclor 1242 (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Aroclor 1248 (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Aroclor 1254 (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Aroclor 1260 (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Aroclor 1262 (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Aroclor 1268 (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Surrogate: Decachlorobiphenyl (%)	76.6	102.9	117.0	96.9	
	Total PCBs (mg/kg)	<0.020	<0.020	<0.020	<0.020	
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)					
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)					
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)					
	2,3,7,8-TCDD (pg/g)					
	1,2,3,7,8-PeCDD (pg/g)					
	1,2,3,4,7,8-HxCDD (pg/g)					
	1,2,3,6,7,8-HxCDD (pg/g)					
	1,2,3,7,8,9-HxCDD (pg/g)					
	1,2,3,4,6,7,8-HpCDD (pg/g)					
	OCDD (pg/g)					
	Total-TCDD (pg/g)					
	Total TCDD # Homologues					
	Total-PeCDD (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1725545-6	L1725545-7	L1725545-8	L1725545-9	L1725545-10
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	17-JAN-16	17-JAN-16	17-JAN-16	17-JAN-16	17-JAN-16
	Sampled Time	12:21	12:29	12:35	12:42	12:47
	Client ID	PCS24 (0-0.2)	PCS24 (0.2-0.4)	PCS24 (0.4-0.6)	PCS24 (0.6-0.8)	PCS24 (0.8-1.0)
Grouping	**Analyte**					
SOIL						
Polycyclic	Fluoranthene (mg/kg)					
	Fluorene (mg/kg)					
	Indeno(1,2,3-c,d)pyrene (mg/kg)					
	Naphthalene (mg/kg)					
	Phenanthrene (mg/kg)					
	Pyrene (mg/kg)					
	Surrogate: Acenaphthene d10 (%)					
	Surrogate: Chrysene d12 (%)					
	Surrogate: Naphthalene d8 (%)					
	Surrogate: Phenanthrene d10 (%)					
	Total PAHs (mg/kg)					
Polychlorinated Biphenyls	Aroclor 1016 (mg/kg)					
	Aroclor 1221 (mg/kg)					
	Aroclor 1232 (mg/kg)					
	Aroclor 1242 (mg/kg)					
	Aroclor 1248 (mg/kg)					
	Aroclor 1254 (mg/kg)					
	Aroclor 1260 (mg/kg)					
	Aroclor 1262 (mg/kg)					
	Aroclor 1268 (mg/kg)					
	Surrogate: Decachlorobiphenyl (%)					
	Total PCBs (mg/kg)					
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)	1.238472	0.436125	0.7719908	0.49981	0.416711
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)	1.041572	0.225725	0.3860658	0.25006	0.2083675
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)	0.504672	0.000825	0.0001408	0.000225	0
	2,3,7,8-TCDD (pg/g)	<0.18 [U]	<0.14 [U]	<0.28 [U]	<0.21 [U]	<0.15 [U]
	1,2,3,7,8-PeCDD (pg/g)	0.33 [M,J,R]	<0.10 [U]	<0.20 [U]	<0.095 [U]	<0.084 [U]
	1,2,3,4,7,8-HxCDD (pg/g)	<0.27 [U]	<0.18 [U]	<0.29 [U]	<0.17 [U]	<0.19 [U]
	1,2,3,6,7,8-HxCDD (pg/g)	3.58	<0.16 [M,U]	<0.27 [U]	<0.15 [U]	<0.17 [U]
	1,2,3,7,8,9-HxCDD (pg/g)	1.00 [J,R]	<0.17 [M,U]	<0.28 [U]	<0.16 [U]	<0.18 [U]
	1,2,3,4,6,7,8-HpCDD (pg/g)	9.53	1.20 [M,J,R]	<0.25 [U]	0.23 [M,J]	<0.14 [U]
	OCDD (pg/g)	49.6	7.28	1.09 [J]	0.52 [M,J,R]	0.24 [M,J,R]
	Total-TCDD (pg/g)	<0.18 [U]	<0.14 [U]	<0.28 [U]	<0.21 [U]	<0.15 [U]
	Total TCDD # Homologues	0	0	0	0	0
	Total-PeCDD (pg/g)	<0.23 [U]	<0.10 [U]	<0.20 [U]	<0.095 [U]	<0.084 [U]

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1725545-12 SEDIMENT 17-JAN-16 SPLIT 1 (0-0.2)	L1725545-13 SEDIMENT 17-JAN-16 SPLIT 1 (0.2-0.4)	L1725545-14 SEDIMENT 17-JAN-16 SPLIT 1 (0.4-0.6)	L1725545-15 SEDIMENT 17-JAN-16 SPLIT 1 (0.6-0.8)	L1725545-16 SEDIMENT 17-JAN-16 SPLIT 1 (0.8-1.0)
SOIL						
Polycyclic	Fluoranthene (mg/kg)					
	Fluorene (mg/kg)					
	Indeno(1,2,3-c,d)pyrene (mg/kg)					
	Naphthalene (mg/kg)					
	Phenanthrene (mg/kg)					
	Pyrene (mg/kg)					
	Surrogate: Acenaphthene d10 (%)					
	Surrogate: Chrysene d12 (%)					
	Surrogate: Naphthalene d8 (%)					
	Surrogate: Phenanthrene d10 (%)					
	Total PAHs (mg/kg)					
Polychlorinated Biphenyls	Aroclor 1016 (mg/kg)					
	Aroclor 1221 (mg/kg)					
	Aroclor 1232 (mg/kg)					
	Aroclor 1242 (mg/kg)					
	Aroclor 1248 (mg/kg)					
	Aroclor 1254 (mg/kg)					
	Aroclor 1260 (mg/kg)					
	Aroclor 1262 (mg/kg)					
	Aroclor 1268 (mg/kg)					
	Surrogate: Decachlorobiphenyl (%)					
	Total PCBs (mg/kg)					
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)	1.182876	0.40159	0.462749	0.5385656	0.532653
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)	1.064226	0.204605	0.231514	0.2693046	0.2663265
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)	0.743076	0.00748	0.000117	0.0000436	0
	2,3,7,8-TCDD (pg/g)	0.18 M,J,R	<0.15 [U]	<0.18 [U]	<0.21 [U]	<0.20 [U]
	1,2,3,7,8-PeCDD (pg/g)	0.23 M,J	<0.11 [U]	<0.12 [U]	<0.13 [U]	<0.16 [U]
	1,2,3,4,7,8-HxCDD (pg/g)	<0.37 [U]	<0.12 [U]	<0.12 [U]	<0.18 [U]	<0.16 [U]
	1,2,3,6,7,8-HxCDD (pg/g)	2.94 [J]	<0.12 M,U	<0.12 [U]	<0.16 [U]	<0.15 [U]
	1,2,3,7,8,9-HxCDD (pg/g)	0.99 [J]	<0.12 [U]	<0.12 [U]	<0.17 [U]	<0.15 [U]
	1,2,3,4,6,7,8-HpCDD (pg/g)	9.83	1.75 [J]	0.13 M,J,R	<0.19 M,U	<0.14 [U]
	OCDD (pg/g)	59.5	10.2 [U]	1.17 M,J	0.44 [J]	<0.22 [U]
	Total-TCDD (pg/g)	<0.17 [U]	<0.15 [U]	<0.18 [U]	<0.21 [U]	<0.20 [U]
	Total TCDD # Homologues	0	0	0	0	0
	Total-PeCDD (pg/g)	0.91	<0.11 [U]	<0.12 [U]	<0.13 [U]	<0.16 [U]

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1725545-17	L1725545-18	L1725545-19	L1725545-20	L1725545-21
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	18-JAN-16	18-JAN-16	18-JAN-16	18-JAN-16	18-JAN-16
	Sampled Time	11:47	13:46	14:02	14:12	14:17
	Client ID	PCL18 (0-0.5)	PCL11 (0-0.5)	PCL11 (0.5-1.0)	PCL11 (1.0-1.5)	PCL11 (1.5-2.0)
Grouping	**Analyte**					
SOIL						
Polycyclic	Fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Fluorene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Naphthalene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Phenanthrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	
	Surrogate: Acenaphthene d10 (%)	66.3	74.0	72.0	105.1	
	Surrogate: Chrysene d12 (%)	99.7	94.5	97.8	98.2	
	Surrogate: Naphthalene d8 (%)	75.7	84.0	81.9	100.8	
	Surrogate: Phenanthrene d10 (%)	96.8	101.1	96.9	96.0	
	Total PAHs (mg/kg)	<0.20	<0.20	<0.20	<0.20	
Polychlorinated Biphenyls	Aroclor 1016 (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Aroclor 1221 (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Aroclor 1232 (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Aroclor 1242 (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Aroclor 1248 (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Aroclor 1254 (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Aroclor 1260 (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Aroclor 1262 (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Aroclor 1268 (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Surrogate: Decachlorobiphenyl (%)	89.4	90.5	99.8	98.7	
	Total PCBs (mg/kg)	<0.020	<0.020	<0.020	<0.020	
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)					
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)					
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)					
	2,3,7,8-TCDD (pg/g)					
	1,2,3,7,8-PeCDD (pg/g)					
	1,2,3,4,7,8-HxCDD (pg/g)					
	1,2,3,6,7,8-HxCDD (pg/g)					
	1,2,3,7,8,9-HxCDD (pg/g)					
	1,2,3,4,6,7,8-HpCDD (pg/g)					
	OCDD (pg/g)					
	Total-TCDD (pg/g)					
	Total TCDD # Homologues					
	Total-PeCDD (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1725545-22	L1725545-23	L1725545-24	L1725545-25	L1725545-26
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	18-JAN-16	18-JAN-16	18-JAN-16	18-JAN-16	18-JAN-16
	Sampled Time				12:30	12:37
	Client ID	SPLIT 2 (0-0.5)	SPLIT 2 (0.5-1.0)	SPLIT 2 (1.0-1.5)	PCS11 (0-0.2)	PCS11 (0.2-0.4)
Grouping	**Analyte**					
SOIL						
Polycyclic	Fluoranthene (mg/kg)	<0.050	<0.050	<0.050		
	Fluorene (mg/kg)	<0.050	<0.050	<0.050		
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050	<0.050		
	Naphthalene (mg/kg)	<0.050	<0.050	<0.050		
	Phenanthrene (mg/kg)	<0.050	<0.050	<0.050		
	Pyrene (mg/kg)	<0.050	<0.050	<0.050		
	Surrogate: Acenaphthene d10 (%)	81.6	86.0	91.2		
	Surrogate: Chrysene d12 (%)	98.1	94.5	110.0		
	Surrogate: Naphthalene d8 (%)	88.4	90.8	97.3		
	Surrogate: Phenanthrene d10 (%)	108.7	93.2	103.0		
	Total PAHs (mg/kg)	<0.20	<0.20	<0.20		
Polychlorinated Biphenyls	Aroclor 1016 (mg/kg)	<0.010	<0.010	<0.010		
	Aroclor 1221 (mg/kg)	<0.010	<0.010	<0.010		
	Aroclor 1232 (mg/kg)	<0.010	<0.010	<0.010		
	Aroclor 1242 (mg/kg)	<0.010	<0.010	<0.010		
	Aroclor 1248 (mg/kg)	<0.010	<0.010	<0.010		
	Aroclor 1254 (mg/kg)	<0.010	<0.010	<0.010		
	Aroclor 1260 (mg/kg)	<0.010	<0.010	<0.010		
	Aroclor 1262 (mg/kg)	<0.010	<0.010	<0.010		
	Aroclor 1268 (mg/kg)	<0.010	<0.010	<0.010		
	Surrogate: Decachlorobiphenyl (%)	112.6	106.5	102.8		
	Total PCBs (mg/kg)	<0.020	<0.020	<0.020		
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)				1.313583	1.110277
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)				1.055483	0.823577
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)				0.572683	0.321877
	2,3,7,8-TCDD (pg/g)				<0.23 [U]	<0.25 [U]
	1,2,3,7,8-PeCDD (pg/g)				0.22 M,J,R	0.20 M,J,R
	1,2,3,4,7,8-HxCDD (pg/g)				<0.41 [U]	<0.39 [U]
	1,2,3,6,7,8-HxCDD (pg/g)				2.29 [J]	2.37 [J]
	1,2,3,7,8,9-HxCDD (pg/g)				0.47 M,J,R	1.13 [J]
	1,2,3,4,6,7,8-HpCDD (pg/g)				7.19	5.63
	OCDD (pg/g)				50.5	24.5 [M]
	Total-TCDD (pg/g)				0.25	<0.25 [U]
	Total TCDD # Homologues				1	0
	Total-PeCDD (pg/g)				0.89	0.48

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1725545-27 SEDIMENT 18-JAN-16 12:40 PCS11 (0.4-0.6)	L1725545-28 SEDIMENT 18-JAN-16 12:51 PCS11 (0.6-0.8)	L1725545-29 SEDIMENT 18-JAN-16 13:18 PCS11 (0.8-1.0)	L1725545-33 SEDIMENT 18-JAN-16 16:13 PCL09 (0-0.5)	L1725545-34 SEDIMENT 18-JAN-16 16:17 PCL09 (0.5-1.0)
SOIL						
Polycyclic	Fluoranthene (mg/kg)				<0.050	<0.050
	Fluorene (mg/kg)				<0.050	<0.050
	Indeno(1,2,3-c,d)pyrene (mg/kg)				<0.050	<0.050
	Naphthalene (mg/kg)				<0.050	<0.050
	Phenanthrene (mg/kg)				<0.050	<0.050
	Pyrene (mg/kg)				<0.050	<0.050
	Surrogate: Acenaphthene d10 (%)				110.5	100.8
	Surrogate: Chrysene d12 (%)				99.0	97.8
	Surrogate: Naphthalene d8 (%)				102.1	101.5
	Surrogate: Phenanthrene d10 (%)				101.6	102.8
	Total PAHs (mg/kg)				<0.20	<0.20
Polychlorinated Biphenyls	Aroclor 1016 (mg/kg)				<0.010	<0.010
	Aroclor 1221 (mg/kg)				<0.010	<0.010
	Aroclor 1232 (mg/kg)				<0.010	<0.010
	Aroclor 1242 (mg/kg)				<0.010	<0.010
	Aroclor 1248 (mg/kg)				<0.010	<0.010
	Aroclor 1254 (mg/kg)				<0.010	<0.010
	Aroclor 1260 (mg/kg)				<0.010	<0.010
	Aroclor 1262 (mg/kg)				<0.010	<0.010
	Aroclor 1268 (mg/kg)				<0.010	<0.010
	Surrogate: Decachlorobiphenyl (%)				103.8	81.8
	Total PCBs (mg/kg)				<0.020	<0.020
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)	0.495651	0.716419	0.912506		
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)	0.273301	0.3582315	0.456286		
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)	0.050951	0	0		
	2,3,7,8-TCDD (pg/g)	<0.17 [U]	<0.29 [U]	<0.36 [U]		
	1,2,3,7,8-PeCDD (pg/g)	<0.099 [U]	<0.19 [U]	<0.24 [U]		
	1,2,3,4,7,8-HxCDD (pg/g)	<0.16 [U]	<0.19 [U]	<0.29 [U]		
	1,2,3,6,7,8-HxCDD (pg/g)	<0.15 M,U	<0.18 [U]	<0.26 [U]		
	1,2,3,7,8,9-HxCDD (pg/g)	<0.16 [U]	<0.18 [U]	<0.27 [U]		
	1,2,3,4,6,7,8-HpCDD (pg/g)	3.28 [J]	<0.15 [U]	<0.21 [U]		
	OCDD (pg/g)	20.7	0.44 M,J,R	0.43 M,J,R		
	Total-TCDD (pg/g)	0.95	<0.29 [U]	<0.36 [U]		
	Total TCDD # Homologues	2	0	0		
	Total-PeCDD (pg/g)	<0.099 [U]	<0.19 [U]	<0.24 [U]		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1725545-35	L1725545-36			
	Description	SEDIMENT	SEDIMENT			
	Sampled Date	18-JAN-16	18-JAN-16			
	Sampled Time	16:30	16:37			
	Client ID	PCL09 (1.0-1.5)	PCL09 (1.5-2.05)			
Grouping	**Analyte**					
SOIL						
Polycyclic	Fluoranthene (mg/kg)	<0.050				
	Fluorene (mg/kg)	<0.050				
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050				
	Naphthalene (mg/kg)	<0.050				
	Phenanthrene (mg/kg)	<0.050				
	Pyrene (mg/kg)	<0.050				
	Surrogate: Acenaphthene d10 (%)	94.6				
	Surrogate: Chrysene d12 (%)	96.7				
	Surrogate: Naphthalene d8 (%)	92.5				
	Surrogate: Phenanthrene d10 (%)	96.1				
	Total PAHs (mg/kg)	<0.20				
Polychlorinated Biphenyls	Aroclor 1016 (mg/kg)	<0.010				
	Aroclor 1221 (mg/kg)	<0.010				
	Aroclor 1232 (mg/kg)	<0.010				
	Aroclor 1242 (mg/kg)	<0.010				
	Aroclor 1248 (mg/kg)	<0.010				
	Aroclor 1254 (mg/kg)	<0.010				
	Aroclor 1260 (mg/kg)	<0.010				
	Aroclor 1262 (mg/kg)	<0.010				
	Aroclor 1268 (mg/kg)	<0.010				
	Surrogate: Decachlorobiphenyl (%)	98.4				
	Total PCBs (mg/kg)	<0.020				
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)					
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)					
	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)					
	2,3,7,8-TCDD (pg/g)					
	1,2,3,7,8-PeCDD (pg/g)					
	1,2,3,4,7,8-HxCDD (pg/g)					
	1,2,3,6,7,8-HxCDD (pg/g)					
	1,2,3,7,8,9-HxCDD (pg/g)					
	1,2,3,4,6,7,8-HpCDD (pg/g)					
	OCDD (pg/g)					
	Total-TCDD (pg/g)					
	Total TCDD # Homologues					
	Total-PeCDD (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1725545-1	L1725545-2	L1725545-3	L1725545-4	L1725545-5
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	17-JAN-16	17-JAN-16	17-JAN-16	17-JAN-16	17-JAN-16
	Sampled Time	15:43	15:07	15:13	15:22	15:30
	Client ID	PCL22 (0-0.4)	PCL24 (0-0.5)	PCL24 (0.5-1.0)	PCL24 (1.0-1.5)	PCL24 (1.5-2.0)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total PeCDD # Homologues					
	Total-HxCDD (pg/g)					
	Total HxCDD # Homologues					
	Total-HpCDD (pg/g)					
	Total HpCDD # Homologues					
	2,3,7,8-TCDF (pg/g)					
	1,2,3,7,8-PeCDF (pg/g)					
	2,3,4,7,8-PeCDF (pg/g)					
	1,2,3,4,7,8-HxCDF (pg/g)					
	1,2,3,6,7,8-HxCDF (pg/g)					
	1,2,3,7,8,9-HxCDF (pg/g)					
	2,3,4,6,7,8-HxCDF (pg/g)					
	1,2,3,4,6,7,8-HpCDF (pg/g)					
	1,2,3,4,7,8,9-HpCDF (pg/g)					
	OCDF (pg/g)					
	Total-TCDF (pg/g)					
	Total TCDF # Homologues					
	Total-PeCDF (pg/g)					
	Total PeCDF # Homologues					
	Total-HxCDF (pg/g)					
	Total HxCDF # Homologues					
	Total-HpCDF (pg/g)					
	Total HpCDF # Homologues					
	Surrogate: 13C12-2,3,7,8-TCDD (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)					
	Surrogate: 13C12-OCDD (%)					
	Surrogate: 13C12-2,3,7,8-TCDF (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)					
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)					
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1725545-6	L1725545-7	L1725545-8	L1725545-9	L1725545-10
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	17-JAN-16	17-JAN-16	17-JAN-16	17-JAN-16	17-JAN-16
Sampled Time	12:21	12:29	12:35	12:42	12:47
Client ID	PCS24 (0-0.2)	PCS24 (0.2-0.4)	PCS24 (0.4-0.6)	PCS24 (0.6-0.8)	PCS24 (0.8-1.0)
Grouping **Analyte**					
SOIL					
Dioxins and Furans Total PeCDD # Homologues	0	0	0	0	0
Total-HxCDD (pg/g)	25.3	0.26	<0.29 [U]	<0.17 [U]	<0.19 [U]
Total HxCDD # Homologues	4	1	0	0	0
Total-HpCDD (pg/g)	21.1	1.64	<0.25 [U]	0.23	<0.14 [U]
Total HpCDD # Homologues	2	1	0	1	0
2,3,7,8-TCDF (pg/g)	6.44	0.19 M,J,R	<0.23 [U]	<0.14 [U]	<0.12 [U]
1,2,3,7,8-PeCDF (pg/g)	<0.12 [U]	<0.10 [U]	<0.15 [U]	<0.12 [U]	<0.085 [U]
2,3,4,7,8-PeCDF (pg/g)	0.22 M,J	<0.086 [U]	<0.13 [U]	<0.11 [U]	<0.078 [U]
1,2,3,4,7,8-HxCDF (pg/g)	<0.17 M,U	<0.091 [U]	<0.13 [U]	<0.081 [U]	<0.078 [U]
1,2,3,6,7,8-HxCDF (pg/g)	<0.16 M,U	<0.086 [U]	<0.11 [U]	<0.080 [U]	<0.066 [U]
1,2,3,7,8,9-HxCDF (pg/g)	<0.23 [U]	<0.12 [U]	<0.18 [U]	<0.12 [U]	<0.11 [U]
2,3,4,6,7,8-HxCDF (pg/g)	<0.15 M,U	<0.087 [U]	<0.12 [U]	<0.076 [U]	<0.076 [U]
1,2,3,4,6,7,8-HpCDF (pg/g)	2.43 [J]	0.380 J,R	<0.13 [U]	<0.10 [U]	<0.068 [U]
1,2,3,4,7,8,9-HpCDF (pg/g)	<0.18 [U]	<0.11 [U]	<0.18 [U]	<0.17 [U]	<0.11 [U]
OCDF (pg/g)	5.82 M,J	0.97 [J]	0.32 M,J	0.33 M,J,R	<0.17 M,U
Total-TCDF (pg/g)	10.7	0.15	0.56	<0.14 [U]	<0.12 [U]
Total TCDF # Homologues	4	1	1	0	0
Total-PeCDF (pg/g)	0.46	<0.10 [U]	<0.15 [U]	<0.12 [U]	<0.085 [U]
Total PeCDF # Homologues	2	0	0	0	0
Total-HxCDF (pg/g)	3.03	<0.12 [U]	<0.18 [U]	<0.12 [U]	<0.11 [U]
Total HxCDF # Homologues	3	0	0	0	0
Total-HpCDF (pg/g)	7.06	<0.11 [U]	<0.18 [U]	<0.17 [U]	<0.11 [U]
Total HpCDF # Homologues	2	0	0	0	0
Surrogate: 13C12-2,3,7,8-TCDD (%)	76.0	78.0	68.0	76.0	72.0
Surrogate: 13C12-1,2,3,7,8-PeCDD (%)	71.0	69.0	58.0	64.0	63.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)	95.0	91.0	88.0	96.0	85.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)	110.0	105.0	113.0	117.0	102.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)	105.0	103.0	102.0	99.0	93.0
Surrogate: 13C12-OCDD (%)	99.0	95.0	93.0	89.0	85.0
Surrogate: 13C12-2,3,7,8-TCDF (%)	80.0	79.0	70.0	80.0	76.0
Surrogate: 13C12-1,2,3,7,8-PeCDF (%)	74.0	73.0	64.0	69.0	68.0
Surrogate: 13C12-2,3,4,7,8-PeCDF (%)	72.0	73.0	62.0	69.0	65.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)	98.0	95.0	98.0	105.0	89.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)	112.0	108.0	114.0	114.0	101.0
Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)	109.0	102.0	103.0	111.0	97.0
Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)	98.0	90.0	83.0	95.0	86.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)	113.0	103.0	106.0	118.0	100.0

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1725545-12	L1725545-13	L1725545-14	L1725545-15	L1725545-16
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	17-JAN-16	17-JAN-16	17-JAN-16	17-JAN-16	17-JAN-16
Sampled Time					
Client ID	SPLIT 1 (0-0.2)	SPLIT 1 (0.2-0.4)	SPLIT 1 (0.4-0.6)	SPLIT 1 (0.6-0.8)	SPLIT 1 (0.8-1.0)
Grouping / **Analyte**					
SOIL					
Dioxins and Furans					
Total PeCDD # Homologues	3	0	0	0	0
Total-HxCDD (pg/g)	21.8	<0.12 [U]	<0.12 [U]	<0.18 [U]	<0.16 [U]
Total HxCDD # Homologues	4	0	0	0	0
Total-HpCDD (pg/g)	20.6	1.75	<0.12 [U]	<0.19 [U]	<0.14 [U]
Total HpCDD # Homologues	2	1	0	0	0
2,3,7,8-TCDF (pg/g)	6.65	<0.12 M,U	<0.15 [U]	<0.19 [U]	<0.17 [U]
1,2,3,7,8-PeCDF (pg/g)	0.110 M,J,R	<0.084 [U]	<0.12 [U]	<0.11 [U]	<0.096 [U]
2,3,4,7,8-PeCDF (pg/g)	0.208 [J]	<0.072 [U]	<0.11 [U]	<0.10 [U]	<0.086 [U]
1,2,3,4,7,8-HxCDF (pg/g)	<0.15 [U]	<0.059 [U]	<0.069 [U]	<0.086 [U]	<0.075 [U]
1,2,3,6,7,8-HxCDF (pg/g)	<0.14 [U]	<0.055 [U]	<0.064 [U]	<0.077 [U]	<0.067 [U]
1,2,3,7,8,9-HxCDF (pg/g)	<0.22 [U]	<0.079 M,U	<0.096 [U]	<0.13 [U]	<0.10 [U]
2,3,4,6,7,8-HxCDF (pg/g)	0.17 J,R	<0.052 [U]	<0.069 [U]	<0.088 [U]	<0.067 [U]
1,2,3,4,6,7,8-HpCDF (pg/g)	2.49 [J]	0.471 [J]	<0.067 [U]	<0.071 [U]	<0.087 [U]
1,2,3,4,7,8,9-HpCDF (pg/g)	<0.13 [U]	<0.087 [U]	<0.11 [U]	<0.12 [U]	<0.14 [U]
OCDF (pg/g)	6.06 [J]	1.40 J,R	0.32 M,J,R	<0.22 M,U	<0.21 [U]
Total-TCDF (pg/g)	11.1	0.13	<0.15 [U]	0.41	<0.17 [U]
Total TCDF # Homologues	5	1	0	1	0
Total-PeCDF (pg/g)	1.62	<0.084 [U]	<0.12 [U]	<0.11 [U]	<0.096 [U]
Total PeCDF # Homologues	3	0	0	0	0
Total-HxCDF (pg/g)	3.33	<0.079 [U]	<0.096 [U]	<0.13 [U]	<0.10 [U]
Total HxCDF # Homologues	2	0	0	0	0
Total-HpCDF (pg/g)	7.21	1.38	<0.11 [U]	<0.12 [U]	<0.14 [U]
Total HpCDF # Homologues	2	2	0	0	0
Surrogate: 13C12-2,3,7,8-TCDD (%)	76.0	73.0	71.0	65.0	66.0
Surrogate: 13C12-1,2,3,7,8-PeCDD (%)	79.0	70.0	61.0	56.0	54.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)	83.0	88.0	97.0	79.0	79.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)	106.0	104.0	105.0	102.0	100.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)	100.0	100.0	98.0	87.0	87.0
Surrogate: 13C12-OCDD (%)	88.0	95.0	91.0	79.0	78.0
Surrogate: 13C12-2,3,7,8-TCDF (%)	78.0	77.0	76.0	68.0	69.0
Surrogate: 13C12-1,2,3,7,8-PeCDF (%)	79.0	74.0	67.0	62.0	59.0
Surrogate: 13C12-2,3,4,7,8-PeCDF (%)	80.0	74.0	66.0	61.0	57.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)	92.0	89.0	105.0	86.0	85.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)	109.0	104.0	111.0	103.0	102.0
Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)	104.0	101.0	104.0	90.0	92.0
Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)	89.0	90.0	93.0	81.0	81.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)	102.0	108.0	118.0	99.0	97.0

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1725545-17	L1725545-18	L1725545-19	L1725545-20	L1725545-21
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	18-JAN-16	18-JAN-16	18-JAN-16	18-JAN-16	18-JAN-16
	Sampled Time	11:47	13:46	14:02	14:12	14:17
	Client ID	PCL18 (0-0.5)	PCL11 (0-0.5)	PCL11 (0.5-1.0)	PCL11 (1.0-1.5)	PCL11 (1.5-2.0)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total PeCDD # Homologues					
	Total-HxCDD (pg/g)					
	Total HxCDD # Homologues					
	Total-HpCDD (pg/g)					
	Total HpCDD # Homologues					
	2,3,7,8-TCDF (pg/g)					
	1,2,3,7,8-PeCDF (pg/g)					
	2,3,4,7,8-PeCDF (pg/g)					
	1,2,3,4,7,8-HxCDF (pg/g)					
	1,2,3,6,7,8-HxCDF (pg/g)					
	1,2,3,7,8,9-HxCDF (pg/g)					
	2,3,4,6,7,8-HxCDF (pg/g)					
	1,2,3,4,6,7,8-HpCDF (pg/g)					
	1,2,3,4,7,8,9-HpCDF (pg/g)					
	OCDF (pg/g)					
	Total-TCDF (pg/g)					
	Total TCDF # Homologues					
	Total-PeCDF (pg/g)					
	Total PeCDF # Homologues					
	Total-HxCDF (pg/g)					
	Total HxCDF # Homologues					
	Total-HpCDF (pg/g)					
	Total HpCDF # Homologues					
	Surrogate: 13C12-2,3,7,8-TCDD (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)					
	Surrogate: 13C12-OCDD (%)					
	Surrogate: 13C12-2,3,7,8-TCDF (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)					
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)					
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1725545-22	L1725545-23	L1725545-24	L1725545-25	L1725545-26
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	18-JAN-16	18-JAN-16	18-JAN-16	18-JAN-16	18-JAN-16
Sampled Time				12:30	12:37
Client ID	SPLIT 2 (0-0.5)	SPLIT 2 (0.5-1.0)	SPLIT 2 (1.0-1.5)	PCS11 (0-0.2)	PCS11 (0.2-0.4)
Grouping **Analyte**					
SOIL					
Dioxins and Furans Total PeCDD # Homologues				2	1
Total-HxCDD (pg/g)				13.5	19.5
Total HxCDD # Homologues				2	3
Total-HpCDD (pg/g)				17.0	11.3
Total HpCDD # Homologues				2	2
2,3,7,8-TCDF (pg/g)				7.45 [M]	5.57 [M]
1,2,3,7,8-PeCDF (pg/g)				<0.15 [U]	<0.15 [U]
2,3,4,7,8-PeCDF (pg/g)				0.29 [M,J]	<0.13 [U]
1,2,3,4,7,8-HxCDF (pg/g)				<0.17 [U]	<0.12 [U]
1,2,3,6,7,8-HxCDF (pg/g)				<0.16 [U]	<0.12 [U]
1,2,3,7,8,9-HxCDF (pg/g)				<0.23 [U]	<0.18 [U]
2,3,4,6,7,8-HxCDF (pg/g)				<0.16 [M,U]	<0.12 [U]
1,2,3,4,6,7,8-HpCDF (pg/g)				2.00 [M,J]	1.50 [J,R]
1,2,3,4,7,8,9-HpCDF (pg/g)				<0.17 [U]	<0.19 [U]
OCDF (pg/g)				5.43 [J]	2.97 [J]
Total-TCDF (pg/g)				13.5	10.3
Total TCDF # Homologues				5	5
Total-PeCDF (pg/g)				0.99	<0.15 [U]
Total PeCDF # Homologues				3	0
Total-HxCDF (pg/g)				2.51	<0.18 [U]
Total HxCDF # Homologues				2	0
Total-HpCDF (pg/g)				5.85	<0.19 [U]
Total HpCDF # Homologues				2	0
Surrogate: 13C12-2,3,7,8-TCDD (%)				69.0	69.0
Surrogate: 13C12-1,2,3,7,8-PeCDD (%)				59.0	60.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)				96.0	94.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)				110.0	113.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)				98.0	101.0
Surrogate: 13C12-OCDD (%)				79.0	79.0
Surrogate: 13C12-2,3,7,8-TCDF (%)				73.0	73.0
Surrogate: 13C12-1,2,3,7,8-PeCDF (%)				65.0	66.0
Surrogate: 13C12-2,3,4,7,8-PeCDF (%)				62.0	64.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)				96.0	100.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)				110.0	112.0
Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)				102.0	107.0
Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)				93.0	95.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)				113.0	110.0

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1725545-27	L1725545-28	L1725545-29	L1725545-33	L1725545-34
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	18-JAN-16	18-JAN-16	18-JAN-16	18-JAN-16	18-JAN-16
	Sampled Time	12:40	12:51	13:18	16:13	16:17
	Client ID	PCS11 (0.4-0.6)	PCS11 (0.6-0.8)	PCS11 (0.8-1.0)	PCL09 (0-0.5)	PCL09 (0.5-1.0)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total PeCDD # Homologues	0	0	0		
	Total-HxCDD (pg/g)	0.92	<0.19 [U]	<0.29 [U]		
	Total HxCDD # Homologues	2	0	0		
	Total-HpCDD (pg/g)	3.28	<0.15 [U]	<0.21 [U]		
	Total HpCDD # Homologues	1	0	0		
	2,3,7,8-TCDF (pg/g)	0.74 [J]	<0.22 [U]	<0.26 [U]		
	1,2,3,7,8-PeCDF (pg/g)	<0.098 [U]	<0.16 [U]	<0.19 [U]		
	2,3,4,7,8-PeCDF (pg/g)	<0.089 [U]	<0.15 [U]	<0.16 [U]		
	1,2,3,4,7,8-HxCDF (pg/g)	<0.092 [U]	<0.094 [U]	<0.13 [U]		
	1,2,3,6,7,8-HxCDF (pg/g)	<0.093 [U]	<0.091 [U]	<0.13 [U]		
	1,2,3,7,8,9-HxCDF (pg/g)	<0.14 [U]	<0.14 [U]	<0.19 [U]		
	2,3,4,6,7,8-HxCDF (pg/g)	<0.093 [U]	<0.092 [U]	<0.12 [U]		
	1,2,3,4,6,7,8-HpCDF (pg/g)	0.839 [J]	<0.070 [U]	<0.093 [U]		
	1,2,3,4,7,8,9-HpCDF (pg/g)	<0.14 [U]	<0.12 [U]	<0.15 [U]		
	OCDF (pg/g)	2.11 [J]	<0.25 M,U	0.23 M,J,R		
	Total-TCDF (pg/g)	2.63	0.66	<0.26 [U]		
	Total TCDF # Homologues	5	1	0		
	Total-PeCDF (pg/g)	<0.098 [U]	<0.16 [U]	<0.19 [U]		
	Total PeCDF # Homologues	0	0	0		
	Total-HxCDF (pg/g)	<0.14 [U]	<0.14 [U]	<0.19 [U]		
	Total HxCDF # Homologues	0	0	0		
	Total-HpCDF (pg/g)	0.84	<0.12 [U]	<0.15 [U]		
	Total HpCDF # Homologues	1	0	0		
	Surrogate: 13C12-2,3,7,8-TCDD (%)	65.0	65.0	64.0		
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)	50.0	53.0	56.0		
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)	87.0	93.0	95.0		
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)	101.0	101.0	114.0		
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)	89.0	109.0	115.0		
	Surrogate: 13C12-OCDD (%)	80.0	89.0	104.0		
	Surrogate: 13C12-2,3,7,8-TCDF (%)	73.0	67.0	68.0		
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)	56.0	58.0	63.0		
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)	55.0	56.0	61.0		
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)	91.0	95.0	95.0		
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)	103.0	106.0	111.0		
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)	95.0	97.0	107.0		
	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)	86.0	82.0	83.0		
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)	104.0	124.0	123.0		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1725545-35	L1725545-36			
	Description	SEDIMENT	SEDIMENT			
	Sampled Date	18-JAN-16	18-JAN-16			
	Sampled Time	16:30	16:37			
	Client ID	PCL09 (1.0-1.5)	PCL09 (1.5-2.05)			
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Total PeCDD # Homologues					
	Total-HxCDD (pg/g)					
	Total HxCDD # Homologues					
	Total-HpCDD (pg/g)					
	Total HpCDD # Homologues					
	2,3,7,8-TCDF (pg/g)					
	1,2,3,7,8-PeCDF (pg/g)					
	2,3,4,7,8-PeCDF (pg/g)					
	1,2,3,4,7,8-HxCDF (pg/g)					
	1,2,3,6,7,8-HxCDF (pg/g)					
	1,2,3,7,8,9-HxCDF (pg/g)					
	2,3,4,6,7,8-HxCDF (pg/g)					
	1,2,3,4,6,7,8-HpCDF (pg/g)					
	1,2,3,4,7,8,9-HpCDF (pg/g)					
	OCDF (pg/g)					
	Total-TCDF (pg/g)					
	Total TCDF # Homologues					
	Total-PeCDF (pg/g)					
	Total PeCDF # Homologues					
	Total-HxCDF (pg/g)					
	Total HxCDF # Homologues					
	Total-HpCDF (pg/g)					
	Total HpCDF # Homologues					
	Surrogate: 13C12-2,3,7,8-TCDD (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)					
	Surrogate: 13C12-OCDD (%)					
	Surrogate: 13C12-2,3,7,8-TCDF (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)					
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)					
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1725545-1	L1725545-2	L1725545-3	L1725545-4	L1725545-5
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	17-JAN-16	17-JAN-16	17-JAN-16	17-JAN-16	17-JAN-16
	Sampled Time	15:43	15:07	15:13	15:22	15:30
	Client ID	PCL22 (0-0.4)	PCL24 (0-0.5)	PCL24 (0.5-1.0)	PCL24 (1.0-1.5)	PCL24 (1.5-2.0)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)					
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)					
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)					
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)					
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1725545-6	L1725545-7	L1725545-8	L1725545-9	L1725545-10
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	17-JAN-16	17-JAN-16	17-JAN-16	17-JAN-16	17-JAN-16
	Sampled Time	12:21	12:29	12:35	12:42	12:47
	Client ID	PCS24 (0-0.2)	PCS24 (0.2-0.4)	PCS24 (0.4-0.6)	PCS24 (0.6-0.8)	PCS24 (0.8-1.0)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)	108.0	109.0	102.0	107.0	93.0
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)	68.0	71.0	62.0	68.0	64.0
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)	1.20	0.00248	0.000422	0.00225	0.00
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)	1.77	0.217	0.345	0.224	0.181
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)	1.92	0.397	0.691	0.445	0.362

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1725545-12	L1725545-13	L1725545-14	L1725545-15	L1725545-16
Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sampled Date	17-JAN-16	17-JAN-16	17-JAN-16	17-JAN-16	17-JAN-16
Sampled Time					
Client ID	SPLIT 1 (0-0.2)	SPLIT 1 (0.2-0.4)	SPLIT 1 (0.4-0.6)	SPLIT 1 (0.6-0.8)	SPLIT 1 (0.8-1.0)
Grouping **Analyte**					
SOIL					
Dioxins and Furans Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)	102.0	106.0	108.0	92.0	92.0
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)	69.0	63.0	68.0	69.0	52.0
Toxic Equivalency Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)	1.49	0.0253	0.000351	0.000131	0.00
Mid Point PCDD/F TEQ (WHO 2005) (pg/g)	1.73	0.204	0.211	0.243	0.243
Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)	1.78	0.383	0.421	0.485	0.486

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1725545-17	L1725545-18	L1725545-19	L1725545-20	L1725545-21
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	18-JAN-16	18-JAN-16	18-JAN-16	18-JAN-16	18-JAN-16
	Sampled Time	11:47	13:46	14:02	14:12	14:17
	Client ID	PCL18 (0-0.5)	PCL11 (0-0.5)	PCL11 (0.5-1.0)	PCL11 (1.0-1.5)	PCL11 (1.5-2.0)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)					
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)					
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)					
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)					
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1725545-22 SEDIMENT 18-JAN-16 SPLIT 2 (0-0.5)	L1725545-23 SEDIMENT 18-JAN-16 SPLIT 2 (0.5-1.0)	L1725545-24 SEDIMENT 18-JAN-16 SPLIT 2 (1.0-1.5)	L1725545-25 SEDIMENT 18-JAN-16 12:30 PCS11 (0-0.2)	L1725545-26 SEDIMENT 18-JAN-16 12:37 PCS11 (0.2-0.4)
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)				100.0	100.0
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)				64.0	65.0
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)				1.17	0.972
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)				1.61	1.38
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)				1.79	1.57

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1725545-27	L1725545-28	L1725545-29	L1725545-33	L1725545-34
	Description	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
	Sampled Date	18-JAN-16	18-JAN-16	18-JAN-16	18-JAN-16	18-JAN-16
	Sampled Time	12:40	12:51	13:18	16:13	16:17
	Client ID	PCS11 (0.4-0.6)	PCS11 (0.6-0.8)	PCS11 (0.8-1.0)	PCL09 (0-0.5)	PCL09 (0.5-1.0)
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)	91.0	111.0	110.0		
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)	59.0	64.0	62.0		
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.122	0.00	0.00		
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)	0.316	0.326	0.412		
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.511	0.652	0.823		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1725545-35	L1725545-36			
	Description	SEDIMENT	SEDIMENT			
	Sampled Date	18-JAN-16	18-JAN-16			
	Sampled Time	16:30	16:37			
	Client ID	PCL09 (1.0-1.5)	PCL09 (1.5-2.05)			
Grouping	**Analyte**					
SOIL						
Dioxins and Furans	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)					
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)					
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)					
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)					
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Total-HpCDD	A	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Duplicate	Acenaphthene	DLCI	L1725545-1, -17, -18, -19, -2, -20, -22, -23, -24, -3, -33, -34, -35, -4
Duplicate	Acenaphthylene	DLCI	L1725545-1, -17, -18, -19, -2, -20, -22, -23, -24, -3, -33, -34, -35, -4
Duplicate	Benz(a)anthracene	DLCI	L1725545-1, -17, -18, -19, -2, -20, -22, -23, -24, -3, -33, -34, -35, -4
Duplicate	Benzo(a)pyrene	DLCI	L1725545-1, -17, -18, -19, -2, -20, -22, -23, -24, -3, -33, -34, -35, -4
Duplicate	Benzo(b)fluoranthene	DLCI	L1725545-1, -17, -18, -19, -2, -20, -22, -23, -24, -3, -33, -34, -35, -4
Duplicate	Benzo(g,h,i)perylene	DLCI	L1725545-1, -17, -18, -19, -2, -20, -22, -23, -24, -3, -33, -34, -35, -4
Duplicate	Benzo(k)fluoranthene	DLCI	L1725545-1, -17, -18, -19, -2, -20, -22, -23, -24, -3, -33, -34, -35, -4
Duplicate	Chrysene	DLCI	L1725545-1, -17, -18, -19, -2, -20, -22, -23, -24, -3, -33, -34, -35, -4
Duplicate	Dibenz(a,h)anthracene	DLCI	L1725545-1, -17, -18, -19, -2, -20, -22, -23, -24, -3, -33, -34, -35, -4
Duplicate	Fluorene	DLCI	L1725545-1, -17, -18, -19, -2, -20, -22, -23, -24, -3, -33, -34, -35, -4
Duplicate	Indeno(1,2,3-c,d)pyrene	DLCI	L1725545-1, -17, -18, -19, -2, -20, -22, -23, -24, -3, -33, -34, -35, -4
Duplicate	Naphthalene	DLCI	L1725545-1, -17, -18, -19, -2, -20, -22, -23, -24, -3, -33, -34, -35, -4
Method Blank	1,2,3,4,6,7,8-HpCDF	M,U	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	1,2,3,7,8,9-HxCDF	M,U	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	1,2,3,4,6,7,8-HpCDD	[U]	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	1,2,3,4,7,8,9-HpCDF	[U]	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	1,2,3,4,7,8-HxCDD	[U]	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	1,2,3,4,7,8-HxCDF	[U]	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	1,2,3,6,7,8-HxCDD	[U]	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	1,2,3,6,7,8-HxCDF	[U]	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	1,2,3,7,8,9-HxCDD	[U]	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits.		

Reference Information

	Parameter	Qualifier	Applies to Sample Number(s)
	Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	1,2,3,7,8-PeCDD	[U]	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	1,2,3,7,8-PeCDF	[U]	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	2,3,4,6,7,8-HxCDF	[U]	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	2,3,4,7,8-PeCDF	[U]	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	2,3,7,8-TCDD	[U]	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	2,3,7,8-TCDF	[U]	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	OCDD	[U]	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	OCDF	[U]	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	Total-HpCDF	[U]	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	Total-HxCDD	[U]	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	Total-HxCDF	[U]	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	Total-PeCDD	[U]	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	Total-PeCDF	[U]	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	Total-TCDD	[U]	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		
Method Blank	Total-TCDF	[U]	L1725545-10, -12, -13, -14, -15, -16, -25, -26, -27, -28, -29, -6, -7, -8, -9
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration		

Qualifiers for Individual Parameters Listed:

Reference Information

Qualifier	Description
A	Method Blank exceeds ALS DQO. Refer to narrative comments for further information.
DLCI	Detection Limit Raised: Chromatographic Interference due to co-elution.
J,R	The analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,J	A peak has been manually integrated, and the analyte was detected below the calibrated range but above the EDL.
M,J,R	A peak has been manually integrated, the analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,U	A peak has been manually integrated, and the analyte was not detected above the EDL.
[J]	The analyte was detected below the calibrated range but above the EDL.
[U]	The analyte was not detected above the EDL.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-TOT-ORG-LECO-SK	Soil	Organic Carbon by combustion method	SSSA (1996) p. 973

Total Organic Carbon (C-TOT-ORG-LECO-SK, C-TOT-ORG-SK)

Total C and inorganic C are determined on separate samples. The total C is determined by combustion and thermal conductivity detection, while inorganic C is determined by weight lass after addition of hydrochloric acid. Organic C is calculated by the difference between these two determinations.

Reference for Total C:
Nelson, D.W. and Sommers, L.E. 1996. Total Carbon, organic carbon and organic matter. P. 961-1010 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

Reference for Inorganic C:
Loeppert, R.H. and Suarez, D.L. 1996. Gravimetric Method for Loss of Carbon Dioxide. P. 455-456 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

CL-PASTE-COLOR-VA	Soil	Chloride in Soil (Paste) by Colourimetry	Carter-CSSS / APHA 4500-Cl E (modified)

A soil extract produced by the saturated paste extraction procedure is analyzed for chloride by ferricyanide colourimetry.

DX-1613B-HRMS-BU	Soil	Dioxins and Furans HR 1613B	USEPA 1613B

Samples are extracted by Soxhlet. The extracts are prepared using column chromatography, reduced in volume and analyzed by isotope-dilution GC/HRMS

HG-200.2-CVAF-VA	Soil	Mercury in Soil by CVAFS	EPA 200.2/1631E (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAFS.

MET-200.2-CCMS-VA	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample matrix, for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V.

MET-PASTE-ICP-VA	Soil	Metals in Soil (Paste) by ICPOES	Carter-CSSS / EPA 6010B (modified)

A soil extract produced by the saturated paste extraction procedure is analyzed for Sodium, Calcium, and Magnesium by ICPOES as per "Soil Sampling and Methods of Analysis" by M. Carter.

MOIST-SK	Soil	Moisture Content	ASTM D2216-80

The weighed portion of soil is placed in a 105°C oven overnight. The dried soil is allowed to cooled to room temperature, weighed and the % moisture is calculated.

Reference: ASTM D2216-80

MOISTURE-BU	Soil	% Moisture	ASTM METHOD D2974-00
MOISTURE-VA	Soil	Moisture content	ASTM D2974-00 Method A

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

PAH-SUM-CALC-VA	Soil	Sum of PAH's	CALCULATION

Total PAH represents the sum of all PAH analytes reported for a given sample. Note that regulatory agencies and criteria differ in their definitions of

Reference Information

Total PAH in terms of the individual PAH analytes to be included.

PAH-TMB-H/A-MS-VA	Soil	PAH - Rotary Extraction (Hexane/Acetone)	EPA 3570/8270

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3570 & 8270, published by the United States Environmental Protection Agency (EPA). The procedure uses a mechanical shaking technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene. The final extract is analysed by capillary column gas chromatography with mass spectrometric detection (GC/MS). Surrogate recoveries may not be reported in cases where interferences from the sample matrix prevent accurate quantitation. Because the two isomers cannot be readily chromatographically separated, benzo(j)fluoranthene is reported as part of the benzo(b)fluoranthene parameter.

PCB-ED	Soil	PCBs	EPA 3570/8082-GC-ECD
PSA-PIPET-DETAIL-SK	Soil	Particle size - Sieve and Pipette	SSIR-51 METHOD 3.2.1

Particle size distribution is determined by a combination of techniques. Dry sieving is performed for coarse particles, wet sieving for sand particles and the pipette sedimentation method for clay particles.

Reference:

Burt, R. (2009). Soil Survey Field and Laboratory Methods Manual. Soil Survey Investigations Report No. 5. Method 3.2.1.2.2. United States Department of Agriculture Natural Resources Conservation Service.

SAT-PCNT-VA	Soil	Saturation Percentage	Carter-CSSS

Saturation Percentage (SP) is the total volume of water present in a saturated paste (in mL) divided by the dry weight of the sample (in grams), expressed as a percentage, as described in "Soil Sampling and Methods of Analysis" by M. Carter.

WHO1998-FISH-EDL-BU	Soil	WHO1998Toxic Equivalency-Fish ND=EDL	Calculation
WHO1998-FISH-HALF-BU	Soil	WHO1998Toxic Equivalency-Fish ND=1/2EDL	Calculation
WHO1998-FISH-ZERO-BU	Soil	WHO1998Toxic Equivalency-Fish ND=0	Calculation

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA
BU	ALS ENVIRONMENTAL - BURLINGTON, ONTARIO, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # N/A

Report To		Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company:	Stantec Consulting Ltd.	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Molly Brewis	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400A-2261 Keating Cross Road	Email 1: molly.brewis@stantec.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saanichton, BC V8M 2A5	Email 2: karen.munro@stantec.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-858-9969 Fax: 250-544-1105	Email 3: stefan.dick@stantec.com	
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information	Analysis Request
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 123220054 task 225.101	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #:	
Lab Work Order # (lab use only)		ALS Contact: Brent Mack	Sampler: MB & PW

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-OD-200.2-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU		Archive			Number of Containers
	PCL22 (0-0.4)	17-Jan-16	15:43	SEDIMENT	X	X	X	X	X	X	X						3
	PCL24 (0-0.5)	17-Jan-16	15:07	SEDIMENT	X	X	X	X	X	X	X						3
	PCL24 (0.5-1.0)	17-Jan-16	15:13	SEDIMENT	X	X	X	X	X	X	X						3
	PCL24 (1.0-1.5)	17-Jan-16	15:22	SEDIMENT	X	X	X	X	X	X	X						3
	PCL24 (1.5-2.0)	17-Jan-16	15:30	SEDIMENT				X	X					X			2
	PCS24 (0-0.2)	17-Jan-16	12:21	SEDIMENT				X	X	X		X					2
	PCS24 (0.2-0.4)	17-Jan-16	12:29	SEDIMENT				X	X	X		X					2
	PCS24 (0.4-0.6)	17-Jan-16	12:35	SEDIMENT				X	X	X		X					2
	PCS24 (0.6-0.8)	17-Jan-16	12:42	SEDIMENT				X	X	X		X					2
	PCS24 (0.8-1.0)	17-Jan-16	12:47	SEDIMENT				X	X	X		X					2
	PCS24 (1.0-1.2)	17-Jan-16	12:57	SEDIMENT										X			2

L1725545-COFC

Special Instructions / Regulations with water ... ommercial/AB Tier 1 - Natural, etc) / Hazardous Details

Detailed breakdown of particle size for clay and silt fractions. Dioxins and Furans to be reported with WHO 1998 fish TEQs. Some samples for analysis AND archival. Archived samples to be held for 6 months.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by: Molly Brewis	Date (dd-mmm-yy): 19-Jan-16	Time (hh-mm): 7:00	Received by: Jean	Date: JAN 20	Time: 13:50	Temperature: 2,3,4 °C	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF

Via MR SPEEDY COURIER

ALS Environmental

Chain of Custod
Canada To
ww

L1725545-COFC

COC # N/A

Report To		Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company:	Stantec Consulting Ltd.	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Molly Brewis	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400A-2261 Keating Cross Road	Email 1: molly.brewis@stantec.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saanichton, BC V8M 2A5	Email 2: karen.munro@stantec.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-858-9969 Fax: 250-544-1105	Email 3: stefan.dick@stantec.com	
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information	Analysis Request
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 123220054 task 225.101	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #:	
Lab Work Order # (lab use only)		ALS Contact: Brent Mack	Sampler: MB & PW

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-OD-200.2-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU		Archive			Number of Containers
	Split 1 (0-0.2)	17-Jan-16		SEDIMENT				X	X	X		X					2
	Split 1 (0.2-0.4)	17-Jan-16		SEDIMENT				X	X	X		X					2
	Split 1 (0.4-0.6)	17-Jan-16		SEDIMENT				X	X	X		X					2
	Split 1 (0.6-0.8)	17-Jan-16		SEDIMENT				X	X	X		X					2
	Split 1 (0.8-1.0)	17-Jan-16		SEDIMENT				X	X	X		X					2
	PCL18 (0-0.5)	18-Jan-16	11:47	SEDIMENT	X	X	X	X	X	X	X						3
	PCL11 (0-0.5)	18-Jan-16	13:46	SEDIMENT	X	X	X	X	X	X	X						3
	PCL11 (0.5-1.0)	18-Jan-16	14:02	SEDIMENT	X	X	X	X	X	X	X						3
	PCL11 (1.0-1.5)	18-Jan-16	14:12	SEDIMENT	X	X	X	X	X	X	X						3
	PCL11 (1.5-2.0)	18-Jan-16	14:17	SEDIMENT				X	X					X			2
	Split 2 (0-0.5)	18-Jan-16		SEDIMENT	X	X	X	X	X	X	X						2
	Split 2 (0.5-1.0)	18-Jan-16		SEDIMENT	X	X	X	X	X	X	X						2
	Split 2 (1.0-1.5)	18-Jan-16		SEDIMENT	X	X	X	X	X	X	X						2

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Detailed breakdown of particle size for clay and silt fractions. Dioxins and Furans to be reported with WHO 1998 fish TEQs. Some samples for analysis AND archival. Archived samples to be held for 6 months.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Molly Brewis	19-Jan-16	7:00	Jan	20 Jan	13:50	2.34 °C				

ALS Environmental

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Canada Toll Free: 1
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L1725545-COFC

COC # N/A

Page 3 of 3

Report To				Report Format / Distribution				(one analysis subject to availability)
Company:	Stantec Consulting Ltd.			☑ Standard	☐ Other			◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Molly Brewis			☑ PDF	☑ Excel	☐ Digital	☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400A-2261 Keating Cross Road			Email 1:	molly.brewis@stantec.com			○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saanichton, BC V8M 2A5			Email 2:	karen.munro@stantec.com			○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-858-9969	Fax:	250-544-1105	Email 3:	stefan.dick@stantec.com			**Analysis Request**
Invoice To	Same as Report ?	☑ Yes	☐ No	**Client / Project Information**				Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?		☑ Yes	☐ No	Job #:	123220054 task 225.101			
Company:				PO / AFE:				
Contact:				LSD:				
Address:								
Phone:		Fax:		Quote #:				
Lab Work Order # (lab use only)				**ALS Contact:**	Brent Mack	**Sampler:**	MB & PW	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-OD-200.2-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU		Archive			Number of Containers
	PCS11 (0-0.2)	18-Jan-16	12:30	SEDIMENT				X	X	X		X					2
	PCS11 (0.2-0.4)	18-Jan-16	12:37	SEDIMENT				X	X	X		X					2
	PSC11 (0.4-0.6)	18-Jan-16	12:40	SEDIMENT				X	X	X		X					2
	PCS11 (0.6-0.8)	18-Jan-16	12:51	SEDIMENT				X	X	X		X					2
	PCS11 (0.8-1.0)	18-Jan-16	13:18	SEDIMENT				X	X	X		X					2
	PCS11 (1.0-1.2)	18-Jan-16	13:22	SEDIMENT										X			2
	PCS11 (1.2-1.32)	18-Jan-16	13:33	SEDIMENT										X			2
	PCS11 (1.32-1.57)	18-Jan-16	13:38	SEDIMENT										X			2
	PCL09 (0-0.5)	18-Jan-16	16:13	SEDIMENT	X	X	X	X	X	X	X						3
	PCL09 (0.5-1.0)	18-Jan-16	16:17	SEDIMENT	X	X	X	X	X	X	X						3
	PCL09 (1.0-1.5)	18-Jan-16	16:30	SEDIMENT	X	X	X	X	X	X	X						3
	PCL09 (1.5-2.05)	18-Jan-16	16:37	SEDIMENT				X	X					x			2

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Detailed breakdown of particle size for clay and silt fractions. Dioxins and Furans to be reported with WHO 1998 fish TEQs. Some samples for analysis AND archival. Archived samples to be held for 6 months.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Molly Brewis	19-Jan-16	7:00	Jean	20 Jan	13:50	2,3,4 °C				

GENF 18.01 Front

STANTEC CONSULTING LTD.
ATTN: Molly Brewis
400 - 2261 Keating Cross Road
Saanichton BC V8M 2A5

Date Received: 22-JAN-16
Report Date: 18-MAR-16 16:31 (MT)
Version: FINAL REV. 4

Client Phone: 250-655-6979

Certificate of Analysis

Lab Work Order #: L1726341

Project P.O. #: NOT SUBMITTED
Job Reference: 123220054 TASK 525.100
C of C Numbers:
Legal Site Desc:

Comments: 7-MAR-2016 This report replaces the previous version and includes additional analyses, as requested.
18-MAR-2016 Mercury data updated for sample # 38

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1726341-1 Sediment 19-JAN-16 11:50 PCS10 (0-0.2)	L1726341-2 Sediment 19-JAN-16 11:57 PCS10 (0.2-0.4)	L1726341-3 Sediment 19-JAN-16 12:03 PCS10 (0.4-0.6)	L1726341-4 Sediment 19-JAN-16 12:05 PCS10 (0.6-0.8)	L1726341-5 Sediment 19-JAN-16 12:10 PCS10 (0.8-1.0)
Sample ID / Description / Sampled Date / Sampled Time / Client ID						
SOIL						
Physical Tests	% Moisture (%)	29.8	24.2	24.3	23.1	22.8
	Moisture (%)					
Particle Size	% Gravel (>2mm) (%)	0.11	0.12	1.29	0.75	0.74
	% Sand (2.00mm - 1.00mm) (%)	0.78	1.02	3.93	3.84	2.60
	% Sand (1.00mm - 0.50mm) (%)	1.09	1.38	3.42	3.38	3.47
	% Sand (0.50mm - 0.25mm) (%)	4.24	4.14	5.98	6.97	7.22
	% Sand (0.25mm - 0.125mm) (%)	33.5	37.2	36.5	41.4	45.8
	% Sand (0.125mm - 0.063mm) (%)	13.3	13.7	13.3	15.9	16.5
	% Silt (0.063mm - 0.0312mm) (%)	10.9	10.1	8.61	7.72	6.48
	% Silt (0.0312mm - 0.004mm) (%)	20.9	18.1	14.8	10.7	8.71
	% Clay (<4um) (%)	15.2	14.2	12.1	9.28	8.51
	Texture	Sandy loam	Sandy loam	Sandy loam	Sandy loam	Loamy sand
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.12	0.97	0.96	0.85	0.65
Saturated Paste Extractables	Chloride (Cl) (mg/kg)					
	% Saturation (%)					
	Sodium (Na) (mg/kg)					
Metals	Arsenic (As) (mg/kg)					
	Cadmium (Cd) (mg/kg)					
	Chromium (Cr) (mg/kg)					
	Copper (Cu) (mg/kg)					
	Lead (Pb) (mg/kg)					
	Mercury (Hg) (mg/kg)					
	Nickel (Ni) (mg/kg)					
	Zinc (Zn) (mg/kg)					
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)					
	Acenaphthylene (mg/kg)					
	Anthracene (mg/kg)					
	Benz(a)anthracene (mg/kg)					
	Benzo(a)pyrene (mg/kg)					
	Benzo(b)fluoranthene (mg/kg)					
	Benzo(g,h,i)perylene (mg/kg)					
	Benzo(k)fluoranthene (mg/kg)					
	Chrysene (mg/kg)					
	Dibenz(a,h)anthracene (mg/kg)					
	Fluoranthene (mg/kg)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1726341-8	L1726341-9	L1726341-10	L1726341-11	L1726341-12
Description	Sediment	Sediment	Sediment	Sediment	Sediment
Sampled Date	19-JAN-16	19-JAN-16	19-JAN-16	19-JAN-16	19-JAN-16
Sampled Time	12:32	12:41	12:47	12:56	
Client ID	PCL10 (0-0.5)	PCL10 (0.5-1.0)	PCL10 (1.0-1.5)	PCL10 (1.5-1.86)	SPLIT 3 (0-0.5)
Grouping / **Analyte**					
SOIL					
Physical Tests					
% Moisture (%)				17.6	
Moisture (%)	27.5	25.0	20.5		27.7
Particle Size					
% Gravel (>2mm) (%)	0.91	1.45	5.49	3.81	1.79
% Sand (2.00mm - 1.00mm) (%)	3.06	3.46	4.68	3.74	3.51
% Sand (1.00mm - 0.50mm) (%)	2.20	3.96	5.11	4.90	2.66
% Sand (0.50mm - 0.25mm) (%)	4.95	8.51	9.64	9.46	6.04
% Sand (0.25mm - 0.125mm) (%)	33.6	39.2	36.3	15.1	32.5
% Sand (0.125mm - 0.063mm) (%)	15.4	15.5	17.8	12.2	13.9
% Silt (0.063mm - 0.0312mm) (%)	9.30	7.51	6.71	11.2	9.68
% Silt (0.0312mm - 0.004mm) (%)	16.8	10.5	6.94	20.0	16.4
% Clay (<4um) (%)	13.8	9.85	7.30	19.6	13.5
Texture	Sandy loam	Sandy loam	Loamy sand	Loam	Sandy loam
Organic / Inorganic Carbon					
Total Organic Carbon (%)	0.89	0.90	0.65		0.92
Saturated Paste Extractables					
Chloride (Cl) (mg/kg)	5290	3490	3550		
% Saturation (%)	37.5	33.4	30.0		
Sodium (Na) (mg/kg)	3020	1820	1800		
Metals					
Arsenic (As) (mg/kg)	7.60	6.22	4.48		7.54
Cadmium (Cd) (mg/kg)	0.137	0.158	0.175		0.155
Chromium (Cr) (mg/kg)	18.9	14.8	14.7		18.2
Copper (Cu) (mg/kg)	17.9	11.4	10.7		17.8
Lead (Pb) (mg/kg)	5.18	3.35	2.69		5.13
Mercury (Hg) (mg/kg)	0.0295	0.0160	0.0121		0.0296
Nickel (Ni) (mg/kg)	14.5	10.7	10.3		14.9
Zinc (Zn) (mg/kg)	55.6	40.2	35.9		54.9
Polycyclic Aromatic Hydrocarbons					
Acenaphthene (mg/kg)	<0.050	<0.050	<0.050		<0.050
Acenaphthylene (mg/kg)	<0.050	<0.050	<0.050		<0.050
Anthracene (mg/kg)	<0.050	<0.050	<0.050		<0.050
Benz(a)anthracene (mg/kg)	<0.050	<0.050	<0.050		<0.050
Benzo(a)pyrene (mg/kg)	<0.050	<0.050	<0.050		<0.050
Benzo(b)fluoranthene (mg/kg)	<0.050	<0.050	<0.050		<0.050
Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050	<0.050		<0.050
Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050	<0.050		<0.050
Chrysene (mg/kg)	<0.050	<0.050	<0.050		<0.050
Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050	<0.050		<0.050
Fluoranthene (mg/kg)	<0.050	<0.050	<0.050		<0.050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1726341-13	L1726341-14	L1726341-15	L1726341-16	L1726341-17
Description	Sediment	Sediment	Sediment	Sediment	Sediment
Sampled Date	19-JAN-16	19-JAN-16	19-JAN-16	19-JAN-16	19-JAN-16
Sampled Time				14:26	15:41
Client ID	SPLIT 3 (0.5-1.0)	SPLIT 3 (1.0-1.5)	SPLIT 3 (1.5-1.86)	PCS21 (0-0.2)	PCS33 (0-0.2)
Grouping / **Analyte**					
SOIL					
Physical Tests % Moisture (%)			15.4		33.6
Moisture (%)	25.1	21.0		24.0	
Particle Size % Gravel (>2mm) (%)	1.56	3.21	9.66	8.44	7.79
% Sand (2.00mm - 1.00mm) (%)	4.79	4.75	5.96	14.6	12.2
% Sand (1.00mm - 0.50mm) (%)	4.75	5.03	6.21	21.1	15.7
% Sand (0.50mm - 0.25mm) (%)	9.13	10.2	10.6	23.8	19.9
% Sand (0.25mm - 0.125mm) (%)	37.5	36.5	15.4	8.80	19.0
% Sand (0.125mm - 0.063mm) (%)	15.7	17.2	11.6	3.18	5.95
% Silt (0.063mm - 0.0312mm) (%)	7.60	7.07	9.80	4.11	4.34
% Silt (0.0312mm - 0.004mm) (%)	9.70	7.65	16.2	9.28	7.95
% Clay (<4um) (%)	9.29	8.41	14.7	6.58	7.16
Texture	Sandy loam	Loamy sand	Sandy loam	Loamy sand	Loamy sand
Organic / Inorganic Carbon Total Organic Carbon (%)	0.77	0.66		0.29	0.71
Saturated Paste Extractables Chloride (Cl) (mg/kg)					
% Saturation (%)					
Sodium (Na) (mg/kg)					
Metals Arsenic (As) (mg/kg)	6.59	4.50		5.26	
Cadmium (Cd) (mg/kg)	0.175	0.156		0.136	
Chromium (Cr) (mg/kg)	15.3	17.5		17.2	
Copper (Cu) (mg/kg)	11.5	12.3		15.7	
Lead (Pb) (mg/kg)	3.33	2.80		5.77	
Mercury (Hg) (mg/kg)	0.0167	0.0123		0.0241	
Nickel (Ni) (mg/kg)	10.8	11.9		11.1	
Zinc (Zn) (mg/kg)	42.1	39.1		47.9	
Polycyclic Aromatic Hydrocarbons Acenaphthene (mg/kg)	<0.050	<0.050		<0.050	
Acenaphthylene (mg/kg)	<0.050	<0.050		<0.050	
Anthracene (mg/kg)	<0.050	<0.050		<0.050	
Benz(a)anthracene (mg/kg)	<0.050	<0.050		<0.050	
Benzo(a)pyrene (mg/kg)	<0.050	<0.050		<0.050	
Benzo(b)fluoranthene (mg/kg)	<0.050	<0.050		<0.050	
Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050		<0.050	
Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050		<0.050	
Chrysene (mg/kg)	<0.050	<0.050		<0.050	
Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050		<0.050	
Fluoranthene (mg/kg)	<0.050	<0.050		<0.050	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1726341-18 Sediment 19-JAN-16 15:46 PCL33 (0-0.5)	L1726341-19 Sediment 20-JAN-16 10:17 PCS19 (0-0.2)	L1726341-20 Sediment 20-JAN-16 10:23 PCS19 (0.2-0.4)	L1726341-21 Sediment 20-JAN-16 10:29 PCS19 (0.4-0.65)	L1726341-22 Sediment 20-JAN-16 SPLIT 4 (0-0.2)
Sample ID / Description / Sampled Date / Sampled Time / Client ID						
SOIL						
Physical Tests	% Moisture (%)		36.0	28.2	14.4	35.5
	Moisture (%)	26.9				
Particle Size	% Gravel (>2mm) (%)	11.4	0.63	3.69	13.0	1.71
	% Sand (2.00mm - 1.00mm) (%)	11.3	4.56	10.9	12.9	4.67
	% Sand (1.00mm - 0.50mm) (%)	15.5	6.90	11.4	16.2	6.49
	% Sand (0.50mm - 0.25mm) (%)	16.9	6.92	14.8	23.4	5.79
	% Sand (0.25mm - 0.125mm) (%)	15.9	5.90	11.0	15.6	6.92
	% Sand (0.125mm - 0.063mm) (%)	6.18	6.74	7.77	7.20	7.57
	% Silt (0.063mm - 0.0312mm) (%)	4.87	11.1	8.07	3.85	11.7
	% Silt (0.0312mm - 0.004mm) (%)	9.38	29.4	17.1	4.45	29.5
	% Clay (<4um) (%)	8.65	27.8	15.3	3.43	25.7
	Texture	Sandy loam	Loam	Sandy loam	Sand	Loam
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.37	1.70	0.91	0.42	1.03
Saturated Paste Extractables	Chloride (Cl) (mg/kg)	4090				
	% Saturation (%)	34.8				
	Sodium (Na) (mg/kg)	2260				
Metals	Arsenic (As) (mg/kg)	4.60				
	Cadmium (Cd) (mg/kg)	0.115				
	Chromium (Cr) (mg/kg)	16.7				
	Copper (Cu) (mg/kg)	12.4				
	Lead (Pb) (mg/kg)	3.97				
	Mercury (Hg) (mg/kg)	0.0196				
	Nickel (Ni) (mg/kg)	10.1				
	Zinc (Zn) (mg/kg)	40.1				
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050				
	Acenaphthylene (mg/kg)	<0.050				
	Anthracene (mg/kg)	<0.050				
	Benz(a)anthracene (mg/kg)	<0.050				
	Benzo(a)pyrene (mg/kg)	<0.050				
	Benzo(b)fluoranthene (mg/kg)	<0.050				
	Benzo(g,h,i)perylene (mg/kg)	<0.050				
	Benzo(k)fluoranthene (mg/kg)	<0.050				
	Chrysene (mg/kg)	<0.050				
	Dibenz(a,h)anthracene (mg/kg)	<0.050				
	Fluoranthene (mg/kg)	<0.050				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1726341-23	L1726341-24	L1726341-25	L1726341-26	L1726341-27
Description	Sediment	Sediment	Sediment	Sediment	Sediment
Sampled Date	20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16
Sampled Time			12:31	12:51	13:15
Client ID	SPLIT 4 (0.2-0.4)	SPLIT 4 (0.4-0.65)	SS03 (0-0.075)	SS02 (0-0.075)	SS01 (0-0.075)
Grouping / **Analyte**					
SOIL					
Physical Tests					
% Moisture (%)	28.1	12.3			
Moisture (%)			44.9	37.3	39.4
Particle Size					
% Gravel (>2mm) (%)	3.43	13.9	0.16	2.10	0.31
% Sand (2.00mm - 1.00mm) (%)	10.9	9.93	0.33	2.67	1.53
% Sand (1.00mm - 0.50mm) (%)	12.8	16.9	0.21	1.97	1.46
% Sand (0.50mm - 0.25mm) (%)	14.0	23.4	0.38	3.64	3.56
% Sand (0.25mm - 0.125mm) (%)	11.3	16.0	5.35	25.1	17.4
% Sand (0.125mm - 0.063mm) (%)	8.03	7.77	8.74	9.63	9.04
% Silt (0.063mm - 0.0312mm) (%)	7.88	4.03	15.6	10.3	11.2
% Silt (0.0312mm - 0.004mm) (%)	16.9	4.51	40.3	24.4	29.7
% Clay (<4um) (%)	14.8	3.62	29.0	20.2	25.8
Texture	Sandy loam	Sand	Silt loam	Loam	Loam
Organic / Inorganic Carbon					
Total Organic Carbon (%)	0.84	0.58	1.88	1.56	1.47
Saturated Paste Extractables					
Chloride (Cl) (mg/kg)			11100	6490	7550
% Saturation (%)			66.2	50.2	53.6
Sodium (Na) (mg/kg)			6030	3750	4370
Metals					
Arsenic (As) (mg/kg)			9.80	6.50	8.93
Cadmium (Cd) (mg/kg)			0.180	0.134	0.142
Chromium (Cr) (mg/kg)			29.8	21.6	23.8
Copper (Cu) (mg/kg)			41.2	24.8	28.2
Lead (Pb) (mg/kg)			10.9	7.45	8.24
Mercury (Hg) (mg/kg)			0.0697	0.0426	0.0462
Nickel (Ni) (mg/kg)			25.8	18.2	20.5
Zinc (Zn) (mg/kg)			93.0	66.2	72.7
Polycyclic Aromatic Hydrocarbons					
Acenaphthene (mg/kg)			<0.050	<0.050	<0.050
Acenaphthylene (mg/kg)			<0.050	<0.050	<0.050
Anthracene (mg/kg)			<0.050	<0.050	<0.050
Benz(a)anthracene (mg/kg)			<0.050	<0.050	<0.050
Benzo(a)pyrene (mg/kg)			<0.050	<0.050	<0.050
Benzo(b)fluoranthene (mg/kg)			<0.050	<0.050	<0.050
Benzo(g,h,i)perylene (mg/kg)			<0.050	<0.050	<0.050
Benzo(k)fluoranthene (mg/kg)			<0.050	<0.050	<0.050
Chrysene (mg/kg)			<0.050	<0.050	<0.050
Dibenz(a,h)anthracene (mg/kg)			<0.050	<0.050	<0.050
Fluoranthene (mg/kg)			<0.050	<0.050	<0.050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1726341-28 Sediment 20-JAN-16 15:42 PCS25 (0-0.2)	L1726341-29 Sediment 20-JAN-16 15:45 PCS25 (0.2-0.4)	L1726341-30 Sediment 20-JAN-16 15:49 PCS25 (0.4-0.6)	L1726341-31 Sediment 20-JAN-16 15:53 PCS25 (0.6-0.8)	L1726341-32 Sediment 20-JAN-16 15:59 PCS25 (0.8-1.0)
Sample ID		L1726341-28	L1726341-29	L1726341-30	L1726341-31	L1726341-32
Description		Sediment	Sediment	Sediment	Sediment	Sediment
Sampled Date		20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16
Sampled Time		15:42	15:45	15:49	15:53	15:59
Client ID		PCS25 (0-0.2)	PCS25 (0.2-0.4)	PCS25 (0.4-0.6)	PCS25 (0.6-0.8)	PCS25 (0.8-1.0)
SOIL						
Physical Tests	% Moisture (%)	37.2	35.8	31.9	34.7	31.3
	Moisture (%)					
Particle Size	% Gravel (>2mm) (%)	1.05	<0.10	0.41	0.79	0.28
	% Sand (2.00mm - 1.00mm) (%)	4.09	0.29	1.31	2.26	1.46
	% Sand (1.00mm - 0.50mm) (%)	4.50	0.58	0.79	1.40	1.43
	% Sand (0.50mm - 0.25mm) (%)	4.35	1.20	2.01	2.47	2.23
	% Sand (0.25mm - 0.125mm) (%)	10.6	7.01	10.8	12.3	13.4
	% Sand (0.125mm - 0.063mm) (%)	12.6	13.1	20.3	17.3	23.9
	% Silt (0.063mm - 0.0312mm) (%)	12.4	13.9	15.1	13.3	14.8
	% Silt (0.0312mm - 0.004mm) (%)	27.8	34.2	26.5	26.3	23.2
	% Clay (<4um) (%)	22.6	29.7	22.8	23.8	19.4
	Texture	Loam	Silt loam	Loam	Loam	Loam
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.63	1.73	1.19	1.41	1.29
Saturated Paste Extractables	Chloride (Cl) (mg/kg)					
	% Saturation (%)					
	Sodium (Na) (mg/kg)					
Metals	Arsenic (As) (mg/kg)					
	Cadmium (Cd) (mg/kg)					
	Chromium (Cr) (mg/kg)					
	Copper (Cu) (mg/kg)					
	Lead (Pb) (mg/kg)					
	Mercury (Hg) (mg/kg)					
	Nickel (Ni) (mg/kg)					
	Zinc (Zn) (mg/kg)					
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)					
	Acenaphthylene (mg/kg)					
	Anthracene (mg/kg)					
	Benz(a)anthracene (mg/kg)					
	Benzo(a)pyrene (mg/kg)					
	Benzo(b)fluoranthene (mg/kg)					
	Benzo(g,h,i)perylene (mg/kg)					
	Benzo(k)fluoranthene (mg/kg)					
	Chrysene (mg/kg)					
	Dibenz(a,h)anthracene (mg/kg)					
	Fluoranthene (mg/kg)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1726341-35	L1726341-36	L1726341-37	L1726341-38	L1726341-39
Description	Sediment	Sediment	Sediment	Sediment	Sediment
Sampled Date	20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16
Sampled Time	16:17	16:30	16:33	16:40	16:47
Client ID	PCL25 (0-0.5)	PCL25 (0.5-1.0)	PCL25 (1.0-1.5)	PCL25 (1.5-2.0)	PCL25 (2.0-2.5)
Grouping **Analyte**					
SOIL					
Physical Tests % Moisture (%)				25.9	25.9
Moisture (%)	35.8	32.6	32.1		
Particle Size % Gravel (>2mm) (%)	0.34	0.32	<0.10	0.43	0.46
% Sand (2.00mm - 1.00mm) (%)	0.82	0.80	0.47	1.33	1.45
% Sand (1.00mm - 0.50mm) (%)	1.01	0.99	0.98	1.99	1.70
% Sand (0.50mm - 0.25mm) (%)	2.00	2.19	1.83	3.81	2.46
% Sand (0.25mm - 0.125mm) (%)	10.4	10.4	15.4	28.9	33.7
% Sand (0.125mm - 0.063mm) (%)	17.7	19.9	24.3	22.7	27.0
% Silt (0.063mm - 0.0312mm) (%)	15.0	15.8	14.4	11.2	9.99
% Silt (0.0312mm - 0.004mm) (%)	29.6	27.3	22.8	15.4	11.4
% Clay (<4um) (%)	23.1	22.3	19.7	14.2	11.9
Texture	Loam	Loam	Loam	Sandy loam	Sandy loam
Organic / Inorganic Carbon Total Organic Carbon (%)	1.68	1.40	1.16		
Saturated Paste Extractables Chloride (Cl) (mg/kg)	7190	6670	5870		
% Saturation (%)	56.4	58.1	53.7		
Sodium (Na) (mg/kg)	4200	4080	3180		
Metals Arsenic (As) (mg/kg)	9.73	9.54	8.88	8.19	7.01
Cadmium (Cd) (mg/kg)	0.167	0.160	0.138	0.192	0.248
Chromium (Cr) (mg/kg)	22.9	22.8	22.3	18.6	14.9
Copper (Cu) (mg/kg)	29.5	21.6	19.4	14.7	10.6
Lead (Pb) (mg/kg)	8.95	5.65	5.11	3.95	2.83
Mercury (Hg) (mg/kg)	0.0572	0.0308	0.0279	0.0239	0.228
Nickel (Ni) (mg/kg)	19.0	18.4	17.7	14.3	10.1
Zinc (Zn) (mg/kg)	70.9	63.7	59.7	50.3	35.9
Polycyclic Aromatic Hydrocarbons Acenaphthene (mg/kg)	<0.050	<0.050	<0.050		
Acenaphthylene (mg/kg)	<0.050	<0.050	<0.050		
Anthracene (mg/kg)	<0.050	<0.050	<0.050		
Benz(a)anthracene (mg/kg)	<0.050	<0.050	<0.050		
Benzo(a)pyrene (mg/kg)	<0.050	<0.050	<0.050		
Benzo(b)fluoranthene (mg/kg)	<0.050	<0.050	<0.050		
Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050	<0.050		
Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050	<0.050		
Chrysene (mg/kg)	<0.050	<0.050	<0.050		
Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050	<0.050		
Fluoranthene (mg/kg)	0.073	<0.050	<0.050		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1726341-40				
	Description	Sediment				
	Sampled Date	20-JAN-16				
	Sampled Time					
	Client ID	SPLIT 5 (0-0.075)				
Grouping	**Analyte**					
SOIL						
Physical Tests	% Moisture (%)					
	Moisture (%)	39.6				
Particle Size	% Gravel (>2mm) (%)	0.81				
	% Sand (2.00mm - 1.00mm) (%)	1.67				
	% Sand (1.00mm - 0.50mm) (%)	1.41				
	% Sand (0.50mm - 0.25mm) (%)	3.77				
	% Sand (0.25mm - 0.125mm) (%)	16.7				
	% Sand (0.125mm - 0.063mm) (%)	9.07				
	% Silt (0.063mm - 0.0312mm) (%)	11.7				
	% Silt (0.0312mm - 0.004mm) (%)	29.7				
	% Clay (<4um) (%)	25.3				
	Texture	Loam				
Organic / Inorganic Carbon	Total Organic Carbon (%)	1.43				
Saturated Paste Extractables	Chloride (Cl) (mg/kg)					
	% Saturation (%)					
	Sodium (Na) (mg/kg)					
Metals	Arsenic (As) (mg/kg)	8.48				
	Cadmium (Cd) (mg/kg)	0.143				
	Chromium (Cr) (mg/kg)	24.3				
	Copper (Cu) (mg/kg)	30.3				
	Lead (Pb) (mg/kg)	8.57				
	Mercury (Hg) (mg/kg)	0.0500				
	Nickel (Ni) (mg/kg)	22.0				
	Zinc (Zn) (mg/kg)	77.4				
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050				
	Acenaphthylene (mg/kg)	<0.050				
	Anthracene (mg/kg)	<0.050				
	Benz(a)anthracene (mg/kg)	<0.050				
	Benzo(a)pyrene (mg/kg)	<0.050				
	Benzo(b)fluoranthene (mg/kg)	<0.050				
	Benzo(g,h,i)perylene (mg/kg)	<0.050				
	Benzo(k)fluoranthene (mg/kg)	<0.050				
	Chrysene (mg/kg)	<0.050				
	Dibenz(a,h)anthracene (mg/kg)	<0.050				
	Fluoranthene (mg/kg)	<0.050				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1726341-1	L1726341-2	L1726341-3	L1726341-4	L1726341-5
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	19-JAN-16	19-JAN-16	19-JAN-16	19-JAN-16	19-JAN-16
	Sampled Time	11:50	11:57	12:03	12:05	12:10
	Client ID	PCS10 (0-0.2)	PCS10 (0.2-0.4)	PCS10 (0.4-0.6)	PCS10 (0.6-0.8)	PCS10 (0.8-1.0)
Grouping	**Analyte**					
SOIL						
Polycyclic Aromatic Hydrocarbons	Fluorene (mg/kg)					
	Indeno(1,2,3-c,d)pyrene (mg/kg)					
	Naphthalene (mg/kg)					
	Phenanthrene (mg/kg)					
	Pyrene (mg/kg)					
	Surrogate: Acenaphthene d10 (%)					
	Surrogate: Chrysene d12 (%)					
	Surrogate: Naphthalene d8 (%)					
	Surrogate: Phenanthrene d10 (%)					
	Total PAHs (mg/kg)					
Polychlorinated Biphenyls	Aroclor 1016 (mg/kg)					
	PCB-1016 (mg/kg)					
	Aroclor 1221 (mg/kg)					
	PCB-1221 (mg/kg)					
	Aroclor 1232 (mg/kg)					
	PCB-1232 (mg/kg)					
	Aroclor 1242 (mg/kg)					
	PCB-1242 (mg/kg)					
	Aroclor 1248 (mg/kg)					
	PCB-1248 (mg/kg)					
	Aroclor 1254 (mg/kg)					
	PCB-1254 (mg/kg)					
	Aroclor 1260 (mg/kg)					
	PCB-1260 (mg/kg)					
	Aroclor 1262 (mg/kg)					
	PCB-1262 (mg/kg)					
	Aroclor 1268 (mg/kg)					
	PCB-1268 (mg/kg)					
	Surrogate: Decachlorobiphenyl (%)					
	Total PCBs (mg/kg)					
	Total PCB (BC CSR) (mg/kg)					
	Total Polychlorinated Biphenyls (mg/kg)					
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)	0.483242	0.455421	0.408799	0.412079	0.3850793
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)	0.449942	0.240071	0.20441	0.2105085	0.19253965

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1726341-8 Sediment 19-JAN-16 12:32 PCL10 (0-0.5)	L1726341-9 Sediment 19-JAN-16 12:41 PCL10 (0.5-1.0)	L1726341-10 Sediment 19-JAN-16 12:47 PCL10 (1.0-1.5)	L1726341-11 Sediment 19-JAN-16 12:56 PCL10 (1.5-1.86)	L1726341-12 Sediment 19-JAN-16 SPLIT 3 (0-0.5)
SOIL						
Polycyclic Aromatic Hydrocarbons	Fluorene (mg/kg)	<0.050	<0.050	<0.050		<0.050
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050	<0.050		<0.050
	Naphthalene (mg/kg)	<0.050	<0.050	<0.050		<0.050
	Phenanthrene (mg/kg)	<0.050	<0.050	<0.050		<0.050
	Pyrene (mg/kg)	<0.050	<0.050	<0.050		<0.050
	Surrogate: Acenaphthene d10 (%)	84.2	88.4	78.4		89.2
	Surrogate: Chrysene d12 (%)	Not Reportable SMI	100.9	96.3		99.7
	Surrogate: Naphthalene d8 (%)	79.5	85.1	76.1		87.4
	Surrogate: Phenanthrene d10 (%)	114.5	99.9	103.0		99.0
	Total PAHs (mg/kg)	<0.20	<0.20	<0.20		<0.20
Polychlorinated Biphenyls	Aroclor 1016 (mg/kg)	<0.010	<0.010	<0.010		<0.010
	PCB-1016 (mg/kg)					
	Aroclor 1221 (mg/kg)	<0.010	<0.010	<0.010		<0.010
	PCB-1221 (mg/kg)					
	Aroclor 1232 (mg/kg)	<0.010	<0.010	<0.010		<0.010
	PCB-1232 (mg/kg)					
	Aroclor 1242 (mg/kg)	<0.010	<0.010	<0.010		<0.010
	PCB-1242 (mg/kg)					
	Aroclor 1248 (mg/kg)	<0.010	<0.010	<0.010		<0.010
	PCB-1248 (mg/kg)					
	Aroclor 1254 (mg/kg)	<0.010	<0.010	<0.010		<0.010
	PCB-1254 (mg/kg)					
	Aroclor 1260 (mg/kg)	<0.010	<0.010	<0.010		<0.010
	PCB-1260 (mg/kg)					
	Aroclor 1262 (mg/kg)	<0.010	<0.010	<0.010		<0.010
	PCB-1262 (mg/kg)					
	Aroclor 1268 (mg/kg)	<0.010	<0.010	<0.010		<0.010
	PCB-1268 (mg/kg)					
	Surrogate: Decachlorobiphenyl (%)	N/A SMI	109.4	116.0		110.4
	Total PCBs (mg/kg)	<0.020	<0.020	<0.020		<0.020
	Total PCB (BC CSR) (mg/kg)					
	Total Polychlorinated Biphenyls (mg/kg)					
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)					
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1726341-13	L1726341-14	L1726341-15	L1726341-16	L1726341-17
Description	Sediment	Sediment	Sediment	Sediment	Sediment
Sampled Date	19-JAN-16	19-JAN-16	19-JAN-16	19-JAN-16	19-JAN-16
Sampled Time				14:26	15:41
Client ID	SPLIT 3 (0.5-1.0)	SPLIT 3 (1.0-1.5)	SPLIT 3 (1.5-1.86)	PCS21 (0-0.2)	PCS33 (0-0.2)
Grouping / **Analyte**					
SOIL					
Polycyclic Aromatic Hydrocarbons					
Fluorene (mg/kg)	<0.050	<0.050		<0.050	
Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050		<0.050	
Naphthalene (mg/kg)	<0.050	<0.050		<0.050	
Phenanthrene (mg/kg)	<0.050	<0.050		<0.050	
Pyrene (mg/kg)	<0.050	<0.050		<0.050	
Surrogate: Acenaphthene d10 (%)	84.6	89.6		106.7	
Surrogate: Chrysene d12 (%)	99.1	109.1		102.9	
Surrogate: Naphthalene d8 (%)	83.3	88.2		104.3	
Surrogate: Phenanthrene d10 (%)	92.9	107.6		109.0	
Total PAHs (mg/kg)	<0.20	<0.20		<0.20	
Polychlorinated Biphenyls					
Aroclor 1016 (mg/kg)		<0.010		<0.010	
PCB-1016 (mg/kg)	<0.020				
Aroclor 1221 (mg/kg)		<0.010		<0.010	
PCB-1221 (mg/kg)	<0.020				
Aroclor 1232 (mg/kg)		<0.010		<0.010	
PCB-1232 (mg/kg)	<0.020				
Aroclor 1242 (mg/kg)		<0.010		<0.010	
PCB-1242 (mg/kg)	<0.020				
Aroclor 1248 (mg/kg)		<0.010		<0.010	
PCB-1248 (mg/kg)	<0.020				
Aroclor 1254 (mg/kg)		<0.010		<0.010	
PCB-1254 (mg/kg)	<0.020				
Aroclor 1260 (mg/kg)		<0.010		<0.010	
PCB-1260 (mg/kg)	<0.020				
Aroclor 1262 (mg/kg)		<0.010		<0.010	
PCB-1262 (mg/kg)	<0.020				
Aroclor 1268 (mg/kg)		<0.010		<0.010	
PCB-1268 (mg/kg)	<0.020				
Surrogate: Decachlorobiphenyl (%)		95.0		101.4	
Total PCBs (mg/kg)		<0.020		<0.020	
Total PCB (BC CSR) (mg/kg)	<0.020				
Total Polychlorinated Biphenyls (mg/kg)	<0.020				
Dioxins and Furans					
WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)				0.787439	0.679941
WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)				0.415489	0.3479815

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1726341-18	L1726341-19	L1726341-20	L1726341-21	L1726341-22
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	19-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16
	Sampled Time	15:46	10:17	10:23	10:29	
	Client ID	PCL33 (0-0.5)	PCS19 (0-0.2)	PCS19 (0.2-0.4)	PCS19 (0.4-0.65)	SPLIT 4 (0-0.2)
Grouping	**Analyte**					
SOIL						
Polycyclic Aromatic Hydrocarbons	Fluorene (mg/kg)	<0.050				
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050				
	Naphthalene (mg/kg)	<0.050				
	Phenanthrene (mg/kg)	<0.050				
	Pyrene (mg/kg)	<0.050				
	Surrogate: Acenaphthene d10 (%)	86.7				
	Surrogate: Chrysene d12 (%)	100.1				
	Surrogate: Naphthalene d8 (%)	84.5				
	Surrogate: Phenanthrene d10 (%)	106.8				
	Total PAHs (mg/kg)	<0.20				
Polychlorinated Biphenyls	Aroclor 1016 (mg/kg)	<0.010				
	PCB-1016 (mg/kg)					
	Aroclor 1221 (mg/kg)	<0.010				
	PCB-1221 (mg/kg)					
	Aroclor 1232 (mg/kg)	<0.010				
	PCB-1232 (mg/kg)					
	Aroclor 1242 (mg/kg)	<0.010				
	PCB-1242 (mg/kg)					
	Aroclor 1248 (mg/kg)	<0.010				
	PCB-1248 (mg/kg)					
	Aroclor 1254 (mg/kg)	<0.010				
	PCB-1254 (mg/kg)					
	Aroclor 1260 (mg/kg)	<0.010				
	PCB-1260 (mg/kg)					
	Aroclor 1262 (mg/kg)	<0.010				
	PCB-1262 (mg/kg)					
	Aroclor 1268 (mg/kg)	<0.010				
	PCB-1268 (mg/kg)					
	Surrogate: Decachlorobiphenyl (%)	93.9				
	Total PCBs (mg/kg)	<0.020				
	Total PCB (BC CSR) (mg/kg)					
	Total Polychlorinated Biphenyls (mg/kg)					
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)		0.7592033	0.2815984	0.1660305	0.271767
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)		0.3798033	0.1408087	0.08301855	0.141032

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1726341-23	L1726341-24	L1726341-25	L1726341-26	L1726341-27
Description	Sediment	Sediment	Sediment	Sediment	Sediment
Sampled Date	20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16
Sampled Time			12:31	12:51	13:15
Client ID	SPLIT 4 (0.2-0.4)	SPLIT 4 (0.4-0.65)	SS03 (0-0.075)	SS02 (0-0.075)	SS01 (0-0.075)
Grouping **Analyte**					
SOIL					
Polycyclic Aromatic Hydrocarbons Fluorene (mg/kg)			<0.050	<0.050	<0.050
Indeno(1,2,3-c,d)pyrene (mg/kg)			<0.050	<0.050	<0.050
Naphthalene (mg/kg)			<0.050	<0.050	<0.050
Phenanthrene (mg/kg)			<0.050	<0.050	<0.050
Pyrene (mg/kg)			<0.050	<0.050	<0.050
Surrogate: Acenaphthene d10 (%)			95.6	92.4	92.9
Surrogate: Chrysene d12 (%)			107.9	102.1	99.6
Surrogate: Naphthalene d8 (%)			92.2	87.6	86.5
Surrogate: Phenanthrene d10 (%)			108.3	103.2	104.1
Total PAHs (mg/kg)			<0.20	<0.20	<0.20
Polychlorinated Biphenyls Aroclor 1016 (mg/kg)			<0.010	<0.010	<0.010
PCB-1016 (mg/kg)					
Aroclor 1221 (mg/kg)			<0.010	<0.010	<0.010
PCB-1221 (mg/kg)					
Aroclor 1232 (mg/kg)			<0.010	<0.010	<0.010
PCB-1232 (mg/kg)					
Aroclor 1242 (mg/kg)			<0.010	<0.010	<0.010
PCB-1242 (mg/kg)					
Aroclor 1248 (mg/kg)			<0.010	<0.010	<0.010
PCB-1248 (mg/kg)					
Aroclor 1254 (mg/kg)			<0.010	<0.010	<0.010
PCB-1254 (mg/kg)					
Aroclor 1260 (mg/kg)			<0.010	<0.010	<0.010
PCB-1260 (mg/kg)					
Aroclor 1262 (mg/kg)			<0.010	<0.010	<0.010
PCB-1262 (mg/kg)					
Aroclor 1268 (mg/kg)			<0.010	<0.010	<0.010
PCB-1268 (mg/kg)					
Surrogate: Decachlorobiphenyl (%)			127.9	N/A SMI	N/A SMI
Total PCBs (mg/kg)			<0.020	<0.020	<0.020
Total PCB (BC CSR) (mg/kg)					
Total Polychlorinated Biphenyls (mg/kg)					
Dioxins and Furans WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)	0.2487333	0.2071852			
WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)	0.1243783	0.1035926			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1726341-28 Sediment 20-JAN-16 15:42 PCS25 (0-0.2)	L1726341-29 Sediment 20-JAN-16 15:45 PCS25 (0.2-0.4)	L1726341-30 Sediment 20-JAN-16 15:49 PCS25 (0.4-0.6)	L1726341-31 Sediment 20-JAN-16 15:53 PCS25 (0.6-0.8)	L1726341-32 Sediment 20-JAN-16 15:59 PCS25 (0.8-1.0)
Sample ID						
Description						
Sampled Date						
Sampled Time						
Client ID						
SOIL						
Polycyclic Aromatic Hydrocarbons	Fluorene (mg/kg)					
	Indeno(1,2,3-c,d)pyrene (mg/kg)					
	Naphthalene (mg/kg)					
	Phenanthrene (mg/kg)					
	Pyrene (mg/kg)					
	Surrogate: Acenaphthene d10 (%)					
	Surrogate: Chrysene d12 (%)					
	Surrogate: Naphthalene d8 (%)					
	Surrogate: Phenanthrene d10 (%)					
	Total PAHs (mg/kg)					
Polychlorinated Biphenyls	Aroclor 1016 (mg/kg)					
	PCB-1016 (mg/kg)					
	Aroclor 1221 (mg/kg)					
	PCB-1221 (mg/kg)					
	Aroclor 1232 (mg/kg)					
	PCB-1232 (mg/kg)					
	Aroclor 1242 (mg/kg)					
	PCB-1242 (mg/kg)					
	Aroclor 1248 (mg/kg)					
	PCB-1248 (mg/kg)					
	Aroclor 1254 (mg/kg)					
	PCB-1254 (mg/kg)					
	Aroclor 1260 (mg/kg)					
	PCB-1260 (mg/kg)					
	Aroclor 1262 (mg/kg)					
	PCB-1262 (mg/kg)					
	Aroclor 1268 (mg/kg)					
	PCB-1268 (mg/kg)					
	Surrogate: Decachlorobiphenyl (%)					
	Total PCBs (mg/kg)					
	Total PCB (BC CSR) (mg/kg)					
	Total Polychlorinated Biphenyls (mg/kg)					
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)	1.07183	0.1740907	0.1177324	0.0904402	0.11999627
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)	1.06843	0.1487107	0.0777674	0.0503852	0.06275977

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1726341-35	L1726341-36	L1726341-37	L1726341-38	L1726341-39
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16
	Sampled Time	16:17	16:30	16:33	16:40	16:47
	Client ID	PCL25 (0-0.5)	PCL25 (0.5-1.0)	PCL25 (1.0-1.5)	PCL25 (1.5-2.0)	PCL25 (2.0-2.5)
Grouping	**Analyte**					
SOIL						
Polycyclic Aromatic Hydrocarbons	Fluorene (mg/kg)	<0.050	<0.050	<0.050		
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050	<0.050		
	Naphthalene (mg/kg)	0.053	<0.050	<0.050		
	Phenanthrene (mg/kg)	0.066	<0.050	<0.050		
	Pyrene (mg/kg)	0.075	<0.050	<0.050		
	Surrogate: Acenaphthene d10 (%)	89.9	89.8	89.5		
	Surrogate: Chrysene d12 (%)	97.8	93.3	108.0		
	Surrogate: Naphthalene d8 (%)	88.5	83.9	89.0		
	Surrogate: Phenanthrene d10 (%)	98.7	98.8	114.1		
	Total PAHs (mg/kg)	0.27	<0.20	<0.20		
Polychlorinated Biphenyls	Aroclor 1016 (mg/kg)	<0.010	<0.010	<0.010		
	PCB-1016 (mg/kg)					
	Aroclor 1221 (mg/kg)	<0.010	<0.010	<0.010		
	PCB-1221 (mg/kg)					
	Aroclor 1232 (mg/kg)	<0.010	<0.010	<0.010		
	PCB-1232 (mg/kg)					
	Aroclor 1242 (mg/kg)	<0.010	<0.010	<0.010		
	PCB-1242 (mg/kg)					
	Aroclor 1248 (mg/kg)	<0.010	<0.010	<0.010		
	PCB-1248 (mg/kg)					
	Aroclor 1254 (mg/kg)	<0.010	<0.010	<0.010		
	PCB-1254 (mg/kg)					
	Aroclor 1260 (mg/kg)	<0.010	<0.010	<0.010		
	PCB-1260 (mg/kg)					
	Aroclor 1262 (mg/kg)	<0.010	<0.010	<0.010		
	PCB-1262 (mg/kg)					
	Aroclor 1268 (mg/kg)	<0.010	<0.010	<0.010		
	PCB-1268 (mg/kg)					
	Surrogate: Decachlorobiphenyl (%)	N/A SMI	N/A SMI	N/A SMI		
	Total PCBs (mg/kg)	<0.020	<0.020	<0.020		
	Total PCB (BC CSR) (mg/kg)					
	Total Polychlorinated Biphenyls (mg/kg)					
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)					
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1726341-40				
	Description	Sediment				
	Sampled Date	20-JAN-16				
	Sampled Time					
	Client ID	SPLIT 5 (0-0.075)				
Grouping	**Analyte**					
SOIL						
Polycyclic Aromatic Hydrocarbons	Fluorene (mg/kg)	<0.050				
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050				
	Naphthalene (mg/kg)	<0.050				
	Phenanthrene (mg/kg)	<0.050				
	Pyrene (mg/kg)	<0.050				
	Surrogate: Acenaphthene d10 (%)	90.3				
	Surrogate: Chrysene d12 (%)	102.7				
	Surrogate: Naphthalene d8 (%)	88.3				
	Surrogate: Phenanthrene d10 (%)	102.8				
	Total PAHs (mg/kg)	<0.20				
Polychlorinated Biphenyls	Aroclor 1016 (mg/kg)	<0.010				
	PCB-1016 (mg/kg)					
	Aroclor 1221 (mg/kg)	<0.010				
	PCB-1221 (mg/kg)					
	Aroclor 1232 (mg/kg)	<0.010				
	PCB-1232 (mg/kg)					
	Aroclor 1242 (mg/kg)	<0.010				
	PCB-1242 (mg/kg)					
	Aroclor 1248 (mg/kg)	<0.010				
	PCB-1248 (mg/kg)					
	Aroclor 1254 (mg/kg)	<0.010				
	PCB-1254 (mg/kg)					
	Aroclor 1260 (mg/kg)	<0.010				
	PCB-1260 (mg/kg)					
	Aroclor 1262 (mg/kg)	<0.010				
	PCB-1262 (mg/kg)					
	Aroclor 1268 (mg/kg)	<0.010				
	PCB-1268 (mg/kg)					
	Surrogate: Decachlorobiphenyl (%)	N/A SMI				
	Total PCBs (mg/kg)	<0.020				
	Total PCB (BC CSR) (mg/kg)					
	Total Polychlorinated Biphenyls (mg/kg)					
Dioxins and Furans	WHO1998 Fish Upper PCDD/F TEQ (ND=EDL) (pg/g)					
	WHO1998 Fish Mid PCDD/F TEQ (ND=1/2EDL) (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1726341-1	L1726341-2	L1726341-3	L1726341-4	L1726341-5
Description	Sediment	Sediment	Sediment	Sediment	Sediment
Sampled Date	19-JAN-16	19-JAN-16	19-JAN-16	19-JAN-16	19-JAN-16
Sampled Time	11:50	11:57	12:03	12:05	12:10
Client ID	PCS10 (0-0.2)	PCS10 (0.2-0.4)	PCS10 (0.4-0.6)	PCS10 (0.6-0.8)	PCS10 (0.8-1.0)
Grouping / **Analyte**					
SOIL					
Dioxins and WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)	0.351142	0.003821	0	0.00892	0
WHO1998 Fish Lower Bound TEQ (ND=0) (pg/g)	0.351142	0.003821	0	0.00892	0
WHO1998 Fish Mid Bound TEQ (ND=1/2EDL) (pg/g)	0.449942	0.240071	0.20441	0.2105085	0.19253965
WHO1998 Fish Upper Bound TEQ (ND=EDL) (pg/g)	0.483242	0.455421	0.408799	0.412079	0.3850793
2,3,7,8-TCDD (pg/g)	0.094 M,J	<0.14 [U]	<0.18 [U]	<0.17 [U]	<0.18 [U]
1,2,3,7,8-PeCDD (pg/g)	0.091 [J]	<0.13 [U]	<0.10 [U]	<0.12 [U]	<0.087 [U]
1,2,3,4,7,8-HxCDD (pg/g)	<0.098 [U]	<0.13 [U]	<0.11 [U]	<0.089 [U]	<0.095 [U]
1,2,3,6,7,8-HxCDD (pg/g)	0.770 J,R	<0.12 M,U	<0.10 [U]	<0.084 [U]	<0.086 [U]
1,2,3,7,8,9-HxCDD (pg/g)	0.210 M,J,R	<0.12 M,U	<0.11 [U]	<0.086 [U]	<0.089 [U]
1,2,3,4,6,7,8-HpCDD (pg/g)	4.13	1.43 [J]	<0.095 [U]	<0.14 [U]	<0.12 [U]
OCDD (pg/g)	22.4	22.1	0.21 M,J,R	0.18 M,J,R	<0.083 M,U
Total-TCDD (pg/g)	0.360	<0.14 [U]	<0.18 [U]	<0.17 [U]	<0.18 [U]
Total TCDD # Homologues	2	0	0	0	0
Total-PeCDD (pg/g)	0.177	<0.13 [U]	<0.10 [U]	<0.12 [U]	<0.087 [U]
Total PeCDD # Homologues	2	0	0	0	0
Total-HxCDD (pg/g)	4.16	0.23	<0.11 [U]	<0.089 [U]	<0.095 [U]
Total HxCDD # Homologues	2	1	0	0	0
Total-HpCDD (pg/g)	8.80	3.07	<0.095 [U]	<0.14 [U]	<0.12 [U]
Total HpCDD # Homologues	2	2	0	0	0
2,3,7,8-TCDF (pg/g)	3.02	0.35 J,R	<0.16 [U]	<0.13 [U]	<0.15 [U]
1,2,3,7,8-PeCDF (pg/g)	0.084 M,J,R	<0.088 [U]	<0.070 [U]	<0.075 [U]	<0.065 [U]
2,3,4,7,8-PeCDF (pg/g)	0.086 M,J,R	<0.084 [U]	<0.070 [U]	<0.076 [U]	<0.061 [U]
1,2,3,4,7,8-HxCDF (pg/g)	<0.052 [U]	<0.11 [U]	<0.055 [U]	<0.059 [U]	<0.062 [U]
1,2,3,6,7,8-HxCDF (pg/g)	<0.048 [U]	<0.098 [U]	<0.045 [U]	<0.053 [U]	<0.053 [U]
1,2,3,7,8,9-HxCDF (pg/g)	<0.070 [U]	<0.14 [U]	<0.078 M,U	0.089 M,J	<0.090 [U]
2,3,4,6,7,8-HxCDF (pg/g)	0.085 M,J,R	<0.11 [U]	<0.057 [U]	<0.058 [U]	<0.056 [U]
1,2,3,4,6,7,8-HpCDF (pg/g)	0.790 [J]	0.340 J,R	<0.063 [U]	<0.060 [U]	<0.054 [U]
1,2,3,4,7,8,9-HpCDF (pg/g)	<0.060 [U]	<0.11 [U]	<0.094 [U]	<0.094 [U]	<0.080 [U]
OCDF (pg/g)	1.72 [J]	1.81 M,J	<0.13 [U]	<0.11 [U]	<0.11 [U]
Total-TCDF (pg/g)	5.26	<0.14 [U]	0.29	<0.13 [U]	<0.15 [U]
Total TCDF # Homologues	7	0	1	0	0
Total-PeCDF (pg/g)	<0.049 [U]	<0.088 [U]	<0.070 [U]	<0.076 [U]	<0.065 [U]
Total PeCDF # Homologues	0	0	0	0	0
Total-HxCDF (pg/g)	0.539	0.25	<0.078 [U]	0.089	<0.090 [U]
Total HxCDF # Homologues	2	1	0	1	0

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1726341-8	L1726341-9	L1726341-10	L1726341-11	L1726341-12
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	19-JAN-16	19-JAN-16	19-JAN-16	19-JAN-16	19-JAN-16
	Sampled Time	12:32	12:41	12:47	12:56	
	Client ID	PCL10 (0-0.5)	PCL10 (0.5-1.0)	PCL10 (1.0-1.5)	PCL10 (1.5-1.86)	SPLIT 3 (0-0.5)
Grouping	**Analyte**					
SOIL						
Dioxins and	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)					
	WHO1998 Fish Lower Bound TEQ (ND=0) (pg/g)					
	WHO1998 Fish Mid Bound TEQ (ND=1/2EDL) (pg/g)					
	WHO1998 Fish Upper Bound TEQ (ND=EDL) (pg/g)					
	2,3,7,8-TCDD (pg/g)					
	1,2,3,7,8-PeCDD (pg/g)					
	1,2,3,4,7,8-HxCDD (pg/g)					
	1,2,3,6,7,8-HxCDD (pg/g)					
	1,2,3,7,8,9-HxCDD (pg/g)					
	1,2,3,4,6,7,8-HpCDD (pg/g)					
	OCDD (pg/g)					
	Total-TCDD (pg/g)					
	Total TCDD # Homologues					
	Total-PeCDD (pg/g)					
	Total PeCDD # Homologues					
	Total-HxCDD (pg/g)					
	Total HxCDD # Homologues					
	Total-HpCDD (pg/g)					
	Total HpCDD # Homologues					
	2,3,7,8-TCDF (pg/g)					
	1,2,3,7,8-PeCDF (pg/g)					
	2,3,4,7,8-PeCDF (pg/g)					
	1,2,3,4,7,8-HxCDF (pg/g)					
	1,2,3,6,7,8-HxCDF (pg/g)					
	1,2,3,7,8,9-HxCDF (pg/g)					
	2,3,4,6,7,8-HxCDF (pg/g)					
	1,2,3,4,6,7,8-HpCDF (pg/g)					
	1,2,3,4,7,8,9-HpCDF (pg/g)					
	OCDF (pg/g)					
	Total-TCDF (pg/g)					
	Total TCDF # Homologues					
	Total-PeCDF (pg/g)					
	Total PeCDF # Homologues					
	Total-HxCDF (pg/g)					
	Total HxCDF # Homologues					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1726341-13	L1726341-14	L1726341-15	L1726341-16	L1726341-17
Description	Sediment	Sediment	Sediment	Sediment	Sediment
Sampled Date	19-JAN-16	19-JAN-16	19-JAN-16	19-JAN-16	19-JAN-16
Sampled Time				14:26	15:41
Client ID	SPLIT 3 (0.5-1.0)	SPLIT 3 (1.0-1.5)	SPLIT 3 (1.5-1.86)	PCS21 (0-0.2)	PCS33 (0-0.2)
Grouping / **Analyte**					
SOIL					
Dioxins and WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)				0.040697	0.000222
WHO1998 Fish Lower Bound TEQ (ND=0) (pg/g)				0.040697	0.000222
WHO1998 Fish Mid Bound TEQ (ND=1/2EDL) (pg/g)				0.415489	0.3479815
WHO1998 Fish Upper Bound TEQ (ND=EDL) (pg/g)				0.787439	0.679941
2,3,7,8-TCDD (pg/g)				<0.24 [U]	<0.24 [U]
1,2,3,7,8-PeCDD (pg/g)				<0.19 [U]	<0.17 [U]
1,2,3,4,7,8-HxCDD (pg/g)				<0.39 [U]	<0.25 [U]
1,2,3,6,7,8-HxCDD (pg/g)				<0.35 [U]	<0.22 [U]
1,2,3,7,8,9-HxCDD (pg/g)				<0.36 [U]	<0.23 [U]
1,2,3,4,6,7,8-HpCDD (pg/g)				1.41 [M,J]	0.30 [M,J,R]
OCDD (pg/g)				8.37	2.22 [M,J]
Total-TCDD (pg/g)				<0.24 [U]	<0.24 [U]
Total TCDD # Homologues				0	0
Total-PeCDD (pg/g)				<0.19 [U]	<0.17 [U]
Total PeCDD # Homologues				0	0
Total-HxCDD (pg/g)				2.01	<0.25 [U]
Total HxCDD # Homologues				2	0
Total-HpCDD (pg/g)				1.41	<0.28 [U]
Total HpCDD # Homologues				1	0
2,3,7,8-TCDF (pg/g)				0.77 [M]	0.31 [J,R]
1,2,3,7,8-PeCDF (pg/g)				<0.11 [U]	<0.14 [U]
2,3,4,7,8-PeCDF (pg/g)				<0.11 [U]	<0.13 [U]
1,2,3,4,7,8-HxCDF (pg/g)				<0.12 [U]	<0.11 [U]
1,2,3,6,7,8-HxCDF (pg/g)				<0.099 [U]	<0.11 [U]
1,2,3,7,8,9-HxCDF (pg/g)				<0.16 [U]	<0.16 [U]
2,3,4,6,7,8-HxCDF (pg/g)				<0.12 [M,U]	<0.11 [U]
1,2,3,4,6,7,8-HpCDF (pg/g)				0.280 [M,J,R]	<0.14 [M,U]
1,2,3,4,7,8,9-HpCDF (pg/g)				<0.14 [U]	<0.20 [U]
OCDF (pg/g)				0.42 [M,J,R]	<0.19 [U]
Total-TCDF (pg/g)				0.77	<0.28 [U]
Total TCDF # Homologues				1	0
Total-PeCDF (pg/g)				<0.11 [U]	<0.14 [U]
Total PeCDF # Homologues				0	0
Total-HxCDF (pg/g)				0.18	<0.16 [U]
Total HxCDF # Homologues				1	0

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1726341-18	L1726341-19	L1726341-20	L1726341-21	L1726341-22
Description	Sediment	Sediment	Sediment	Sediment	Sediment
Sampled Date	19-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16
Sampled Time	15:46	10:17	10:23	10:29	
Client ID	PCL33 (0-0.5)	PCS19 (0-0.2)	PCS19 (0.2-0.4)	PCS19 (0.4-0.65)	SPLIT 4 (0-0.2)
Grouping **Analyte**					
SOIL					
Dioxins and WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)		0.0002333	0	0	0.000094
WHO1998 Fish Lower Bound TEQ (ND=0) (pg/g)		0.0002333	0	0	0.000094
WHO1998 Fish Mid Bound TEQ (ND=1/2EDL) (pg/g)		0.3798033	0.1408087	0.08301855	0.141032
WHO1998 Fish Upper Bound TEQ (ND=EDL) (pg/g)		0.7592033	0.2815984	0.1660305	0.271767
2,3,7,8-TCDD (pg/g)		<0.31 [U]	<0.11 [U]	<0.056 [U]	<0.075 [U]
1,2,3,7,8-PeCDD (pg/g)		<0.17 [U]	<0.077 [U]	<0.040 [U]	<0.071 [U]
1,2,3,4,7,8-HxCDD (pg/g)		<0.20 [U]	<0.076 [U]	<0.063 [U]	<0.12 [U]
1,2,3,6,7,8-HxCDD (pg/g)		<0.16 [M,U]	<0.066 [U]	<0.058 [U]	<0.11 [M,U]
1,2,3,7,8,9-HxCDD (pg/g)		<0.18 [U]	<0.070 [U]	<0.060 [U]	<0.12 [U]
1,2,3,4,6,7,8-HpCDD (pg/g)		0.17 [M,J,R]	<0.12 [U]	<0.049 [U]	0.19 [M,J,R]
OCDD (pg/g)		1.98 [J]	0.19 [M,J,R]	0.066 [M,J,R]	0.94 [J]
Total-TCDD (pg/g)		<0.31 [U]	<0.11 [U]	<0.056 [U]	<0.075 [U]
Total TCDD # Homologues		0	0	0	0
Total-PeCDD (pg/g)		<0.17 [U]	<0.077 [U]	<0.040 [U]	<0.071 [U]
Total PeCDD # Homologues		0	0	0	0
Total-HxCDD (pg/g)		<0.20 [U]	<0.076 [U]	<0.063 [U]	0.36
Total HxCDD # Homologues		0	0	0	2
Total-HpCDD (pg/g)		0.27	<0.12 [U]	<0.049 [U]	0.23
Total HpCDD # Homologues		1	0	0	1
2,3,7,8-TCDF (pg/g)		<0.29 [U]	<0.088 [U]	<0.052 [U]	0.200 [M,J,R]
1,2,3,7,8-PeCDF (pg/g)		<0.17 [U]	<0.049 [M,U]	<0.042 [U]	<0.050 [U]
2,3,4,7,8-PeCDF (pg/g)		<0.17 [U]	<0.048 [U]	<0.039 [U]	<0.050 [U]
1,2,3,4,7,8-HxCDF (pg/g)		<0.14 [U]	<0.050 [U]	<0.027 [U]	<0.057 [U]
1,2,3,6,7,8-HxCDF (pg/g)		<0.12 [U]	<0.045 [M,U]	<0.026 [U]	<0.052 [U]
1,2,3,7,8,9-HxCDF (pg/g)		<0.22 [U]	<0.073 [M,U]	<0.038 [M,U]	<0.078 [M,U]
2,3,4,6,7,8-HxCDF (pg/g)		<0.14 [U]	<0.054 [M,U]	<0.028 [M,U]	<0.056 [U]
1,2,3,4,6,7,8-HpCDF (pg/g)		<0.21 [U]	<0.084 [U]	<0.048 [U]	<0.055 [U]
1,2,3,4,7,8,9-HpCDF (pg/g)		<0.33 [U]	<0.12 [U]	<0.071 [U]	<0.082 [U]
OCDF (pg/g)		0.35 [M,J]	<0.094 [M,U]	<0.049 [M,U]	0.13 [M,J,R]
Total-TCDF (pg/g)		<0.29 [U]	<0.088 [U]	0.086	0.147
Total TCDF # Homologues		0	0	1	1
Total-PeCDF (pg/g)		<0.17 [U]	<0.049 [U]	<0.042 [U]	<0.050 [U]
Total PeCDF # Homologues		0	0	0	0
Total-HxCDF (pg/g)		<0.22 [U]	<0.073 [U]	<0.038 [U]	<0.078 [U]
Total HxCDF # Homologues		0	0	0	0

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

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Sample ID	L1726341-23	L1726341-24	L1726341-25	L1726341-26	L1726341-27
Description	Sediment	Sediment	Sediment	Sediment	Sediment
Sampled Date	20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16
Sampled Time			12:31	12:51	13:15
Client ID	SPLIT 4 (0.2-0.4)	SPLIT 4 (0.4-0.65)	SS03 (0-0.075)	SS02 (0-0.075)	SS01 (0-0.075)
Grouping **Analyte**					
SOIL					
Dioxins and WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)	0.0000233	0			
WHO1998 Fish Lower Bound TEQ (ND=0) (pg/g)	0.0000233	0			
WHO1998 Fish Mid Bound TEQ (ND=1/2EDL) (pg/g)	0.1243783	0.1035926			
WHO1998 Fish Upper Bound TEQ (ND=EDL) (pg/g)	0.2487333	0.2071852			
2,3,7,8-TCDD (pg/g)	<0.083 [U]	<0.068 [U]			
1,2,3,7,8-PeCDD (pg/g)	<0.068 [U]	<0.055 [U]			
1,2,3,4,7,8-HxCDD (pg/g)	<0.095 [U]	<0.074 [U]			
1,2,3,6,7,8-HxCDD (pg/g)	<0.089 [U]	<0.069 [U]			
1,2,3,7,8,9-HxCDD (pg/g)	<0.091 [U]	<0.071 [U]			
1,2,3,4,6,7,8-HpCDD (pg/g)	<0.083 [M,U]	<0.099 [U]			
OCDD (pg/g)	0.233 [J]	<0.085 [M,U]			
Total-TCDD (pg/g)	<0.083 [U]	<0.068 [U]			
Total TCDD # Homologues	0	0			
Total-PeCDD (pg/g)	<0.068 [U]	<0.055 [U]			
Total PeCDD # Homologues	0	0			
Total-HxCDD (pg/g)	<0.095 [U]	<0.074 [U]			
Total HxCDD # Homologues	0	0			
Total-HpCDD (pg/g)	<0.083 [U]	<0.099 [U]			
Total HpCDD # Homologues	0	0			
2,3,7,8-TCDF (pg/g)	<0.066 [U]	<0.075 [U]			
1,2,3,7,8-PeCDF (pg/g)	<0.049 [U]	<0.045 [U]			
2,3,4,7,8-PeCDF (pg/g)	<0.051 [U]	<0.045 [U]			
1,2,3,4,7,8-HxCDF (pg/g)	<0.035 [U]	<0.037 [U]			
1,2,3,6,7,8-HxCDF (pg/g)	<0.033 [U]	<0.032 [U]			
1,2,3,7,8,9-HxCDF (pg/g)	<0.053 [M,U]	<0.056 [U]			
2,3,4,6,7,8-HxCDF (pg/g)	<0.037 [M,U]	<0.036 [U]			
1,2,3,4,6,7,8-HpCDF (pg/g)	<0.051 [U]	<0.041 [U]			
1,2,3,4,7,8,9-HpCDF (pg/g)	<0.076 [U]	<0.066 [U]			
OCDF (pg/g)	<0.070 [U]	<0.077 [M,U]			
Total-TCDF (pg/g)	<0.066 [U]	<0.075 [U]			
Total TCDF # Homologues	0	0			
Total-PeCDF (pg/g)	<0.051 [U]	<0.045 [U]			
Total PeCDF # Homologues	0	0			
Total-HxCDF (pg/g)	<0.053 [U]	<0.056 [U]			
Total HxCDF # Homologues	0	0			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1726341-28 Sediment 20-JAN-16 15:42 PCS25 (0-0.2)	L1726341-29 Sediment 20-JAN-16 15:45 PCS25 (0.2-0.4)	L1726341-30 Sediment 20-JAN-16 15:49 PCS25 (0.4-0.6)	L1726341-31 Sediment 20-JAN-16 15:53 PCS25 (0.6-0.8)	L1726341-32 Sediment 20-JAN-16 15:59 PCS25 (0.8-1.0)
SOIL						
Dioxins and	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)	0.55473	0.0372707	0.003005	0.0020366	0.00516727
	WHO1998 Fish Lower Bound TEQ (ND=0) (pg/g)	0.55473	0.0372707	0.003005	0.0020366	0.00516727
	WHO1998 Fish Mid Bound TEQ (ND=1/2EDL) (pg/g)	1.06843	0.1487107	0.0777674	0.0503852	0.06275977
	WHO1998 Fish Upper Bound TEQ (ND=EDL) (pg/g)	1.07183	0.1740907	0.1177324	0.0904402	0.11999627
	2,3,7,8-TCDD (pg/g)	0.180 M,J,R	<0.044 [U]	<0.047 [U]	<0.035 [U]	<0.047 [U]
	1,2,3,7,8-PeCDD (pg/g)	0.300 M,J,R	0.051 M,J,R	0.031 M,J,R	<0.021 [U]	<0.031 [U]
	1,2,3,4,7,8-HxCDD (pg/g)	0.084 [J]	0.057 M,J	<0.026 M,U	<0.022 [U]	<0.030 [U]
	1,2,3,6,7,8-HxCDD (pg/g)	2.75 [J]	0.210 M,J	<0.026 M,U	<0.021 [U]	<0.029 [U]
	1,2,3,7,8,9-HxCDD (pg/g)	1.14 [J]	0.117 M,J	<0.026 [U]	0.023 M,J,R	<0.029 [U]
	1,2,3,4,6,7,8-HpCDD (pg/g)	8.53	0.560 M,J,R	0.071 M,J,R	0.095 [J]	<0.023 M,J,R
	OCDD (pg/g)	48.3	3.45 [J]	0.390 J,R	0.323 [J]	0.160 J,R
	Total-TCDD (pg/g)	0.306	<0.044 [U]	<0.047 [U]	<0.035 [U]	<0.047 [U]
	Total TCDD # Homologues	1	0	0	0	0
	Total-PeCDD (pg/g)	1.33	<0.035 [U]	<0.027 [U]	<0.021 [U]	<0.031 [U]
	Total PeCDD # Homologues	5	0	0	0	0
	Total-HxCDD (pg/g)	20.6	0.384	<0.026 [U]	<0.022 [U]	<0.030 [U]
	Total HxCDD # Homologues	6	3	0	0	0
	Total-HpCDD (pg/g)	19.0	0.527	<0.029 [U]	0.190	<0.023 [U]
	Total HpCDD # Homologues	2	1	0	2	0
	2,3,7,8-TCDF (pg/g)	6.46	0.080 M,J,R	0.060 M,J	0.120 M,J,R	<0.035 [U]
	1,2,3,7,8-PeCDF (pg/g)	0.145 M,J	0.069 M,J	<0.022 [U]	<0.018 [U]	<0.019 [U]
	2,3,4,7,8-PeCDF (pg/g)	0.217 [J]	0.039 J,R	<0.021 [U]	<0.017 M,J,R	<0.019 [U]
	1,2,3,4,7,8-HxCDF (pg/g)	0.100 M,J,R	<0.034 M,U	<0.027 [U]	0.017 M,J	<0.029 [U]
	1,2,3,6,7,8-HxCDF (pg/g)	0.092 M,J,R	0.034 J,R	<0.025 [U]	0.019 M,J,R	<0.027 [U]
	1,2,3,7,8,9-HxCDF (pg/g)	<0.068 M,U	0.076 M,J,R	0.033 M,J,R	<0.020 M,U	0.052 M,J
	2,3,4,6,7,8-HxCDF (pg/g)	0.100 M,J,R	<0.031 M,U	<0.024 M,U	<0.015 M,U	<0.028 M,U
	1,2,3,4,6,7,8-HpCDF (pg/g)	2.11 [J]	0.165 [J]	0.038 M,J,R	0.0229 M,J	0.034 M,J,R
	1,2,3,4,7,8,9-HpCDF (pg/g)	0.110 M,J,R	<0.026 [U]	<0.021 [U]	0.016 M,J,R	<0.027 [U]
	OCDF (pg/g)	6.20 [J]	0.407 [J]	0.074 J,R	0.036 M,J,R	0.073 [J]
	Total-TCDF (pg/g)	11.6	<0.038 [U]	0.060	0.279	<0.035 [U]
	Total TCDF # Homologues	6	0	1	2	0
	Total-PeCDF (pg/g)	1.64	0.069	<0.022 [U]	<0.018 [U]	<0.019 [U]
	Total PeCDF # Homologues	4	1	0	0	0
	Total-HxCDF (pg/g)	2.44	<0.042 [U]	<0.031 [U]	<0.020 [U]	0.052
	Total HxCDF # Homologues	2	0	0	0	1

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1726341-35	L1726341-36	L1726341-37	L1726341-38	L1726341-39
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16
	Sampled Time	16:17	16:30	16:33	16:40	16:47
	Client ID	PCL25 (0-0.5)	PCL25 (0.5-1.0)	PCL25 (1.0-1.5)	PCL25 (1.5-2.0)	PCL25 (2.0-2.5)
Grouping	**Analyte**					
SOIL						
Dioxins and	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)					
	WHO1998 Fish Lower Bound TEQ (ND=0) (pg/g)					
	WHO1998 Fish Mid Bound TEQ (ND=1/2EDL) (pg/g)					
	WHO1998 Fish Upper Bound TEQ (ND=EDL) (pg/g)					
	2,3,7,8-TCDD (pg/g)					
	1,2,3,7,8-PeCDD (pg/g)					
	1,2,3,4,7,8-HxCDD (pg/g)					
	1,2,3,6,7,8-HxCDD (pg/g)					
	1,2,3,7,8,9-HxCDD (pg/g)					
	1,2,3,4,6,7,8-HpCDD (pg/g)					
	OCDD (pg/g)					
	Total-TCDD (pg/g)					
	Total TCDD # Homologues					
	Total-PeCDD (pg/g)					
	Total PeCDD # Homologues					
	Total-HxCDD (pg/g)					
	Total HxCDD # Homologues					
	Total-HpCDD (pg/g)					
	Total HpCDD # Homologues					
	2,3,7,8-TCDF (pg/g)					
	1,2,3,7,8-PeCDF (pg/g)					
	2,3,4,7,8-PeCDF (pg/g)					
	1,2,3,4,7,8-HxCDF (pg/g)					
	1,2,3,6,7,8-HxCDF (pg/g)					
	1,2,3,7,8,9-HxCDF (pg/g)					
	2,3,4,6,7,8-HxCDF (pg/g)					
	1,2,3,4,6,7,8-HpCDF (pg/g)					
	1,2,3,4,7,8,9-HpCDF (pg/g)					
	OCDF (pg/g)					
	Total-TCDF (pg/g)					
	Total TCDF # Homologues					
	Total-PeCDF (pg/g)					
	Total PeCDF # Homologues					
	Total-HxCDF (pg/g)					
	Total HxCDF # Homologues					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1726341-40				
	Description	Sediment				
	Sampled Date	20-JAN-16				
	Sampled Time					
	Client ID	SPLIT 5 (0-0.075)				
Grouping	**Analyte**					
SOIL						
Dioxins and	WHO1998 Fish Lower PCDD/F TEQ (ND=0) (pg/g)					
	WHO1998 Fish Lower Bound TEQ (ND=0) (pg/g)					
	WHO1998 Fish Mid Bound TEQ (ND=1/2EDL) (pg/g)					
	WHO1998 Fish Upper Bound TEQ (ND=EDL) (pg/g)					
	2,3,7,8-TCDD (pg/g)					
	1,2,3,7,8-PeCDD (pg/g)					
	1,2,3,4,7,8-HxCDD (pg/g)					
	1,2,3,6,7,8-HxCDD (pg/g)					
	1,2,3,7,8,9-HxCDD (pg/g)					
	1,2,3,4,6,7,8-HpCDD (pg/g)					
	OCDD (pg/g)					
	Total-TCDD (pg/g)					
	Total TCDD # Homologues					
	Total-PeCDD (pg/g)					
	Total PeCDD # Homologues					
	Total-HxCDD (pg/g)					
	Total HxCDD # Homologues					
	Total-HpCDD (pg/g)					
	Total HpCDD # Homologues					
	2,3,7,8-TCDF (pg/g)					
	1,2,3,7,8-PeCDF (pg/g)					
	2,3,4,7,8-PeCDF (pg/g)					
	1,2,3,4,7,8-HxCDF (pg/g)					
	1,2,3,6,7,8-HxCDF (pg/g)					
	1,2,3,7,8,9-HxCDF (pg/g)					
	2,3,4,6,7,8-HxCDF (pg/g)					
	1,2,3,4,6,7,8-HpCDF (pg/g)					
	1,2,3,4,7,8,9-HpCDF (pg/g)					
	OCDF (pg/g)					
	Total-TCDF (pg/g)					
	Total TCDF # Homologues					
	Total-PeCDF (pg/g)					
	Total PeCDF # Homologues					
	Total-HxCDF (pg/g)					
	Total HxCDF # Homologues					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1726341-1	L1726341-2	L1726341-3	L1726341-4	L1726341-5
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	19-JAN-16	19-JAN-16	19-JAN-16	19-JAN-16	19-JAN-16
	Sampled Time	11:50	11:57	12:03	12:05	12:10
	Client ID	PCS10 (0-0.2)	PCS10 (0.2-0.4)	PCS10 (0.4-0.6)	PCS10 (0.6-0.8)	PCS10 (0.8-1.0)
Grouping	**Analyte**					
SOIL						
Dioxins and	Total-HpCDF (pg/g)	2.15	<0.11 [U]	<0.094 [U]	<0.094 [U]	<0.080 [U]
	Total HpCDF # Homologues	2	0	0	0	0
	Surrogate: 13C12-2,3,7,8-TCDD (%)	75.0	63.0	63.0	69.0	68.0
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)	63.0	51.0	50.0	55.0	54.0
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)	86.0	67.0	70.0	69.0	74.0
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)	98.0	84.0	92.0	93.0	94.0
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)	90.0	81.0	86.0	78.0	86.0
	Surrogate: 13C12-OCDD (%)	85.0	78.0	83.0	75.0	81.0
	Surrogate: 13C12-2,3,7,8-TCDF (%)	73.0	63.0	65.0	69.0	70.0
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)	65.0	57.0	56.0	63.0	61.0
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)	62.0	51.0	52.0	56.0	57.0
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)	86.0	70.0	77.0	75.0	81.0
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)	98.0	90.0	98.0	94.0	104.0
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)	95.0	77.0	81.0	80.0	84.0
	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)	88.0	75.0	77.0	75.0	85.0
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)	88.0	85.0	89.0	86.0	91.0
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)	86.0	86.0	92.0	88.0	90.0
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)	66.0	52.0	58.0	52.0	56.0
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.544	0.0215	0.00	0.00892	0.00
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)	0.693	0.251	0.189	0.196	0.179
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.706	0.442	0.377	0.383	0.358

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1726341-8	L1726341-9	L1726341-10	L1726341-11	L1726341-12
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	19-JAN-16	19-JAN-16	19-JAN-16	19-JAN-16	19-JAN-16
	Sampled Time	12:32	12:41	12:47	12:56	
	Client ID	PCL10 (0-0.5)	PCL10 (0.5-1.0)	PCL10 (1.0-1.5)	PCL10 (1.5-1.86)	SPLIT 3 (0-0.5)
Grouping	**Analyte**					
SOIL						
Dioxins and	Total-HpCDF (pg/g)					
	Total HpCDF # Homologues					
	Surrogate: 13C12-2,3,7,8-TCDD (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)					
	Surrogate: 13C12-OCDD (%)					
	Surrogate: 13C12-2,3,7,8-TCDF (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)					
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)					
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)					
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)					
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)					
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)					
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1726341-13	L1726341-14	L1726341-15	L1726341-16	L1726341-17
Description	Sediment	Sediment	Sediment	Sediment	Sediment
Sampled Date	19-JAN-16	19-JAN-16	19-JAN-16	19-JAN-16	19-JAN-16
Sampled Time				14:26	15:41
Client ID	SPLIT 3 (0.5-1.0)	SPLIT 3 (1.0-1.5)	SPLIT 3 (1.5-1.86)	PCS21 (0-0.2)	PCS33 (0-0.2)
Grouping / **Analyte**					
SOIL					
Dioxins and Total-HpCDF (pg/g)				<0.14 [U]	<0.20 [U]
Total HpCDF # Homologues				0	0
Surrogate: 13C12-2,3,7,8-TCDD (%)				63.0	60.0
Surrogate: 13C12-1,2,3,7,8-PeCDD (%)				51.0	49.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)				71.0	65.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)				90.0	88.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)				81.0	76.0
Surrogate: 13C12-OCDD (%)				75.0	76.0
Surrogate: 13C12-2,3,7,8-TCDF (%)				66.0	61.0
Surrogate: 13C12-1,2,3,7,8-PeCDF (%)				58.0	53.0
Surrogate: 13C12-2,3,4,7,8-PeCDF (%)				55.0	50.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)				76.0	72.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)				99.0	95.0
Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)				85.0	79.0
Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)				77.0	73.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)				92.0	85.0
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)				88.0	86.0
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)				55.0	53.0
Toxic Equivalency Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)				0.0935	0.000666
Mid Point PCDD/F TEQ (WHO 2005) (pg/g)				0.410	0.322
Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)				0.724	0.610

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1726341-18	L1726341-19	L1726341-20	L1726341-21	L1726341-22
Description	Sediment	Sediment	Sediment	Sediment	Sediment
Sampled Date	19-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16
Sampled Time	15:46	10:17	10:23	10:29	
Client ID	PCL33 (0-0.5)	PCS19 (0-0.2)	PCS19 (0.2-0.4)	PCS19 (0.4-0.65)	SPLIT 4 (0-0.2)
Grouping / **Analyte**					
SOIL					
Dioxins and Total-HpCDF (pg/g)		<0.33 [U]	<0.12 [U]	<0.071 [U]	<0.082 [U]
Total HpCDF # Homologues		0	0	0	0
Surrogate: 13C12-2,3,7,8-TCDD (%)		57.0	72.0	68.0	65.0
Surrogate: 13C12-1,2,3,7,8-PeCDD (%)		43.0	55.0	50.0	47.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)		64.0	83.0	72.0	78.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)		87.0	95.0	84.0	91.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)		73.0	73.0	66.0	68.0
Surrogate: 13C12-OCDD (%)		64.0	79.0	64.0	68.0
Surrogate: 13C12-2,3,7,8-TCDF (%)		56.0	67.0	64.0	62.0
Surrogate: 13C12-1,2,3,7,8-PeCDF (%)		53.0	57.0	53.0	51.0
Surrogate: 13C12-2,3,4,7,8-PeCDF (%)		44.0	51.0	48.0	45.0
Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)		64.0	79.0	73.0	78.0
Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)		94.0	94.0	84.0	93.0
Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)		73.0	82.0	74.0	82.0
Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)		62.0	76.0	69.0	76.0
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)		76.0	68.0	56.0	65.0
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)		70.0	65.0	56.0	59.0
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)		45.0	67.0	61.0	60.0
Toxic Equivalency Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)		0.000700	0.00	0.00	0.000282
Mid Point PCDD/F TEQ (WHO 2005) (pg/g)		0.346	0.129	0.0729	0.134
Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)		0.689	0.258	0.146	0.245

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1726341-23	L1726341-24	L1726341-25	L1726341-26	L1726341-27
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16
	Sampled Time			12:31	12:51	13:15
	Client ID	SPLIT 4 (0.2-0.4)	SPLIT 4 (0.4-0.65)	SS03 (0-0.075)	SS02 (0-0.075)	SS01 (0-0.075)
Grouping	**Analyte**					
SOIL						
Dioxins and	Total-HpCDF (pg/g)	<0.076 [U]	<0.066 [U]			
	Total HpCDF # Homologues	0	0			
	Surrogate: 13C12-2,3,7,8-TCDD (%)	67.0	63.0			
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)	50.0	48.0			
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)	76.0	72.0			
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)	95.0	92.0			
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)	70.0	66.0			
	Surrogate: 13C12-OCDD (%)	67.0	64.0			
	Surrogate: 13C12-2,3,7,8-TCDF (%)	63.0	57.0			
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)	53.0	51.0			
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)	45.0	42.0			
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)	76.0	70.0			
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)	96.0	92.0			
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)	78.0	73.0			
	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)	71.0	66.0			
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)	62.0	53.0			
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)	58.0	51.0			
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)	60.0	59.0			
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.0000699	0.00			
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)	0.110	0.0925			
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)	0.220	0.185			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1726341-28	L1726341-29	L1726341-30	L1726341-31	L1726341-32
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16
	Sampled Time	15:42	15:45	15:49	15:53	15:59
	Client ID	PCS25 (0-0.2)	PCS25 (0.2-0.4)	PCS25 (0.4-0.6)	PCS25 (0.6-0.8)	PCS25 (0.8-1.0)
Grouping	**Analyte**					
SOIL						
Dioxins and	Total-HpCDF (pg/g)	6.39	0.363	<0.021 [U]	0.023	<0.027 [U]
	Total HpCDF # Homologues	2	2	0	1	0
	Surrogate: 13C12-2,3,7,8-TCDD (%)	72.0	65.0	73.0	72.0	75.0
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)	61.0	58.0	66.0	63.0	67.0
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)	86.0	81.0	83.0	90.0	83.0
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)	84.0	80.0	84.0	86.0	90.0
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)	77.0	79.0	79.0	85.0	79.0
	Surrogate: 13C12-OCDD (%)	68.0	75.0	76.0	82.0	75.0
	Surrogate: 13C12-2,3,7,8-TCDF (%)	65.0	59.0	66.0	65.0	66.0
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)	60.0	58.0	65.0	65.0	67.0
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)	58.0	55.0	63.0	60.0	60.0
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)	80.0	76.0	75.0	85.0	74.0
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)	78.0	78.0	78.0	86.0	81.0
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)	79.0	78.0	79.0	85.0	77.0
	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)	73.0	73.0	74.0	78.0	71.0
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)	72.0	72.0	72.0	78.0	71.0
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)	73.0	77.0	76.0	79.0	74.0
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)	67.0	57.0	64.0	61.0	66.0
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)	1.24	0.0433	0.00601	0.00296	0.00518
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)	1.75	0.156	0.0763	0.0566	0.0584
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)	1.75	0.181	0.111	0.0888	0.111

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1726341-35	L1726341-36	L1726341-37	L1726341-38	L1726341-39
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16	20-JAN-16
	Sampled Time	16:17	16:30	16:33	16:40	16:47
	Client ID	PCL25 (0-0.5)	PCL25 (0.5-1.0)	PCL25 (1.0-1.5)	PCL25 (1.5-2.0)	PCL25 (2.0-2.5)
Grouping	**Analyte**					
SOIL						
Dioxins and	Total-HpCDF (pg/g)					
	Total HpCDF # Homologues					
	Surrogate: 13C12-2,3,7,8-TCDD (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)					
	Surrogate: 13C12-OCDD (%)					
	Surrogate: 13C12-2,3,7,8-TCDF (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)					
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)					
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)					
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)					
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)					
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)					
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1726341-40				
	Description	Sediment				
	Sampled Date	20-JAN-16				
	Sampled Time					
	Client ID	SPLIT 5 (0-0.075)				
Grouping	**Analyte**					
SOIL						
Dioxins and	Total-HpCDF (pg/g)					
	Total HpCDF # Homologues					
	Surrogate: 13C12-2,3,7,8-TCDD (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDD (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDD (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD (%)					
	Surrogate: 13C12-OCDD (%)					
	Surrogate: 13C12-2,3,7,8-TCDF (%)					
	Surrogate: 13C12-1,2,3,7,8-PeCDF (%)					
	Surrogate: 13C12-2,3,4,7,8-PeCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,6,7,8-HxCDF (%)					
	Surrogate: 13C12-2,3,4,6,7,8-HxCDF (%)					
	Surrogate: 13C12-1,2,3,7,8,9-HxCDF (%)					
	Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF (%)					
	Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF (%)					
	Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup) (%)					
Toxic Equivalency	Lower Bound PCDD/F TEQ (WHO 2005) (pg/g)					
	Mid Point PCDD/F TEQ (WHO 2005) (pg/g)					
	Upper Bound PCDD/F TEQ (WHO 2005) (pg/g)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Total-HxCDF	A	L1726341-1
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.		
Duplicate	Mercury (Hg)	DUP-H	L1726341-10, -12, -13, -14, -16, -18, -25, -26, -27, -35, -36, -37, -40, -8, -9
Duplicate	Copper (Cu)	DUP-H	L1726341-10, -12, -13, -14, -16, -18, -25, -26, -27, -35, -36, -37, -40, -8, -9
Duplicate	Lead (Pb)	DUP-H	L1726341-10, -12, -13, -14, -16, -18, -25, -26, -27, -35, -36, -37, -40, -8, -9
Duplicate	Nickel (Ni)	DUP-H	L1726341-10, -12, -13, -14, -16, -18, -25, -26, -27, -35, -36, -37, -40, -8, -9
Duplicate	Zinc (Zn)	DUP-H	L1726341-10, -12, -13, -14, -16, -18, -25, -26, -27, -35, -36, -37, -40, -8, -9
Duplicate	Chromium (Cr)	DUP-H	L1726341-10, -12, -13, -14, -16, -18, -25, -26, -27, -35, -36, -37, -40, -8, -9
Duplicate	Copper (Cu)	DUP-H	L1726341-10, -12, -13, -14, -16, -18, -25, -26, -27, -35, -36, -37, -40, -8, -9
Duplicate	Lead (Pb)	DUP-H	L1726341-10, -12, -13, -14, -16, -18, -25, -26, -27, -35, -36, -37, -40, -8, -9
Duplicate	Nickel (Ni)	DUP-H	L1726341-10, -12, -13, -14, -16, -18, -25, -26, -27, -35, -36, -37, -40, -8, -9
Duplicate	Zinc (Zn)	DUP-H	L1726341-10, -12, -13, -14, -16, -18, -25, -26, -27, -35, -36, -37, -40, -8, -9
Duplicate	1,2,3,4,6,7,8-HpCDF	G	L1726341-1
Comments:	Sample and duplicate are outside the RPD criteria for select targets. Sample was extracted four times and results show that the sample is not homogenous		
Duplicate	OCDD	G	L1726341-1
Comments:	Sample and duplicate are outside the RPD criteria for select targets. Sample was extracted four times and results show that the sample is not homogenous		
Duplicate	OCDF	G	L1726341-1
Comments:	Sample and duplicate are outside the RPD criteria for select targets. Sample was extracted four times and results show that the sample is not homogenous		
Duplicate	Total-HpCDF	G	L1726341-1
Comments:	Sample and duplicate are outside the RPD criteria for select targets. Sample was extracted four times and results show that the sample is not homogenous		
Duplicate	Total-HxCDD	G	L1726341-1
Comments:	Sample and duplicate are outside the RPD criteria for select targets. Sample was extracted four times and results show that the sample is not homogenous		
Duplicate	Total-HxCDF	G	L1726341-1
Comments:	Sample and duplicate are outside the RPD criteria for select targets. Sample was extracted four times and results show that the sample is not homogenous		
Duplicate	Total-PeCDF	G	L1726341-1
Comments:	Sample and duplicate are outside the RPD criteria for select targets. Sample was extracted four times and results show that the sample is not homogenous		
Duplicate	Total-TCDD	G	L1726341-1
Comments:	Sample and duplicate are outside the RPD criteria for select targets. Sample was extracted four times and results show that the sample is not homogenous		
Duplicate	2,3,4,6,7,8-HxCDF	J,R	L1726341-1
Comments:	Sample and duplicate are outside the RPD criteria for select targets. Sample was extracted four times and results show that the sample is not homogenous		
Method Blank	1,2,3,7,8,9-HxCDF	M,J	L1726341-1
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.		
Duplicate	1,2,3,6,7,8-HxCDD	M,J	L1726341-1
Comments:	Sample and duplicate are outside the RPD criteria for select targets. Sample was extracted four times and results show that the sample is not homogenous		
Duplicate	1,2,3,7,8,9-HxCDD	M,J	L1726341-1
Comments:	Sample and duplicate are outside the RPD criteria for select targets. Sample was extracted four times and results show that the sample is not homogenous		
Method Blank	OCDD	M,J,R	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	OCDF	M,J,R	L1726341-1

Reference Information

	Parameter	Qualifier	Applies to Sample Number(s)
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.		
Duplicate	1,2,3,7,8-PeCDD	M,J,R	L1726341-1
Comments:	Sample and duplicate are outside the RPD criteria for select targets. Sample was extracted four times and results show that the sample is not homogenous		
Duplicate	1,2,3,7,8-PeCDF	M,J,R	L1726341-1
Comments:	Sample and duplicate are outside the RPD criteria for select targets. Sample was extracted four times and results show that the sample is not homogenous		
Duplicate	2,3,4,7,8-PeCDF	M,J,R	L1726341-1
Comments:	Sample and duplicate are outside the RPD criteria for select targets. Sample was extracted four times and results show that the sample is not homogenous		
Duplicate	2,3,7,8-TCDD	M,J,R	L1726341-1
Comments:	Sample and duplicate are outside the RPD criteria for select targets. Sample was extracted four times and results show that the sample is not homogenous		
Method Blank	1,2,3,6,7,8-HxCDF	M,U	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	1,2,3,7,8,9-HxCDF	M,U	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	OCDF	M,U	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	1,2,3,4,6,7,8-HpCDD	M,U	L1726341-1
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.		
Method Blank	1,2,3,4,6,7,8-HpCDF	M,U	L1726341-1
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.		
Method Blank	1,2,3,4,7,8-HxCDF	M,U	L1726341-1
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.		
Method Blank	1,2,3,6,7,8-HxCDF	M,U	L1726341-1
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.		
Method Blank	OCDD	M,U	L1726341-1
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.		
Internal Reference Material	Anthracene	RM-ND	L1726341-10, -13, -14, -16, -18, -26, -27, -36, -37, -8, -9
Internal Reference Material	Benz(a)anthracene	RM-ND	L1726341-10, -13, -14, -16, -18, -26, -27, -36, -37, -8, -9
Internal Reference Material	Benzo(a)pyrene	RM-ND	L1726341-10, -13, -14, -16, -18, -26, -27, -36, -37, -8, -9
Internal Reference Material	Benzo(b)fluoranthene	RM-ND	L1726341-10, -13, -14, -16, -18, -26, -27, -36, -37, -8, -9
Internal Reference Material	Benzo(g,h,i)perylene	RM-ND	L1726341-10, -13, -14, -16, -18, -26, -27, -36, -37, -8, -9
Internal Reference Material	Benzo(k)fluoranthene	RM-ND	L1726341-10, -13, -14, -16, -18, -26, -27, -36, -37, -8, -9
Internal Reference Material	Chrysene	RM-ND	L1726341-10, -13, -14, -16, -18, -26, -27, -36, -37, -8, -9
Internal Reference Material	Dibenz(a,h)anthracene	RM-ND	L1726341-10, -13, -14, -16, -18, -26, -27, -36, -37, -8, -9
Internal Reference Material	Fluorene	RM-ND	L1726341-10, -13, -14, -16, -18, -26, -27, -36, -37, -8, -9
Internal Reference Material	Indeno(1,2,3-c,d)pyrene	RM-ND	L1726341-10, -13, -14, -16, -18, -26, -27, -36, -37, -8, -9
Duplicate	1,2,3,4,6,7,8-HpCDF	[J]	L1726341-1
Comments:	Sample and duplicate are outside the RPD criteria for select targets. Sample was extracted four times and results show that the sample is not homogenous		
Method Blank	1,2,3,4,6,7,8-HpCDD	[U]	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	1,2,3,4,6,7,8-HpCDF	[U]	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	1,2,3,4,7,8,9-HpCDF	[U]	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	1,2,3,4,7,8-HxCDD	[U]	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	1,2,3,4,7,8-HxCDF	[U]	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	1,2,3,6,7,8-HxCDD	[U]	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5

Reference Information

	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	1,2,3,7,8,9-HxCDD	[U]	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	1,2,3,7,8-PeCDD	[U]	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	1,2,3,7,8-PeCDF	[U]	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	2,3,4,6,7,8-HxCDF	[U]	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	2,3,4,7,8-PeCDF	[U]	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	2,3,7,8-TCDD	[U]	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	2,3,7,8-TCDF	[U]	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	Total-HpCDD	[U]	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	Total-HpCDF	[U]	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	Total-HxCDD	[U]	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	Total-HxCDF	[U]	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	Total-PeCDD	[U]	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	Total-PeCDF	[U]	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	Total-TCDD	[U]	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	Total-TCDF	[U]	L1726341-16, -17, -19, -2, -20, -21, -22, -23, -24, -28, -29, -3, -30, -31, -32, -4, -5
Method Blank	1,2,3,4,7,8,9-HpCDF	[U]	L1726341-1

Comments: There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.

Method Blank	1,2,3,4,7,8-HxCDD	[U]	L1726341-1

Comments: There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.

Method Blank	1,2,3,6,7,8-HxCDD	[U]	L1726341-1

Comments: There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.

Method Blank	1,2,3,7,8,9-HxCDD	[U]	L1726341-1

Comments: There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.

Method Blank	1,2,3,7,8-PeCDD	[U]	L1726341-1

Comments: There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.

Method Blank	1,2,3,7,8-PeCDF	[U]	L1726341-1

Comments: There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.

Method Blank	2,3,4,6,7,8-HxCDF	[U]	L1726341-1

Comments: There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.

Method Blank	2,3,4,7,8-PeCDF	[U]	L1726341-1

Comments: There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.

Method Blank	2,3,7,8-TCDD	[U]	L1726341-1

Comments: There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.

Method Blank	2,3,7,8-TCDF	[U]	L1726341-1

Comments: There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.

Method Blank	Total-HpCDD	[U]	L1726341-1

Comments: There were low levels of selected targets detected in the method blank that were within the reference method control limits.

Reference Information

	Parameter	Qualifier	Applies to Sample Number(s)
	Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.		
Method Blank	Total-HpCDF	[U]	L1726341-1
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.		
Method Blank	Total-HxCDD	[U]	L1726341-1
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.		
Method Blank	Total-PeCDD	[U]	L1726341-1
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.		
Method Blank	Total-PeCDF	[U]	L1726341-1
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.		
Method Blank	Total-TCDD	[U]	L1726341-1
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.		
Method Blank	Total-TCDF	[U]	L1726341-1
Comments:	There were low levels of selected targets detected in the method blank that were within the reference method control limits. Samples with these targets are flagged if the blank concentration is >10% of the sample concentration.		
Duplicate	1,2,3,4,7,8,9-HpCDF	[U]	L1726341-1
Comments:	Sample and duplicate are outside the RPD criteria for select targets. Sample was extracted four times and results show that the sample is not homogenous		
Duplicate	1,2,3,4,7,8-HxCDD	[U]	L1726341-1
Comments:	Sample and duplicate are outside the RPD criteria for select targets. Sample was extracted four times and results show that the sample is not homogenous		
Duplicate	1,2,3,4,7,8-HxCDF	[U]	L1726341-1
Comments:	Sample and duplicate are outside the RPD criteria for select targets. Sample was extracted four times and results show that the sample is not homogenous		
Duplicate	1,2,3,6,7,8-HxCDF	[U]	L1726341-1
Comments:	Sample and duplicate are outside the RPD criteria for select targets. Sample was extracted four times and results show that the sample is not homogenous		
Duplicate	1,2,3,7,8,9-HxCDF	[U]	L1726341-1
Comments:	Sample and duplicate are outside the RPD criteria for select targets. Sample was extracted four times and results show that the sample is not homogenous		
Duplicate	Total-TCDD	[U]	L1726341-1
Comments:	Sample and duplicate are outside the RPD criteria for select targets. Sample was extracted four times and results show that the sample is not homogenous		

Qualifiers for Individual Parameters Listed:

Qualifier	Description
A	Method Blank exceeds ALS DQO. Refer to narrative comments for further information.
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
G	QC result did not meet ALS DQO. Refer to narrative comments for further information.
J,R	The analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,J	A peak has been manually integrated, and the analyte was detected below the calibrated range but above the EDL.
M,J,R	A peak has been manually integrated, the analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,U	A peak has been manually integrated, and the analyte was not detected above the EDL.
RM-ND	Reference Material recovery was slightly outside ALS DQO. Reported non-detect results for associated samples were unaffected.
SMI	Surrogate recovery could not be measured due to sample matrix interference.
[J]	The analyte was detected below the calibrated range but above the EDL.
[U]	The analyte was not detected above the EDL.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-TOT-ORG-LECO-SK	Soil	Organic Carbon by combustion method	SSSA (1996) p. 973

Reference Information

Total Organic Carbon (C-TOT-ORG-LECO-SK, C-TOT-ORG-SK)

Total C and inorganic C are determined on separate samples. The total C is determined by combustion and thermal conductivity detection, while inorganic C is determined by weight lass after addition of hydrochloric acid. Organic C is calculated by the difference between these two determinations.

Reference for Total C:
Nelson, D.W. and Sommers, L.E. 1996. Total Carbon, organic carbon and organic matter. P. 961-1010 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

Reference for Inorganic C:
Loeppert, R.H. and Suarez, D.L. 1996. Gravimetric Method for Loss of Carbon Dioxide. P. 455-456 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

CL-PASTE-COLOR-VA Soil Chloride in Soil (Paste) by Colourimetry Carter-CSSS / APHA 4500-Cl E (modified)

A soil extract produced by the saturated paste extraction procedure is analyzed for chloride by ferricyanide colourimetry.

DX-1613B-HRMS-BU Soil Dioxins and Furans HR 1613B USEPA 1613B

Samples are extracted by Soxhlet. The extracts are prepared using column chromatography, reduced in volume and analyzed by isotope-dilution GC/HRMS

HG-200.2-CVAF-VA Soil Mercury in Soil by CVAFS EPA 200.2/1631E (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAFS.

MET-200.2-CCMS-VA Soil Metals in Soil by CRC ICPMS EPA 200.2/6020A (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample matrix, for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V.

MET-PASTE-ICP-VA Soil Metals in Soil (Paste) by ICPOES Carter-CSSS / EPA 6010B (modified)

A soil extract produced by the saturated paste extraction procedure is analyzed for Sodium, Calcium, and Magnesium by ICPOES as per "Soil Sampling and Methods of Analysis" by M. Carter.

MOIST-SK Soil Moisture Content ASTM D2216-80

The weighed portion of soil is placed in a 105°C oven overnight. The dried soil is allowed to cooled to room temperature, weighed and the % moisture is calculated.

Reference: ASTM D2216-80

MOISTURE-BU Soil % Moisture ASTM METHOD D2974-00

MOISTURE-VA Soil Moisture content ASTM D2974-00 Method A

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

PAH-SUM-CALC-VA Soil Sum of PAH's CALCULATION

Total PAH represents the sum of all PAH analytes reported for a given sample. Note that regulatory agencies and criteria differ in their definitions of Total PAH in terms of the individual PAH analytes to be included.

PAH-TMB-H/A-MS-VA Soil PAH - Rotary Extraction (Hexane/Acetone) EPA 3570/8270

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3570 & 8270, published by the United States Environmental Protection Agency (EPA). The procedure uses a mechanical shaking technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene. The final extract is analysed by capillary column gas chromatography with mass spectrometric detection (GC/MS). Surrogate recoveries may not be reported in cases where interferences from the sample matrix prevent accurate quantitation. Because the two isomers cannot be readily chromatographically separated, benzo(j)fluoranthene is reported as part of the benzo(b)fluoranthene parameter.

PCB-CSR-SUM-CALC-VA Soil Total PCB (BC CSR) in soil BC Contaminated Sites Regulation

Calculation of Total PCB to meet BC Contaminated Sites Regulation. Total PCB (BC CSR) is the sum of the concentrations of PCB aroclors 1242, 1248, 1254 and 1260. Results below detection limit (DL) are treated as zero. The Total PCB detection limit is equal to the highest of the aroclor detection limits used in the sum.

PCB-ED Soil PCBs EPA 3570/8082-GC-ECD

PCB-SE-ECD-VA Soil PCB by Extraction with GCECD EPA8082, 3630

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3500, 3620, 3630, 3660, 3665 & 8082, published by the United States Environmental Protection Agency (EPA). The procedure involves a solid-liquid extraction of a subsample

Reference Information

of the sediment/soil using a mixture of hexane and acetone. Water is added to the extract and the resulting hexane extract undergoes one or more of the following clean-up procedures (if required): florisil clean-up, silica gel clean-up, sulphur clean-up and/or sulphuric acid clean-up. The final extract is analysed by capillary column gas chromatography with electron capture detection (GC/ECD).

PCB-SUM-CALC-VA	Soil	Total PCBs in soil	CALCULATION

Calculation of Total PCB. Total PCB is the sum of the concentrations of PCB aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, and 1268. Results below detection limit (DL) are treated as zero. The Total PCB detection limit is equal to the highest of the aroclor detection limits used in the sum.

PSA-PIPET-DETAIL-SK	Soil	Particle size - Sieve and Pipette	SSIR-51 METHOD 3.2.1

Particle size distribution is determined by a combination of techniques. Dry sieving is performed for coarse particles, wet sieving for sand particles and the pipette sedimentation method for clay particles.

Reference:

Burt, R. (2009). Soil Survey Field and Laboratory Methods Manual. Soil Survey Investigations Report No. 5. Method 3.2.1.2.2. United States Department of Agriculture Natural Resources Conservation Service.

SAT-PCNT-VA	Soil	Saturation Percentage	Carter-CSSS

Saturation Percentage (SP) is the total volume of water present in a saturated paste (in mL) divided by the dry weight of the sample (in grams), expressed as a percentage, as described in "Soil Sampling and Methods of Analysis" by M. Carter.

WHO1998-FISH-EDL-BU	Soil	WHO1998Toxic Equivalency-Fish ND=EDL	Calculation
WHO1998-FISH-HALF-BU	Soil	WHO1998Toxic Equivalency-Fish ND=1/2EDL	Calculation
WHO1998-FISH-ZERO-BU	Soil	WHO1998Toxic Equivalency-Fish ND=0	Calculation

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA
BU	ALS ENVIRONMENTAL - BURLINGTON, ONTARIO, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

L1726341-COFC

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # N/A

Report To		Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company:	Stantec Consulting Ltd.	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Molly Brewis	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400A-2261 Keating Cross Road	Email 1: molly.brewis@stantec.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saanichton, BC V8M 2A5	Email 2: karen.munro@stantec.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-858-9969 Fax: 250-544-1105	Email 3: stefan.dick@stantec.com	
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information	Analysis Request
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 123220054 task 225.101	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #:	
Lab Work Order # (lab use only)		ALS Contact: Brent Mack	Sampler: MB & PW

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-OD-200.2-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU		Archive			Number of Containers
	PCS10 (0-0.2)	19-Jan-16	11:50	SEDIMENT				X	X	X		X					2
	PCS10 (0.2-0.4)	19-Jan-16	11:57	SEDIMENT				X	X	X		X					2
	PCS10 (0.4-0.6)	19-Jan-16	12:03	SEDIMENT				X	X	X		X					2
	PCS10 (0.6-0.8)	19-Jan-16	12:05	SEDIMENT				X	X	X		X					2
	PCS10 (0.8-1.0)	19-Jan-16	12:10	SEDIMENT				X	X	X		X					2
	PCS10 (1.0-1.2)	19-Jan-16	12:11	SEDIMENT										X			2
	PCS10 (1.2-1.4)	19-Jan-16	12:15	SEDIMENT										X			2
	PCL10 (0-0.5)	19-Jan-16	12:32	SEDIMENT	X	X	X	X	X	X	X						3
	PCL10 (0.5-1.0)	19-Jan-16	12:41	SEDIMENT	X	X	X	X	X	X	X						3
	PCL10 (1.0-1.5)	19-Jan-16	12:47	SEDIMENT	X	X	X	X	X	X	X						3
	PCL10 (1.5-1.86)	19-Jan-16	12:56	SEDIMENT				X	X					X			2
	Split 3 (0-0.5)	19-Jan-16		SEDIMENT	X	X	X	X	X	X	X						3
	Split 3 (0.5-1.0)	19-Jan-16		SEDIMENT	X	X	X	X	X	X	X						3
	Split 3 (1.0-1.5)	19-Jan-16		SEDIMENT	X	X	X	X	X	X	X						3
	Split 3 (1.5-1.86)	19-Jan-16		SEDIMENT				X	X					X			2

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Detailed breakdown of particle size for clay and silt fractions. Dioxins and Furans to be reported with WHO 1998 fish TEQs. Some samples for analysis AND archival. Archived samples to be held for 6 months.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by: Molly Brewis	Date (dd-mmm-yy): 21-Jan-16	Time (hh-mm): 7:00	Received by: Jeim	Date: 22 Jan	Time: 11:55	Temperature: 3,4,3,4 °C	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF

Via MR SPEEDY COURIER

L1726341-COFC

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

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COC # N/A

Report To		Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company:	Stantec Consulting Ltd.	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Molly Brewis	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400A-2261 Keating Cross Road	Email 1: molly.brewis@stantec.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saanichton, BC V8M 2A5	Email 2: karen.munro@stantec.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-858-9969 Fax: 250-544-1105	Email 3: stefan.dick@stantec.com	
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information	
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 123220054 task 225.101	
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #:	
Lab Work Order # (lab use only)		ALS Contact: Brent Mack	Sampler: MB & PW

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-OD-200.2-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU		Archive			Number of Containers
					Analysis Request: Please indicate below Filtered, Preserved or both (F, P, F/P)												
	PCS21 (0-0.2)	19-Jan-16	14:26	SEDIMENT	X	X	X	X	X	X		X					3
	PCS33 (0-0.2)	19-Jan-16	15:41	SEDIMENT				X	X	X		X					2
	PCL33 (0-0.5)	19-Jan-16	15:46	SEDIMENT	X	X	X	X	X	X	X						3
	PCS19 (0-0.2)	20-Jan-16	10:17	SEDIMENT				X	X	X		X					2
	PCS19 (0.2-0.4)	20-Jan-16	10:23	SEDIMENT				X	X	X		X					2
	PCS19 (0.4-0.65)	20-Jan-16	10:29	SEDIMENT				X	X	X		X					2
	Split 4 (0-0.2)	20-Jan-16		SEDIMENT				X	X	X		X					2
	Split 4 (0.2-0.4)	20-Jan-16		SEDIMENT				X	X	X		X					2
	Split 4 (0.4-0.65)	20-Jan-16		SEDIMENT				X	X	X		X					2
	SS03 (0-0.075)	20-Jan-16	12:31	SEDIMENT	X	X	X	X	X	X	X						3
	SS02 (0-0.075)	20-Jan-16	12:51	SEDIMENT	X	X	X	X	X	X	X						3
	SS01 (0-0.075)	20-Jan-16	13:15	SEDIMENT	X	X	X	X	X	X	X						3
	PCS25 (0-0.2)	20-Jan-16	15:42	SEDIMENT				X	X	X		X					2
	PCS25 (0.2-0.4)	20-Jan-16	15:45	SEDIMENT				X	X	X		X					2
	PCS25 (0.4-0.6)	20-Jan-16	15:49	SEDIMENT				X	X	X		X					2

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Detailed breakdown of particle size for clay and silt fractions. Dioxins and Furans to be reported with WHO 1998 fish TEQs. Some samples for analysis AND archival. Archived samples to be held for 6 months. Limited sample obtained for SS02 (0-0.075) - may be insufficient for salinity paste analysis.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

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Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Molly Brewis	21-Jan-16	7:00	Jan	22 Jan	11:55	3,4,3,4 °C				

L1726341-COFC

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COC # N/A

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	Saanichton, BC V8M 2A5	Email 2: karen.munro@stantec.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-858-9969 Fax: 250-544-1105	Email 3: stefan.dick@stantec.com	
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information	
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 123220054 task 225.101	
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #:	
Lab Work Order # (lab use only)		ALS Contact: Brent Mack	Sampler: MB & PW

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	OD-PAH-VA	MET-OD-200.2-VA	PCB-SE-ECD-VA	PSA-PIPET-DETAIL-SK	MOISTURE-VA	C-TOT-ORG-LECO-SK	SALINITY-4-VA	DX-1613B-HRMS-BU		Archive			Number of Containers
	PCS25 (0.6-0.8)	20-Jan-16	15:53	SEDIMENT				X	X	X		X					2
	PCS25 (0.8-1.0)	20-Jan-16	15:59	SEDIMENT				X	X	X		X					2
	PCS25 (1.0-1.2)	20-Jan-16	16:04	SEDIMENT										X			2
	PCS25 (1.2-1.4)	20-Jan-16	16:08	SEDIMENT										X			2
	PCL25 (0-0.5)	20-Jan-16	16:17	SEDIMENT	X	X	X	X	X	X	X						3
	PCL25 (0.5-1.0)	20-Jan-16	16:30	SEDIMENT	X	X	X	X	X	X	X						3
	PCL25 (1.0-1.5)	20-Jan-16	16:33	SEDIMENT	X	X	X	X	X	X	X						3
	PCL25 (1.5-2.0)	20-Jan-16	16:40	SEDIMENT				X	X					X			2
	PCL25 (2.0-2.5)	20-Jan-16	16:47	SEDIMENT				X	X					X			2
	SPLIT5 (0-0.075)	20-Jan-16		SEDIMENT	X	X	X	X	X	X							2

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Detailed breakdown of particle size for clay and silt fractions. Dioxins and Furans to be reported with WHO 1998 fish TEQs. Some samples for analysis AND archival. Archived samples to be held for 6 months.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by: Molly Brewis	Date (dd-mmm-yy) 21-Jan-16	Time (hh-mm) 7:00	Received by: Jean	Date: 22 Jan	Time: 11:55	Temperature: 3,4,3,4 °C	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF

via MR SPEEDY COURIER

APPENDIX 4.2

Water Quality Data

STANTEC CONSULTING LTD.
ATTN: Molly Brewis
4370 Dominion Street, 5th Floor
Burnaby BC V5G 4L7

Date Received: 18-DEC-14
Report Date: 07-JAN-15 16:49 (MT)
Version: FINAL

Client Phone: 604-436-3014

Certificate of Analysis

Lab Work Order #: L1560366

Project P.O. #: NOT SUBMITTED
Job Reference: 123220054 TASK 225.101
C of C Numbers:
Legal Site Desc:

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1560366-1	L1560366-2	L1560366-3	L1560366-4	L1560366-5
	Description	SEAWATER	SEAWATER	SEAWATER	SEAWATER	SEAWATER
	Sampled Date	16-DEC-14	16-DEC-14	16-DEC-14	16-DEC-14	16-DEC-14
	Sampled Time	13:05	13:05	14:08	14:08	
	Client ID	WQ_SM_EBB_1M	WQ_SM_EBB_2.5 M	WQ_BA_EBB_1M	WQ_BA_EBB_10M	WQ_EBB_DUP
Grouping	**Analyte**					
SEAWATER						
Physical Tests	Conductivity (uS/cm)	39000	41300	41400	44500	40900
	Hardness (as CaCO3) (mg/L)	4500	4920	4840	5360	4830
	pH (pH)	7.94	7.95	7.93	7.96	7.95
	Salinity (psu)	25.0	26.6	26.7	28.9	26.3
	Total Suspended Solids (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	110	112	112	117	107
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	110	112	112	117	107
	Ammonia, Total (as N) (mg/L)	0.0059	0.0072	<0.0050	<0.0050	<0.0050
	Bromide (Br) (mg/L)	51.1	53.8	52.7	58.0	51.6
	Chloride (Cl) (mg/L)	14500	15500	15300	16600	14900
	Fluoride (F) (mg/L)	1.00	1.06	1.03	1.09	0.98
	Nitrate (as N) (mg/L)	0.53	0.79	0.56	<0.50 DLM	0.57
	Nitrite (as N) (mg/L)	<0.10 DLM	<0.10 DLM	<0.10 DLM	<0.10 DLM	<0.10 DLM
	Total Nitrogen (mg/L)	0.27	0.26	0.27	0.28	0.27
	Phosphorus (P)-Total (mg/L)	0.043	0.047	0.046	0.052	0.045
	Sulfate (SO4) (mg/L)	2020	2160	2130	2320	2090
Total Metals	Aluminum (Al)-Total (mg/L)	0.0321	0.0282	0.0221	0.0203	0.0235
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Barium (Ba)-Total (mg/L)	0.0093	0.0087	0.0088	0.0079	0.0088
	Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	3.33	3.88	3.59	4.19	3.71
	Cadmium (Cd)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Calcium (Ca)-Total (mg/L)	291	321	319	346	314
	Cesium (Cs)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Chromium (Cr)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Cobalt (Co)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Copper (Cu)-Total (mg/L)	0.00055	0.00051	0.00096	<0.00050	0.00071
	Gallium (Ga)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Iron (Fe)-Total (mg/L)	0.072	0.049	0.045	0.042	0.045
	Lead (Pb)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Lithium (Li)-Total (mg/L)	0.117	0.131	0.131	0.139	0.125
	Magnesium (Mg)-Total (mg/L)	916	1000	983	1090	982
	Manganese (Mn)-Total (mg/L)	0.00365	0.00300	0.00290	0.00339	0.00305

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1560366-1 SEAWATER 16-DEC-14 13:05 WQ_SM_EBB_1M	L1560366-2 SEAWATER 16-DEC-14 13:05 WQ_SM_EBB_2.5 M	L1560366-3 SEAWATER 16-DEC-14 14:08 WQ_BA_EBB_1M	L1560366-4 SEAWATER 16-DEC-14 14:08 WQ_BA_EBB_10M	L1560366-5 SEAWATER 16-DEC-14 WQ_EBB_DUP
SEAWATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	0.0080	0.0086	0.0085	0.0091	0.0080
	Nickel (Ni)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Phosphorus (P)-Total (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Potassium (K)-Total (mg/L)	274	298	294	325	291
	Rhenium (Re)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Rubidium (Rb)-Total (mg/L)	0.0950	0.108	0.102	0.120	0.104
	Selenium (Se)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicon (Si)-Total (mg/L)	1.10	1.02	1.04	0.97	1.02
	Silver (Ag)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Sodium (Na)-Total (mg/L)	7730	8280	8200	9000	8020
	Strontium (Sr)-Total (mg/L)	5.38	5.84	5.77	6.35	5.60
	Tellurium (Te)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Thallium (Tl)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Thorium (Th)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Tin (Sn)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Titanium (Ti)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Tungsten (W)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Uranium (U)-Total (mg/L)	0.00236	0.00236	0.00234	0.00254	0.00245
	Vanadium (V)-Total (mg/L)	0.00128	0.00145	0.00135	0.00144	0.00132
	Yttrium (Y)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Total (mg/L)	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
	Zirconium (Zr)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Plant Pigments	Chlorophyll a (ug/L)	0.106	0.054	0.053	0.095	0.084

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1560366-6				
	Description	WATER				
	Sampled Date	16-DEC-14				
	Sampled Time					
	Client ID	TRIP_BLANK				
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (uS/cm)	<2.0				
	Hardness (as CaCO3) (mg/L)	<0.50				
	pH (pH)	5.77				
	Salinity (psu)	<1.0				
	Total Suspended Solids (mg/L)	<3.0				
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0				
	Ammonia, Total (as N) (mg/L)	<0.0050				
	Bromide (Br) (mg/L)	<0.050				
	Chloride (Cl) (mg/L)	<0.50				
	Nitrate (as N) (mg/L)	<0.0050				
	Nitrite (as N) (mg/L)	<0.0010				
	Total Nitrogen (mg/L)	<0.050				
	Phosphorus (P)-Total (mg/L)	<0.0020				
	Sulfate (SO4) (mg/L)	<0.30				
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0030				
	Antimony (Sb)-Total (mg/L)	<0.000010				
	Arsenic (As)-Total (mg/L)	<0.000050				
	Barium (Ba)-Total (mg/L)	<0.00010				
	Beryllium (Be)-Total (mg/L)	<0.0000050				
	Bismuth (Bi)-Total (mg/L)	<0.000050				
	Boron (B)-Total (mg/L)	0.0060 RRV				
	Cadmium (Cd)-Total (mg/L)	<0.0000050				
	Calcium (Ca)-Total (mg/L)	<0.050				
	Cesium (Cs)-Total (mg/L)	<0.0000050				
	Chromium (Cr)-Total (mg/L)	<0.00050				
	Cobalt (Co)-Total (mg/L)	<0.000050				
	Copper (Cu)-Total (mg/L)	<0.00050				
	Gallium (Ga)-Total (mg/L)	<0.000050				
	Iron (Fe)-Total (mg/L)	<0.030				
	Lead (Pb)-Total (mg/L)	<0.000050				
	Lithium (Li)-Total (mg/L)	<0.00020				
	Magnesium (Mg)-Total (mg/L)	<0.10				
	Manganese (Mn)-Total (mg/L)	<0.00020				
	Molybdenum (Mo)-Total (mg/L)	<0.000050				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1560366-6				
	Description	WATER				
	Sampled Date	16-DEC-14				
	Sampled Time					
	Client ID	TRIP_BLANK				
Grouping	**Analyte**					
WATER						
Total Metals	Nickel (Ni)-Total (mg/L)	<0.00020				
	Phosphorus (P)-Total (mg/L)	<0.30				
	Potassium (K)-Total (mg/L)	<2.0				
	Rhenium (Re)-Total (mg/L)	<0.0000050				
	Rubidium (Rb)-Total (mg/L)	<0.000020				
	Selenium (Se)-Total (mg/L)	<0.00020				
	Silicon (Si)-Total (mg/L)	<0.050				
	Silver (Ag)-Total (mg/L)	<0.0000050				
	Sodium (Na)-Total (mg/L)	<2.0				
	Strontium (Sr)-Total (mg/L)	<0.000050				
	Tellurium (Te)-Total (mg/L)	<0.000010				
	Thallium (Tl)-Total (mg/L)	<0.0000020				
	Thorium (Th)-Total (mg/L)	<0.0000050				
	Tin (Sn)-Total (mg/L)	<0.00020				
	Titanium (Ti)-Total (mg/L)	<0.00020				
	Tungsten (W)-Total (mg/L)	<0.000010				
	Uranium (U)-Total (mg/L)	<0.0000020				
	Vanadium (V)-Total (mg/L)	<0.000050				
	Yttrium (Y)-Total (mg/L)	<0.0000050				
	Zinc (Zn)-Total (mg/L)	<0.0030				
	Zirconium (Zr)-Total (mg/L)	<0.000050				
Plant Pigments	Chlorophyll a (ug/L)	<0.010				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Nitrite (as N)	DLM	L1560366-1, -2, -3, -4, -5
Duplicate	Bromide (Br)	DLM	L1560366-6
Duplicate	Nitrite (as N)	DLM	L1560366-6
Duplicate	Bromide (Br)	DLM	L1560366-6
Duplicate	Nitrite (as N)	DLM	L1560366-6
Matrix Spike	Total Nitrogen	MS-B	L1560366-6

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-C-SCR-VA	Seawater	Alk. by colour or titration (seawater)	EPA 310.2 OR APHA 2320

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.
OR
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.
OR
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-C-BR-IC-VA	Seawater	Bromide by IC (seawater)	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-C-CL-IC-VA	Seawater	Chloride by IC (seawater)	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-C-F-IC-VA	Seawater	Fluoride by IC (seawater)	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-C-NO2-IC-VA	Seawater	Nitrite in Seawater by IC	EPA 300.0

This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.

ANIONS-C-NO3-IC-VA	Seawater	Nitrate in Seawater by IC	EPA 300.0

This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.

ANIONS-C-SO4-IC-VA	Seawater	Sulfate by IC (seawater)	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

BR-L-IC-N-VA	Water	Bromide in Water by IC (Low Level)	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

CHLOROA-F-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0

This analysis is done using procedures modified from EPA Method 445.0. Chlorophyll-a is determined by a routine acetone extraction followed with analysis by fluorometry using the non-acidification procedure. This method is not subject to interferences from chlorophyll b.

CHLOROA-F-VA	Seawater	Chlorophyll a by Fluorometer (Seawater)	EPA 445.0

This analysis is done using procedures modified from EPA Method 445.0. Chlorophyll-a is determined by a routine acetone extraction followed with analysis by fluorometry using the non-acidification procedure. This method is not subject to interferences from chlorophyll b.

CL-IC-N-VA	Water	Chloride in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Reference Information

EC-C-PCT-VA	Seawater	Conductivity (Automated) (seawater)	APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

F-IC-N-VA	Water	Fluoride in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

F-ISE-VA	Seawater	Fluoride by SIE	BASED ON APHA 4500-F FLUORIDE

This analysis is carried out using procedures adapted from APHA Method 4500-F "Fluoride". Fluoride is determined using an ion selective electrode.

HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HARDNESS-CALC-VA	Seawater	Hardness	APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

MET-T-L-HRMS-VA	Water	Total Metals in Water by HR-ICPMS	EPA 200.8

Trace metals in water are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) modified from US EPA Method 200.8, (Revision 5.5). The procedures may involve preliminary sample treatment by acid digestion modified from APHA Method 3030E.

MET-T-L-HRMS-VA	Seawater	Tot. Metals in Seawater by HR-ICPMS	EPA 200.8

Trace metals in seawater are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) based on US EPA Method 200.8, (Revision 5.5). The procedures may involve preliminary sample treatment by acid digestion based on APHA Method 3030E.

MET-TOT-C-ICP-VA	Seawater	Total Metals in Seawater by ICPOES	PUGET SOUND PROTOCOLS, EPA 6010B

This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by acid digestion or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-ICP-VA	Water	Total Metals in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

N-T-COL-VA	Water	Total Nitrogen in water by Colour	APHA Method 4500-P (J) / NEMI 5735

This analysis is carried out using procedures adapted from APHA Method 4500-P (J) "Persulphate Method for Simultaneous Determination of Total Nitrogen and Total Phosphorus" and National Environmental Methods Index - Nemi method 5735.

N-T-COL-VA	Seawater	Total Nitgrogen in Seawater by Colour	APHA Method 4500-P (J) / NEMI 5735

This analysis is carried out using procedures adapted from APHA Method 4500-P (J) "Persulphate Method for Simultaneous Determination of Total Nitrogen and Total Phosphorus" and National Environmental Methods Index - Nemi method 5735.

NH3-F-VA	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NH3-F-VA	Seawater	Ammonia in Seawater by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-L-IC-N-VA	Water	Nitrite in Water by IC (Low Level)	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-VA	Water	Nitrate in Water by IC (Low Level)	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

P-T-PRES-COL-VA	Water	Total P in Water by Colour	APHA 4500-P Phosphorus

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

Reference Information

P-T-PRES-COL-VA	Seawater	Total P in Seawater by Colour	APHA 4500-P Phosphorus

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PH-C-PCT-VA	Seawater	pH by Meter (Automated) (seawater)	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

It is recommended that this analysis be conducted in the field.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

SALINITY-C-EC-VA	Seawater	Salinity by calc. using EC (seawater)	APHA 2520 B

Salinity is determined by the APHA 2520B Electrical Conductivity Method. Salinity is a unitless parameter that is roughly equivalent to grams per Litre. ALS applies the unit of psu (practical salinity unit) to indicate that salinity values are derived from the Practical Salinity Scale

SALINITY-EC-VA	Water	Salinity by calculation using EC	APHA 2520 B

Salinity is determined by the APHA 2520B Electrical Conductivity Method. Salinity is a unitless parameter that is roughly equivalent to grams per Litre. ALS applies the unit of psu (practical salinity unit) to indicate that salinity values are derived from the Practical Salinity Scale

SO4-IC-N-VA	Water	Sulfate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

TSS-C-VA	Seawater	Total Suspended Solids by Gravimetric	APHA 2540 D. / PSWQA TSS

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a 0.45um membrane filter (Puget Sound Water Quality Authority TSS Method, May 1991), TSS is determined by drying the filter at 104 degrees celsius.

TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # N/A

Page 1 of 1

Report To		Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company:	Stantec Consulting Ltd.	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Molly Brewis	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400A - 2261 Keating Cross Road	Email 1: molly.brewis@stantec.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saanichton, BC V8M 2A5	Email 2: karen.munro@stantec.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-655-6060 Fax: 250-544-1105	Email 3: stefan.dick@stantec.com	
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information	Analysis Request
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 123220054 task 225.101	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #: Q35177	
Lab Work Order # (lab use only)		ALS Contact: Brent Mack	Sampler: MB & VG

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALKALINITY SPECIES	ANIONS-C-ALL-IC	EC-C-PCT	HARDNESS-CALC	MET-T-ICP+HRMF	PH-C-PCT	TSS, SALINITY	N-T-COL	T-PO4	AMMONIA			Number of Containers
									P			P	P	P			
	WQ_SM_EBB_1M	16-Dec-14	13:05	Seawater	X	X	X	X	X	X	X	X	X	X			3
	WQ_SM_EBB_2.5M	16-Dec-14	13:05	Seawater	X	X	X	X	X	X	X	X	X	X			3
	WQ_BA_EBB_1M	16-Dec-14	14:08	Seawater	X	X	X	X	X	X	X	X	X	X			3
	WQ_BA_EBB_10M	16-Dec-14	14:08	Seawater	X	X	X	X	X	X	X	X	X	X			3
	WQ_EBB_DUP	16-Dec-14		Seawater	X	X	X	X	X	X	X	X	X	X			3
	TRIP_BLANK	16-Dec-14		Water	X	X	X	X	X	X	X	X	X	X			3

L1560366-COFC

Short Holding Time

Rush Processing

Special Instructions | water or land use (CCME-Freshwater Aquatic Life/BC CSR - Comm | ... - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Molly Brewis	17-Dec-14	8:00	Wally	Dec 18	12:15	1.8 °C				

Molly Brewis via Mr. Speedy Delivery

GENF 18.01 Front

STANTEC CONSULTING LTD.
ATTN: Molly Brewis
4370 Dominion Street, 5th Floor
Burnaby BC V5G 4L7

Date Received: 18-DEC-14
Report Date: 07-JAN-15 16:37 (MT)
Version: FINAL

Client Phone: 604-436-3014

Certificate of Analysis

Lab Work Order #: L1560407

Project P.O. #: NOT SUBMITTED
Job Reference: 123220054 TASK 225.101
C of C Numbers:
Legal Site Desc:

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1560407-1	L1560407-2	L1560407-3	L1560407-4	L1560407-5
	Description	SEAWATER	SEAWATER	SEAWATER	SEAWATER	SEAWATER
	Sampled Date	17-DEC-14	17-DEC-14	17-DEC-14	17-DEC-14	17-DEC-14
	Sampled Time	09:20	09:20	10:37	10:37	13:35
	Client ID	WQ_BA_FLOOD_1M	WQ_BA_FLOOD_16M	WQ_BB_EBB_1M	WQ_BB_EBB_18M	WQ_PM_EBB_1M
Grouping	**Analyte**					
SEAWATER						
Physical Tests	Conductivity (uS/cm)	42500	45400	41900	46300	42500
	Hardness (as CaCO3) (mg/L)	5090	5590	4980	5490	5010
	pH (pH)	7.88	7.93	7.92	7.95	7.92
	Salinity (psu)	27.5	29.6	27.0	30.2	27.5
	Total Suspended Solids (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	113	119	114	125	117
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	113	119	114	125	117
	Ammonia, Total (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Bromide (Br) (mg/L)	52.1	60.9	55.4	62.0	55.3
	Chloride (Cl) (mg/L)	16000	17300	15900	17800	16000
	Fluoride (F) (mg/L)	1.02 DLA	1.27	1.08	1.21	1.07
		1.02				
	Nitrate (as N) (mg/L)	0.52	0.52	<0.50 DLM	0.68	0.64
	Nitrite (as N) (mg/L)	<0.10 DLM	<0.10 DLM	<0.10 DLM	<0.10 DLM	<0.10 DLM
	Total Nitrogen (mg/L)	0.42	0.42	0.27	0.26	0.28
	Phosphorus (P)-Total (mg/L)	0.046	0.052	0.050	0.051	0.050
	Sulfate (SO4) (mg/L)	2240	2420	2230	2480	2230
Total Metals	Aluminum (Al)-Total (mg/L)	0.0212	0.0177	0.0183	0.0144	0.0164
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Barium (Ba)-Total (mg/L)	0.0082	0.0073	0.0084	0.0071	0.0085
	Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	3.88	4.14	3.84	4.15	3.87
	Cadmium (Cd)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Calcium (Ca)-Total (mg/L)	327	359	326	364	326
	Cesium (Cs)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Chromium (Cr)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	0.00062
	Cobalt (Co)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Copper (Cu)-Total (mg/L)	0.00339	0.00509	0.00138	0.00051	0.00057
	Gallium (Ga)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Iron (Fe)-Total (mg/L)	0.046	0.046	0.033	0.029	0.043
	Lead (Pb)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Lithium (Li)-Total (mg/L)	0.133	0.142	0.134	0.140	0.125
	Magnesium (Mg)-Total (mg/L)	1040	1140	1010	1110	1020

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1560407-6				
	Description	SEAWATER				
	Sampled Date	17-DEC-14				
	Sampled Time	13:35				
	Client ID	WQ_PM_EBB_11M				
Grouping	**Analyte**					
SEAWATER						
Physical Tests	Conductivity (uS/cm)	43800				
	Hardness (as CaCO3) (mg/L)	5240				
	pH (pH)	7.94				
	Salinity (psu)	28.4				
	Total Suspended Solids (mg/L)	<2.0				
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	120				
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Total (as CaCO3) (mg/L)	120				
	Ammonia, Total (as N) (mg/L)	<0.0050				
	Bromide (Br) (mg/L)	58.2				
	Chloride (Cl) (mg/L)	16700				
	Fluoride (F) (mg/L)	1.01				
	Nitrate (as N) (mg/L)	<0.50 DLM				
	Nitrite (as N) (mg/L)	<0.10 DLM				
	Total Nitrogen (mg/L)	0.28				
	Phosphorus (P)-Total (mg/L)	0.052				
	Sulfate (SO4) (mg/L)	2330				
Total Metals	Aluminum (Al)-Total (mg/L)	0.0183				
	Antimony (Sb)-Total (mg/L)	<0.00050				
	Arsenic (As)-Total (mg/L)	<0.0020				
	Barium (Ba)-Total (mg/L)	0.0077				
	Beryllium (Be)-Total (mg/L)	<0.00050				
	Bismuth (Bi)-Total (mg/L)	<0.00050				
	Boron (B)-Total (mg/L)	3.97				
	Cadmium (Cd)-Total (mg/L)	<0.000050				
	Calcium (Ca)-Total (mg/L)	338				
	Cesium (Cs)-Total (mg/L)	<0.00050				
	Chromium (Cr)-Total (mg/L)	<0.00050				
	Cobalt (Co)-Total (mg/L)	<0.000050				
	Copper (Cu)-Total (mg/L)	0.00109				
	Gallium (Ga)-Total (mg/L)	<0.00050				
	Iron (Fe)-Total (mg/L)	0.038				
	Lead (Pb)-Total (mg/L)	<0.00030				
	Lithium (Li)-Total (mg/L)	0.138				
	Magnesium (Mg)-Total (mg/L)	1070				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1560407-1	L1560407-2	L1560407-3	L1560407-4	L1560407-5
	Description	SEAWATER	SEAWATER	SEAWATER	SEAWATER	SEAWATER
	Sampled Date	17-DEC-14	17-DEC-14	17-DEC-14	17-DEC-14	17-DEC-14
	Sampled Time	09:20	09:20	10:37	10:37	13:35
	Client ID	WQ_BA_FLOOD_1M	WQ_BA_FLOOD_16M	WQ_BB_EBB_1M	WQ_BB_EBB_18M	WQ_PM_EBB_1M
Grouping	**Analyte**					
SEAWATER						
Total Metals	Manganese (Mn)-Total (mg/L)	0.00311	0.00308	0.00287	0.00239	0.00371
	Molybdenum (Mo)-Total (mg/L)	0.0082	0.0092	0.0081	0.0093	0.0088
	Nickel (Ni)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Phosphorus (P)-Total (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Potassium (K)-Total (mg/L)	307	342	306	339	305
	Rhenium (Re)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Rubidium (Rb)-Total (mg/L)	0.111	0.122	0.106	0.122	0.109
	Selenium (Se)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicon (Si)-Total (mg/L)	1.00	0.96	0.97	0.89	0.96
	Silver (Ag)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Sodium (Na)-Total (mg/L)	8360	9290	8340	9200	8290
	Strontium (Sr)-Total (mg/L)	5.91	6.55	5.90	6.48	5.88
	Tellurium (Te)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Thallium (Tl)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Thorium (Th)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Tin (Sn)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Titanium (Ti)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Tungsten (W)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Uranium (U)-Total (mg/L)	0.00245	0.00274	0.00229	0.00275	0.00247
	Vanadium (V)-Total (mg/L)	0.00150	0.00155	0.00138	0.00160	0.00137
	Yttrium (Y)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Total (mg/L)	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
	Zirconium (Zr)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Plant Pigments	Chlorophyll a (ug/L)	0.134	0.064	0.061	<0.010	0.123

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1560407-6				
	Description	SEAWATER				
	Sampled Date	17-DEC-14				
	Sampled Time	13:35				
	Client ID	WQ_PM_EBB_11M				
Grouping	**Analyte**					
SEAWATER						
Total Metals	Manganese (Mn)-Total (mg/L)	0.00382				
	Molybdenum (Mo)-Total (mg/L)	0.0087				
	Nickel (Ni)-Total (mg/L)	<0.00050				
	Phosphorus (P)-Total (mg/L)	<1.0				
	Potassium (K)-Total (mg/L)	320				
	Rhenium (Re)-Total (mg/L)	<0.00050				
	Rubidium (Rb)-Total (mg/L)	0.116				
	Selenium (Se)-Total (mg/L)	<0.0020				
	Silicon (Si)-Total (mg/L)	0.96				
	Silver (Ag)-Total (mg/L)	<0.00010				
	Sodium (Na)-Total (mg/L)	8630				
	Strontium (Sr)-Total (mg/L)	6.09				
	Tellurium (Te)-Total (mg/L)	<0.00050				
	Thallium (Tl)-Total (mg/L)	<0.000050				
	Thorium (Th)-Total (mg/L)	<0.00050				
	Tin (Sn)-Total (mg/L)	<0.0010				
	Titanium (Ti)-Total (mg/L)	<0.0050				
	Tungsten (W)-Total (mg/L)	<0.0010				
	Uranium (U)-Total (mg/L)	0.00258				
	Vanadium (V)-Total (mg/L)	0.00145				
	Yttrium (Y)-Total (mg/L)	<0.00050				
	Zinc (Zn)-Total (mg/L)	<0.0030				
	Zirconium (Zr)-Total (mg/L)	<0.00050				
Plant Pigments	Chlorophyll a (ug/L)	<0.010				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Nitrite (as N)	DLM	L1560407-1, -2, -3, -4, -5, -6

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLM	Detection Limit Adjusted due to sample matrix effects.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-C-SCR-VA	Seawater	Alk. by colour or titration (seawater)	EPA 310.2 OR APHA 2320

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.
OR
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-C-BR-IC-VA	Seawater	Bromide by IC (seawater)	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-C-CL-IC-VA	Seawater	Chloride by IC (seawater)	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-C-F-IC-VA	Seawater	Fluoride by IC (seawater)	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-C-NO2-IC-VA	Seawater	Nitrite in Seawater by IC	EPA 300.0

This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.

ANIONS-C-NO3-IC-VA	Seawater	Nitrate in Seawater by IC	EPA 300.0

This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.

ANIONS-C-SO4-IC-VA	Seawater	Sulfate by IC (seawater)	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

CHLOROA-F-VA	Seawater	Chlorophyll a by Fluorometer (Seawater)	EPA 445.0

This analysis is done using procedures modified from EPA Method 445.0. Chlorophyll-a is determined by a routine acetone extraction followed with analysis by fluorometry using the non-acidification procedure. This method is not subject to interferences from chlorophyll b.

EC-C-PCT-VA	Seawater	Conductivity (Automated) (seawater)	APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

F-ISE-VA	Seawater	Fluoride by SIE	BASED ON APHA 4500-F FLUORIDE

This analysis is carried out using procedures adapted from APHA Method 4500-F "Fluoride". Fluoride is determined using an ion selective electrode.

HARDNESS-CALC-VA	Seawater	Hardness	APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

MET-T-L-HRMS-VA	Seawater	Tot. Metals in Seawater by HR-ICPMS	EPA 200.8

Trace metals in seawater are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) based on US EPA Method 200.8, (Revision 5.5). The procedures may involve preliminary sample treatment by acid digestion based on APHA Method 3030E.

MET-TOT-C-ICP-VA	Seawater	Total Metals in Seawater by ICPOES	PUGET SOUND PROTOCOLS, EPA 6010B

This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by acid digestion or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

N-T-COL-VA	Seawater	Total Nitgrogen in Seawater by Colour	APHA Method 4500-P (J) / NEMI 5735

This analysis is carried out using procedures adapted from APHA Method 4500-P (J) "Persulphate Method for Simultaneous Determination of Total Nitrogen and Total Phosphorus" and National Environmental Methods Index - Nemi method 5735.

NH3-F-VA	Seawater	Ammonia in Seawater by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

Reference Information

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

P-T-PRES-COL-VA Seawater Total P in Seawater by Colour APHA 4500-P Phosphorus

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PH-C-PCT-VA Seawater pH by Meter (Automated) (seawater) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

It is recommended that this analysis be conducted in the field.

SALINITY-C-EC-VA Seawater Salinity by calc. using EC (seawater) APHA 2520 B

Salinity is determined by the APHA 2520B Electrical Conductivity Method. Salinity is a unitless parameter that is roughly equivalent to grams per Litre. ALS applies the unit of psu (practical salinity unit) to indicate that salinity values are derived from the Practical Salinity Scale

TSS-C-VA Seawater Total Suspended Solids by Gravimetric APHA 2540 D. / PSWQA TSS

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a 0.45um membrane filter (Puget Sound Water Quality Authority TSS Method, May 1991), TSS is determined by drying the filter at 104 degrees celsius.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

L1560407-COFC

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # N/A

Report To		Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company:	Stantec Consulting Ltd.	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Molly Brewis	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400A - 2261 Keating Cross Road	Email 1: molly.brewis@stantec.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saanichton, BC V8M 2A5	Email 2: karen.munro@stantec.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-655-6060 Fax: 250-544-1105	Email 3: stefan.dick@stantec.com	
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information	Analysis Request
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 123220054 task 225.101	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #: Q35177	
Lab Work Order # (lab use only)		ALS Contact: Brent Mack	Sampler: MB & VG

Sample #	Sample Identification (This description will ap	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALKALINITY SPECIES	ANIONS-C-ALL-IC	EC-C-PCT	HARDNESS-CALC	MET-T-ICP+HRMF	PH-C-PCT	TSS, SALINITY	N-T-COL	T-PO4	AMMONIA	Chlorophyll a		Number of Containers
									P			P	P	P			
	WQ_BA_FLOOD_1M	17-Dec-14	9:20	Seawater	X	X	X	X	X	X	X	X	X	X	X		3
	WQ_BA_FLOOD_16M	17-Dec-14	9:20	Seawater	X	X	X	X	X	X	X	X	X	X	X		3
	WQ_BB_EBB_1M	17-Dec-14	10:37	Seawater	X	X	X	X	X	X	X	X	X	X	X		4
	WQ_BB_EBB_18M	17-Dec-14	10:37	Seawater	X	X	X	X	X	X	X	X	X	X	X		4
	WQ_PM_EBB_1M	17-Dec-14	13:35	Seawater	X	X	X	X	X	X	X	X	X	X	X		4
	WQ_PM_EBB_11M	17-Dec-14	13:35	Seawater	X	X	X	X	X	X	X	X	X	X	X		4

Rush Processing
Short Holding Time

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Chlorophyll a analysis for WQ_BA_FLOOD_1M and WQ_BA_FLOOD_16M from 1 L plastic bottle as per email from Brent Mack. All other samples have an additional 250 mL plastic bottle (no preservative) for chlorophyll a analysis.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Molly Brewis	17-Dec-14	17:00	Paige	Dec-18	15:00	2.5 °C				

Molly Brewis via Mr. Speedy delivery.

STANTEC CONSULTING LTD.
ATTN: Molly Brewis
4370 Dominion Street, 5th Floor
Burnaby BC V5G 4L7

Date Received: 22-DEC-14
Report Date: 07-JAN-15 17:49 (MT)
Version: FINAL

Client Phone: 604-436-3014

Certificate of Analysis

Lab Work Order #: L1561227

Project P.O. #: NOT SUBMITTED
Job Reference: 123220054 TASK 225.101
C of C Numbers:
Legal Site Desc:

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1561227-1	L1561227-2			
	Description	SEAWATER	SEAWATER			
	Sampled Date	18-DEC-14	18-DEC-14			
	Sampled Time	09:07	09:07			
	Client ID	WQ_BB_FLOOD_1M	WQ_BB_FLOOD_19M			
Grouping	**Analyte**					
SEAWATER						
Physical Tests	Conductivity (uS/cm)	43600	44900			
	Hardness (as CaCO3) (mg/L)	5110	5260			
	pH (pH)	7.94	7.92			
	Salinity (psu)	28.6	29.5			
	Total Suspended Solids (mg/L)	<2.0	<2.0			
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	120	122			
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Total (as CaCO3) (mg/L)	120	122			
	Ammonia, Total (as N) (mg/L)	<0.0050	<0.0050			
	Bromide (Br) (mg/L)	57.5	59.5			
	Chloride (Cl) (mg/L)	16800	17300			
	Fluoride (F) (mg/L)	1.12	1.23			
	Nitrate (as N) (mg/L)	0.95	0.79			
	Nitrite (as N) (mg/L)	0.10	<0.10 DLM			
	Total Nitrogen (mg/L)	0.27	0.25			
	Phosphorus (P)-Total (mg/L)	0.047	0.049			
	Sulfate (SO4) (mg/L)	2320	2400			
Total Metals	Aluminum (Al)-Total (mg/L)	0.0190	0.0174			
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050			
	Arsenic (As)-Total (mg/L)	<0.0020	<0.0020			
	Barium (Ba)-Total (mg/L)	0.0082	0.0072			
	Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050			
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050			
	Boron (B)-Total (mg/L)	3.36	3.50			
	Cadmium (Cd)-Total (mg/L)	<0.000050	<0.000050			
	Calcium (Ca)-Total (mg/L)	337	347			
	Cesium (Cs)-Total (mg/L)	<0.00050	<0.00050			
	Chromium (Cr)-Total (mg/L)	<0.00050	<0.00050			
	Cobalt (Co)-Total (mg/L)	<0.000050	<0.000050			
	Copper (Cu)-Total (mg/L)	0.00125	0.00258			
	Gallium (Ga)-Total (mg/L)	<0.00050	<0.00050			
	Iron (Fe)-Total (mg/L)	0.039	0.038			
	Lead (Pb)-Total (mg/L)	<0.00030	<0.00030			
	Lithium (Li)-Total (mg/L)	0.152	0.166			
	Magnesium (Mg)-Total (mg/L)	1040	1070			
	Manganese (Mn)-Total (mg/L)	0.00261	0.00263			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1561227-1	L1561227-2			
	Description	SEAWATER	SEAWATER			
	Sampled Date	18-DEC-14	18-DEC-14			
	Sampled Time	09:07	09:07			
	Client ID	WQ_BB_FLOOD_1M	WQ_BB_FLOOD_19M			
Grouping	**Analyte**					
SEAWATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	0.0083	0.0086			
	Nickel (Ni)-Total (mg/L)	<0.00050	<0.00050			
	Phosphorus (P)-Total (mg/L)	<1.0	<1.0			
	Potassium (K)-Total (mg/L)	314	322			
	Rhenium (Re)-Total (mg/L)	<0.00050	<0.00050			
	Rubidium (Rb)-Total (mg/L)	0.116	0.124			
	Selenium (Se)-Total (mg/L)	<0.0020	<0.0020			
	Silicon (Si)-Total (mg/L)	0.93	1.01			
	Silver (Ag)-Total (mg/L)	<0.00010	<0.00010			
	Sodium (Na)-Total (mg/L)	9020	9250			
	Strontium (Sr)-Total (mg/L)	6.20	6.31			
	Tellurium (Te)-Total (mg/L)	<0.00050	<0.00050			
	Thallium (Tl)-Total (mg/L)	<0.000050	<0.000050			
	Thorium (Th)-Total (mg/L)	<0.00050	<0.00050			
	Tin (Sn)-Total (mg/L)	<0.0010	<0.0010			
	Titanium (Ti)-Total (mg/L)	<0.0050	<0.0050			
	Tungsten (W)-Total (mg/L)	<0.0010	<0.0010			
	Uranium (U)-Total (mg/L)	0.00233	0.00239			
	Vanadium (V)-Total (mg/L)	0.00137	0.00137			
	Yttrium (Y)-Total (mg/L)	<0.00050	<0.00050			
	Zinc (Zn)-Total (mg/L)	<0.0030	<0.0030			
	Zirconium (Zr)-Total (mg/L)	<0.00050	<0.00050			
Plant Pigments	Chlorophyll a (ug/L)	<0.010	<0.010			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-C-SCR-VA	Seawater	Alk. by colour or titration (seawater)	EPA 310.2 OR APHA 2320

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.
OR
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-C-BR-IC-VA	Seawater	Bromide by IC (seawater)	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-C-CL-IC-VA	Seawater	Chloride by IC (seawater)	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-C-NO2-IC-VA	Seawater	Nitrite in Seawater by IC	EPA 300.0

This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.

ANIONS-C-NO3-IC-VA	Seawater	Nitrate in Seawater by IC	EPA 300.0

This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.

ANIONS-C-SO4-IC-VA	Seawater	Sulfate by IC (seawater)	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

CHLOROA-F-VA	Seawater	Chlorophyll a by Fluorometer (Seawater)	EPA 445.0

This analysis is done using procedures modified from EPA Method 445.0. Chlorophyll-a is determined by a routine acetone extraction followed with analysis by fluorometry using the non-acidification procedure. This method is not subject to interferences from chlorophyll b.

EC-C-PCT-VA	Seawater	Conductivity (Automated) (seawater)	APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

F-ISE-VA	Seawater	Fluoride by SIE	BASED ON APHA 4500-F FLUORIDE

This analysis is carried out using procedures adapted from APHA Method 4500-F "Fluoride". Fluoride is determined using an ion selective electrode.

HARDNESS-CALC-VA	Seawater	Hardness	APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

MET-T-L-HRMS-VA	Seawater	Tot. Metals in Seawater by HR-ICPMS	EPA 200.8

Trace metals in seawater are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) based on US EPA Method 200.8, (Revision 5.5). The procedures may involve preliminary sample treatment by acid digestion based on APHA Method 3030E.

MET-TOT-C-ICP-VA	Seawater	Total Metals in Seawater by ICPOES	PUGET SOUND PROTOCOLS, EPA 6010B

This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by acid digestion or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

N-T-COL-VA	Seawater	Total Nitgrogen in Seawater by Colour	APHA Method 4500-P (J) / NEMI 5735

This analysis is carried out using procedures adapted from APHA Method 4500-P (J) "Persulphate Method for Simultaneous Determination of Total Nitrogen and Total Phosphorus" and National Environmental Methods Index - Nemi method 5735.

NH3-F-VA	Seawater	Ammonia in Seawater by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

P-T-PRES-COL-VA	Seawater	Total P in Seawater by Colour	APHA 4500-P Phosphorus

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PH-C-PCT-VA	Seawater	pH by Meter (Automated) (seawater)	APHA 4500-H pH Value

Reference Information

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

It is recommended that this analysis be conducted in the field.

SALINITY-C-EC-VA Seawater Salinity by calc. using EC (seawater) APHA 2520 B

Salinity is determined by the APHA 2520B Electrical Conductivity Method. Salinity is a unitless parameter that is roughly equivalent to grams per Litre. ALS applies the unit of psu (practical salinity unit) to indicate that salinity values are derived from the Practical Salinity Scale

TSS-C-VA Seawater Total Suspended Solids by Gravimetric APHA 2540 D. / PSWQA TSS

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a 0.45um membrane filter (Puget Sound Water Quality Authority TSS Method, May 1991), TSS is determined by drying the filter at 104 degrees celsius.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

L1561227-COFC

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # N/A

Report To		Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company:	Stantec Consulting Ltd.	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Molly Brewis	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400A - 2261 Keating Cross Road	Email 1: molly.brewis@stantec.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saanichton, BC V8M 2A5	Email 2: karen.munro@stantec.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-655-6060 Fax: 250-544-1105	Email 3: stefan.dick@stantec.com	
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information	Analysis Request
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 123220054 task 225.101	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #: Q35177	
Lab Work Order # (lab use only)		ALS Contact: Brent Mack	Sampler: MB & VG

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALKALINITY SPECIES	ANIONS-C-ALL-IC	EC-C-PCT	HARDNESS-CALC	MET-T-ICP+HRMF	PH-C-PCT	TSS, SALINITY	N-T-COL	T-PO4	AMMONIA	Chlorophyll a		Number of Containers
									P			P	P	P			
	WQ_BB_FLOOD_1M	18-Dec-14	9:07	Seawater	X	X	X	X	X	X	X	X	X	X	X		4
	WQ_BB_FLOOD_19M	18-Dec-14	9:07	Seawater	X	X	X	X	X	X	X	X	X	X	X		4

Short Holding Time

Rush Processing

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Molly Brewis	18-Dec-14	14:00	YC	18Dec22	11:40	2.1 °C				

Molly Brewis via MR SPEEDY DELIVERY

STANTEC CONSULTING LTD.
ATTN: Molly Brewis
4370 Dominion Street, 5th Floor
Burnaby BC V5G 4L7

Date Received: 20-DEC-14
Report Date: 09-JAN-15 11:29 (MT)
Version: FINAL

Client Phone: 604-436-3014

Certificate of Analysis

Lab Work Order #: L1560973

Project P.O. #: NOT SUBMITTED
Job Reference: 123220054 TASK 225.101
C of C Numbers:
Legal Site Desc:

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1560973-1 SEAWATER 19-DEC-14 08:45 WQ_SM_FLOOD_1M	L1560973-2 SEAWATER 19-DEC-14 08:45 WQ_SM_FLOOD_5M	L1560973-3 SEAWATER 19-DEC-14 09:40 WQ_PM_FLOOD_1M	L1560973-4 SEAWATER 19-DEC-14 09:40 WQ_PM_FLOOD_12M	L1560973-5 SEAWATER 19-DEC-14 WQ_FLOOD_DUP
SEAWATER						
Physical Tests	Conductivity (uS/cm)	44100	43900	43700	44800	43700
	Hardness (as CaCO3) (mg/L)	5180	5280	5120	5190	5030
	pH (pH)	7.91	7.93	7.91	7.95	7.93
	Salinity (psu)	28.6	28.5	28.3	29.1	28.3
	Total Suspended Solids (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	124	125	123	123	122
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	124	125	123	123	122
	Ammonia, Total (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Bromide (Br) (mg/L)	56.9	57.5	57.5	58.9	53.8
	Chloride (Cl) (mg/L)	16600	16800	16800	17100	15800
	Fluoride (F) (mg/L)	1.03	1.14	1.12	1.12	1.14
	Nitrate (as N) (mg/L)	0.51	0.50	0.56	0.55	0.59
	Nitrite (as N) (mg/L)	0.12	<0.10 DLM	<0.10 DLM	<0.10 DLM	<0.10 DLM
	Total Nitrogen (mg/L)	<0.25	0.26	0.26	0.26	0.27
	Phosphorus (P)-Total (mg/L)	0.050	0.050	0.050	0.051	0.051
	Sulfate (SO4) (mg/L)	2310	2360	2370	2410	2200
Total Metals	Aluminum (Al)-Total (mg/L)	0.0171	0.0170	0.0186	0.0259	0.0139
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Barium (Ba)-Total (mg/L)	0.0077	0.0077	0.0079	0.0076	0.0079
	Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	3.97	4.13	4.01	3.95	3.76
	Cadmium (Cd)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Calcium (Ca)-Total (mg/L)	336	345	340	341	329
	Cesium (Cs)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Chromium (Cr)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Cobalt (Co)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Copper (Cu)-Total (mg/L)	0.00188	0.00109	0.00089	0.00079	0.00170
	Gallium (Ga)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Iron (Fe)-Total (mg/L)	0.035	0.035	0.033	0.045	0.032
	Lead (Pb)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Lithium (Li)-Total (mg/L)	0.134	0.134	0.136	0.140	0.138
	Magnesium (Mg)-Total (mg/L)	1050	1070	1040	1050	1020
	Manganese (Mn)-Total (mg/L)	0.00267	0.00274	0.00391	0.00368	0.00377

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1560973-1	L1560973-2	L1560973-3	L1560973-4	L1560973-5
	Description	SEAWATER	SEAWATER	SEAWATER	SEAWATER	SEAWATER
	Sampled Date	19-DEC-14	19-DEC-14	19-DEC-14	19-DEC-14	19-DEC-14
	Sampled Time	08:45	08:45	09:40	09:40	
	Client ID	WQ_SM_FLOOD_1M	WQ_SM_FLOOD_5M	WQ_PM_FLOOD_1M	WQ_PM_FLOOD_12M	WQ_FLOOD_DUP
Grouping	**Analyte**					
SEAWATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	0.0089	0.0087	0.0085	0.0089	0.0086
	Nickel (Ni)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Phosphorus (P)-Total (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Potassium (K)-Total (mg/L)	316	322	314	319	305
	Rhenium (Re)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Rubidium (Rb)-Total (mg/L)	0.117	0.119	0.115	0.116	0.110
	Selenium (Se)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicon (Si)-Total (mg/L)	0.95	0.92	0.97	0.88	0.95
	Silver (Ag)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Sodium (Na)-Total (mg/L)	9200	9350	9120	9190	8810
	Strontium (Sr)-Total (mg/L)	6.26	6.37	6.21	6.30	5.98
	Tellurium (Te)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Thallium (Tl)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Thorium (Th)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Tin (Sn)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Titanium (Ti)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Tungsten (W)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Uranium (U)-Total (mg/L)	0.00259	0.00260	0.00247	0.00239	0.00240
	Vanadium (V)-Total (mg/L)	0.00143	0.00143	0.00141	0.00149	0.00140
	Yttrium (Y)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Total (mg/L)	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
	Zirconium (Zr)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Plant Pigments	Chlorophyll a (ug/L)	<0.010	<0.010	<0.010	<0.010	<0.010

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-C-SCR-VA	Seawater	Alk. by colour or titration (seawater)	EPA 310.2 OR APHA 2320

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.
OR
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-C-BR-IC-VA	Seawater	Bromide by IC (seawater)	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-C-CL-IC-VA	Seawater	Chloride by IC (seawater)	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-C-NO2-IC-VA	Seawater	Nitrite in Seawater by IC	EPA 300.0

This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.

ANIONS-C-NO3-IC-VA	Seawater	Nitrate in Seawater by IC	EPA 300.0

This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.

ANIONS-C-SO4-IC-VA	Seawater	Sulfate by IC (seawater)	APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

CHLOROA-F-VA	Seawater	Chlorophyll a by Fluorometer (Seawater)	EPA 445.0

This analysis is done using procedures modified from EPA Method 445.0. Chlorophyll-a is determined by a routine acetone extraction followed with analysis by fluorometry using the non-acidification procedure. This method is not subject to interferences from chlorophyll b.

EC-C-PCT-VA	Seawater	Conductivity (Automated) (seawater)	APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

F-ISE-VA	Seawater	Fluoride by SIE	BASED ON APHA 4500-F FLUORIDE

This analysis is carried out using procedures adapted from APHA Method 4500-F "Fluoride". Fluoride is determined using an ion selective electrode.

HARDNESS-CALC-VA	Seawater	Hardness	APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

MET-T-L-HRMS-VA	Seawater	Tot. Metals in Seawater by HR-ICPMS	EPA 200.8

Trace metals in seawater are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) based on US EPA Method 200.8, (Revision 5.5). The procedures may involve preliminary sample treatment by acid digestion based on APHA Method 3030E.

MET-TOT-C-ICP-VA	Seawater	Total Metals in Seawater by ICPOES	PUGET SOUND PROTOCOLS, EPA 6010B

This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by acid digestion or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

N-T-COL-VA	Seawater	Total Nitgrogen in Seawater by Colour	APHA Method 4500-P (J) / NEMI 5735

This analysis is carried out using procedures adapted from APHA Method 4500-P (J) "Persulphate Method for Simultaneous Determination of Total Nitrogen and Total Phosphorus" and National Environmental Methods Index - Nemi method 5735.

NH3-F-VA	Seawater	Ammonia in Seawater by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

P-T-PRES-COL-VA	Seawater	Total P in Seawater by Colour	APHA 4500-P Phosphorus

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PH-C-PCT-VA	Seawater	pH by Meter (Automated) (seawater)	APHA 4500-H pH Value

Reference Information

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

It is recommended that this analysis be conducted in the field.

SALINITY-C-EC-VA Seawater Salinity by calc. using EC (seawater) APHA 2520 B

Salinity is determined by the APHA 2520B Electrical Conductivity Method. Salinity is a unitless parameter that is roughly equivalent to grams per Litre. ALS applies the unit of psu (practical salinity unit) to indicate that salinity values are derived from the Practical Salinity Scale

TSS-C-VA Seawater Total Suspended Solids by Gravimetric APHA 2540 D. / PSWQA TSS

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a 0.45um membrane filter (Puget Sound Water Quality Authority TSS Method, May 1991), TSS is determined by drying the filter at 104 degrees celsius.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # N/A

Report To		Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company:	Stantec Consulting Ltd.	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Molly Brewis	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	400A - 2261 Keating Cross Road	Email 1: molly.brewis@stantec.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Saanichton, BC V8M 2A5	Email 2: karen.munro@stantec.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	250-655-6060 Fax: 250-544-1105	Email 3: stefan.dick@stantec.com	
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information	Analysis Request
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 123220054 task 225.101	Please Indicate below Filtered, Preserved or both (F, P, F/P)
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #: Q35177	
Lab Work Order # (lab use only)		ALS Contact: Brent Mack	Sampler: MB & VG

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALKALINITY SPECIES	ANIONS-C-ALL-IC	EC-C-PCT	HARDNESS-CALC	MET-T-ICP+HRMF	PH-C-PCT	TSS, SALINITY	N-T-COL	T-PO4	AMMONIA	Chlorophyll a		Number of Containers
									P			P	P	P			
	WQ_SM_FLOOD_1M	19-Dec-14	8:45	Seawater	X	X	X	X	X	X	X	X	X	X	X		4
	WQ_SM_FLOOD_5M	19-Dec-14	8:45	Seawater	X	X	X	X	X	X	X	X	X	X	X		4
	WQ_PM_FLOOD_1M	19-Dec-14	9:40	Seawater	X	X	X	X	X	X	X	X	X	X	X		4
	WQ_PM_FLOOD_12M	19-Dec-14	9:40	Seawater	X	X	X	X	X	X	X	X	X	X	X		4
	WQ_FLOOD_DUP	19-Dec-14		Seawater	X	X	X	X	X	X	X	X	X	X	X		4

Short Holding Time

Rush Processing

L1560973-COFC

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Molly Brewis	19-Dec-14	14:00		Dec20	10:40	23 °C				

Molly Pu via MR SPEEDY DELIVERY

APPENDIX 5

Sediment and Water Quality QA/QC Results

Table 5-1

	Parameter	Unit	DL	BA04 DUP2					BB02 DUP3					PM02 DUP4				
				Sample	DL Sample	Field Dup	DL Dup	RPD	Sample	DL Sample	Field Dup	DL Dup	RPD	Sample	DL Sample	Field Dup	DL Dup	RPD
Metals	Aluminum (Al)	mg/kg	50	22700	-	21100	-	7.31	23300	-	22600	-	3.05	15600		14900		4.59
	Antimony (Sb)	mg/kg	0.10	0.95	-	0.97	-	2.08	0.74	-	0.77	-	3.97	0.81		0.82		1.23
	Arsenic (As)	mg/kg	0.050	10.2	-	9.83	-	3.69	9.47	-	9.36	-	1.17	8.73	-	9.28	-	6.11
	Barium (Ba)	mg/kg	0.50	98.1	-	91.7	-	6.74	102	-	91.6	-	10.74	91.6	-	89.1	-	2.77
	Beryllium (Be)	mg/kg	0.20	0.45	-	0.40	-	11.76	0.48	-	0.41	-	15.73	0.32	-	0.32	-	0.00
	Bismuth (Bi)	mg/kg	0.20	0.22	-	0.21	-	4.65	<0.20	-	<0.20	-	n/a	<0.20	-	<0.20	-	n/a
	Cadmium (Cd)	mg/kg	0.050	0.191	-	0.200	-	4.60	0.164	-	0.161	-	1.85	0.190	-	0.209	-	9.52
	Calcium (Ca)	mg/kg	50	8020	-	9200	-	13.70	13200	-	12300	-	7.06	16300	-	17200	-	5.37
	Chromium (Cr)	mg/kg	0.50	33.4	-	31.5	-	5.86	32.4	-	30.1	-	7.36	25.0	-	25.4	-	1.59
	Cobalt (Co)	mg/kg	0.10	13.1	-	12.4	-	5.49	13.3	-	12.9	-	3.05	9.05	-	8.84	-	2.35
	Copper (Cu)	mg/kg	0.50	46.5	-	44.1	-	5.30	39.5	-	38.2	-	3.35	36.0	-	35.6	-	1.12
	Iron (Fe)	mg/kg	50	38600	-	36900	-	4.50	37800	-	37200	-	1.60	27400	-	27300	-	0.37
	Lead (Pb)	mg/kg	0.50	11.6	-	10.8	-	7.14	10.1	-	10.4	-	2.93	11.2	-	14.9	-	28.35
	Lithium (Li)	mg/kg	5.0	25.1	-	23.7	-	5.74	25.9	-	25.4	-	1.95	18.5	-	18.2	-	1.63
	Magnesium (Mg)	mg/kg	20	12400	-	11600	-	6.67	12100	-	11600	-	4.22	8760	-	8930	-	1.92
	Manganese (Mn)	mg/kg	1.0	529	-	501	-	5.44	541	-	516	-	4.73	356	-	344	-	3.43
	Mercury (Hg)	mg/kg	0.0050	0.0735	-	0.0778	-	5.68	0.0650	-	0.0649	-	0.15	0.0808	-	0.0736	-	9.33
	Molybdenum (Mo)	mg/kg	0.50	2.37	-	2.21	-	6.99	1.22	-	1.40	-	13.74	1.92	-	2.10	-	8.96
	Nickel (Ni)	mg/kg	0.50	29.7	-	28.5	-	4.12	29.2	-	29.2	-	0.00	20.2	-	19.4	-	4.04
	Phosphorus (P)	mg/kg	50	1070	-	1040	-	2.84	1130	-	1100	-	2.69	889	-	959	-	7.58
	Potassium (K)	mg/kg	100	3550	-	3230	-	9.44	3550	-	3300	-	7.30	2990	-	2890	-	3.40
	Selenium (Se)	mg/kg	0.20	0.57	-	0.57	-	0.00	0.51	-	0.51	-	0.00	0.55	-	0.55	-	0.00
	Silver (Ag)	mg/kg	0.10	0.23	-	0.21	-	9.09	0.17	-	0.18	-	5.71	0.17	-	0.17	-	0.00
	Sodium (Na)	mg/kg	100	11400	-	11100	-	2.67	11400	-	10400	-	9.17	9120	-	9900	-	8.20
	Strontium (Sr)	mg/kg	0.50	68.0	-	70.6	-	3.75	80.2	-	75.6	-	5.91	104	-	121	-	15.11
	Thallium (Tl)	mg/kg	0.050	0.110	-	0.110	-	0.00	0.112	-	0.104	-	7.41	0.120	-	0.124	-	3.28
	Tin (Sn)	mg/kg	2.0	<2.0	-	<2.0	-	n/a	<2.0	-	<2.0	-	n/a	<2.0	-	<2.0	-	n/a
	Titanium (Ti)	mg/kg	1.0	946	-	788	-	18.22	984	-	905	-	8.36	733	-	627	-	15.59
	Uranium (U)	mg/kg	0.050	1.45	-	1.42	-	2.09	1.37	-	1.33	-	2.96	1.28	-	1.37	-	6.79
	Vanadium (V)	mg/kg	0.20	85.0	-	80.8	-	5.07	84.8	-	78.7	-	7.46	63.3	-	62.6	-	1.11
	Zinc (Zn)	mg/kg	1.0	106	-	101	-	4.83	102	-	98.9	-	3.09	81.5	-	85.2	-	4.44
Polycyclic Aromatic Hydrocarbons	Acenaphthene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Acenaphthylene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Anthracene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	0.051	-	<0.050	-	n/a
	Benz(a)anthracene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	0.081	-	0.075	-	7.69
	Benzo(a)pyrene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	0.070	-	0.083	-	16.99
	Benzo(b)fluoranthene	mg/kg	0.050	0.064	-	0.052	-	20.69	<0.050	-	<0.050	-	n/a	0.121	-	0.150	-	21.40
	Benzo(g,h,i)perylene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	0.055	-	n/a
	Benzo(k)fluoranthene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Chrysene	mg/kg	0.050	0.052	-	0.080	-	42.42	<0.050	-	<0.050	-	n/a	<0.20	-	<0.20	-	n/a
	Dibenz(a,h)anthracene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Fluoranthene	mg/kg	0.050	0.069	-	0.093	-	29.63	<0.050	-	<0.050	-	n/a	0.162	-	0.181	-	11.08
	Fluorene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	0.059	-	n/a
	2-Methylnaphthalene	mg/kg	0.010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Naphthalene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Phenanthrene	mg/kg	0.050	0.072	-	0.063	-	13.33	<0.050	-	<0.050	-	n/a	0.164	-	0.133	-	20.88
	Pyrene	mg/kg	0.050	0.058	-	0.068	-	15.87	<0.050	-	<0.050	-	n/a	0.160	-	0.159	-	0.63
	Total PAHs	mg/kg	0.20	0.31	-	0.36	-	14.93	<0.20	-	<0.20	-	n/a	0.81	-	0.90	-	10.53
Polychlorinated Biphenyls	PCB-1016	mg/kg	0.020	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a
	PCB-1221	mg/kg	0.020	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a
	PCB-1232	mg/kg	0.020	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a
	PCB-1242	mg/kg	0.020	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a
	PCB-1248	mg/kg	0.020	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a
	PCB-1254	mg/kg	0.020	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a
	PCB-1260	mg/kg	0.020	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a
	PCB-1262	mg/kg	0.020	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a
	PCB-1268	mg/kg	0.020	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a
	Total Polychlorinated Biphenyls	mg/kg	0.020	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a
Dioxins and Furans	2,3,7,8-TCDD	pg/g	SS	0.40	0.15	0.150	0.084	90.91	0.15	0.11	0.250	0.094	50.00	0.364	0.089	0.48	0.12	27.49
	1,2,3,7,8-PeCDD	pg/g	SS	0.656	0.089	<0.076	0.076	n/a	<0.15	0.15	0.840	0.080	n/a	1.27	0.090	1.46	0.13	13.92
	1,2,3,4,7,8-HxCDD	pg/g	SS	0.370	0.043	0.160	0.061	79.25	<0.068	0.068	<0.047	0.047	n/a	<0.27	0.27	<0.31	0.31	n/a
	1,2,3,6,7,8-HxCDD	pg/g	SS	8.97	0.039	8.99	0.056	0.22	6.03	0.065	4.68	0.042	25.21	6.68	0.27	8.32	0.28	21.87
	1,2,3,7,8,9-HxCDD	pg/g	SS	3.70	0.041	2.98	0.058	21.56	1.60	0.066	1.97	0.044	20.73	3.15	0.27	3.60	0.29	13.33
	1,2,3,4,6,7,8-HpCDD	pg/g	SS	20.4	0.57	17.2	0.34	17.02	11.0	0.34	10.8	0.065	1.83	21.7	0.84	30.1	0.84	32.43
	OCDD	pg/g	SS	108	0.41	84.0	0.12	25.00	66.0	0.15	47.6	0.13	32.39	133	0.89	191	0.93	35.80
	Total-TCDD	-	-	<0.15	0.15	<0.084	0.084	n/a	0.41	0.11	<0.094	0.094	n/a	0.885	0.089	1.97	0.12	76.01
	Total TCDD # Homologues	pg/g	-	0	-	0	-	-	1	-	0	-	-	2	-	5	-	-
	Total-PeCDD	-	SS	2.15	0.089	5.27	0.076	84.10	1.45	0.15	1.11	0.080	26.56	4.62	0.090	4.66	0.13	0.86
	Total PeCDD # Homologues	pg/g	-	4	-	5	-	-	2	-	2	-	-	5	-	5	-	-
	Total-HxCDD	-	SS	70.7	0.043	68.8	0.061	2.72	36.1	0.068	33.9	0.047	6.29	51.9	0.27	61.4	0.31	16.77
	Total HxCDD # Homologues	pg/g	-	3	-	6	-	-	2	-	4	-	-	4	-	4	-	-
	Total-HpCDD	-	SS	49.6	0.57	42.8	0.34	14.72	26.5	0.34	23.0	0.065	14.14	57.4	0.84	70.1	0.84	19.92
	Total HpCDD # Homologues	pg/g	-	2	-	2	-	-	2	-	2	-	-	2	-	2	-	-
	2,3,7,8-TCDF	pg/g	SS	16.2	0.022	14.0	0.063	14.57	9.83	0.031	9.81	0.028	0.20	11.0	0.10	13.7	0.15	21.86
	1,2,3,7,8-PeCDF	pg/g	SS	0.34	0.14	0.230	0.023	38.60	0.240	0.065	<0.023	0.023	n/a	0.230	0.074	0.39	0.14	51.61
	2,3,4,7,8-PeCDF	pg/g	SS	0.72	0.11	0.370	0.020	64.22	0.300	0.058	0.210	0.021	35.29	0.430	0.072	0.64	0.11	39.25
	1,2,3,4,7,8-HxCDF	pg/g	SS	0.190	0.025	0.110	0.054	53.33	0.110	0.092	0.070	0.029	44.44	0.340	0.086	0.29	0.16	15.87
	1,2,3,6,7,8-HxCDF	pg/g	SS	<0.025	0.025	0.061	0.052	n/a	0.120	0.082	<0.025	0.025	n/a	0.140	0.085	0.30	0.15	72.73
	1,2,3,7,8,9-HxCDF	pg/g	SS	0.130	0.038	<0.072	0.072	n/a	<0.13	0.13	<0.036	0.036	n/a	<0.13	0.13	<0.23	0.23	n/a
	2,3,4,6,7,8-HxCDF	pg/g	SS	1.96	0.025	0.240	0.055	156.36	0.222	0.088	0.240	0.029	7.79	0.673	0.093	0.66	0.17	1.95
	1,2,3,4,6,7,8-HpCDF	pg/g	SS	4.47	0.039	3.40	0.039	27.19	1.60	0.089	2.10	0.035	27.03	4.86	0.18	5.83	0.29	18.15
	1,2,3,4,7,8,9-HpCDF	pg/g	SS	<0.067	0.067	<0.060	0.060	n/a	<0.14	0.14	<0.054	0.054	n/a	<0.31	0.31	<0.48	0.48	n/a
	OCDF	pg/g	SS	12.6	0.15	7.76	0.10	47.54	6.00	0.15	5.80	0.094	3.39	14.9	0.20	19.0	0.34	24.19
	Total-TCDF	pg/g	SS	26.9	0.022	25.8	0.063	4.17	17.0	0.031	13.5	0.028	22.95	20.0	0.10	26.8	0.15	29.06
	Total TCDF # Homologues	-	-	5	-	7	-	-	6	-	6	-	-	8	-	11	-	-
	Total-PeCDF	pg/g	SS	1.23	0.14	0.140	0.023	159.12	0.396	0.065	0.470	0.023	17.09	3.58	0.074	4.70	0.14	27.05
	Total PeCDF # Homologues	-	-	1	-	1	-	-	2	-	1	-	-	6	-	8	-	-
	Total-HxCDF	pg/g	SS	7.85	0.038	2.34	0.072	108.15	1.84	0.13	<0.036	0.036	n/a	6.92	0.13	8.90	0.23	25.03
	Total HxCDF # Homologues	-	-	4	-	1	-	-	2	-	0	-	-	5	-	5	-	-
	Total-HpCDF	pg/g	SS	13.0	0.067	6.98	0.060	60.26	<0.14	0.14	4.05	0.054	n/a	15.8	0.31	19.5	0.48	20.96
	Total HpCDF # Homologues	pg/g	-	2	-	1	-	-	0	-	1	-	-	2	-	2	-	-
	Lower Bound PCDD/F TEQ (WHO 2005)	pg/g	-	3.65	-	2.77	-	27.41	1.72	-	1.77	-	2.87	4.13	-	5.22	-	23.32
	Mid Point PCDD/F TEQ (WHO 2005)	pg/g	-	4.72	-	3.20	-	38.38	2.27	-	2.98	-	27.05	4.30	-	5.28	-	20.46
	Upper Bound PCDD/F TEQ (WHO 2005)	pg/g	-	4.72	-	3.24	-	37.19	2.36	-	2.99	-	23.55	4.32	-	5.31	-	20.56
	Lower Bound PCDD/F TEQ (WHO 1998)	pg/g	-	1.83	-	0.838	-	74.36	0.585	-	0.573	-	2.07	2.47	-	3.29	-	28.47
	Mid Point PCDD/F TEQ (WHO 1998)	pg/g	-	2.86	-	1.39	-	69.18	1.06	-	1.84	-	53.79	2.78	-	3.41	-	20.36
	Upper Bound PCDD/F TEQ (WHO 1998)	pg/g	-	2.86	-	1.43	-	66.67	1.16	-	1.85	-	45.85	2.86	-	3.5	-	20.13

Notes:

RPD > applicable value* and values > 5xDL

RPD > applicable value* and 1 value < 5x DL, 1 value > 5x DL

*applicable RPD values: high variability metals = 60%, other metals = 45%, PAHs = 75%, PCBs, PCDD/Fs = 60%

SS = sample specific

Table 5-1

	Parameter	Unit	DL	PCS24 (0-0.2) Split 1 (0-0.2)					PCS24 (0.2-0.4) Split 1 (0.2-0.4)					PCS24 (0.4-0.6) Split 1 (0.4-0.6)				
				Sample	DL Sample	Field Dup	DL Dup	RPD	Sample	DL Sample	Field Dup	DL Dup	RPD	Sample	DL Sample	Field Dup	DL Dup	RPD
Metals	Aluminum (Al)	mg/kg	50															
	Antimony (Sb)	mg/kg	0.10															
	Arsenic (As)	mg/kg	0.050															
	Barium (Ba)	mg/kg	0.50															
	Beryllium (Be)	mg/kg	0.20															
	Bismuth (Bi)	mg/kg	0.20															
	Cadmium (Cd)	mg/kg	0.050															
	Calcium (Ca)	mg/kg	50															
	Chromium (Cr)	mg/kg	0.50															
	Cobalt (Co)	mg/kg	0.10															
	Copper (Cu)	mg/kg	0.50															
	Iron (Fe)	mg/kg	50															
	Lead (Pb)	mg/kg	0.50															
	Lithium (Li)	mg/kg	5.0															
	Magnesium (Mg)	mg/kg	20															
	Manganese (Mn)	mg/kg	1.0															
	Mercury (Hg)	mg/kg	0.0050															
	Molybdenum (Mo)	mg/kg	0.50															
	Nickel (Ni)	mg/kg	0.50															
	Phosphorus (P)	mg/kg	50															
	Potassium (K)	mg/kg	100															
	Selenium (Se)	mg/kg	0.20															
	Silver (Ag)	mg/kg	0.10															
	Sodium (Na)	mg/kg	100															
	Strontium (Sr)	mg/kg	0.50															
	Thallium (Tl)	mg/kg	0.050															
	Tin (Sn)	mg/kg	2.0															
	Titanium (Ti)	mg/kg	1.0															
	Uranium (U)	mg/kg	0.050															
	Vanadium (V)	mg/kg	0.20															
	Zinc (Zn)	mg/kg	1.0															
Polycyclic Aromatic Hydrocarbons	Acenaphthene	mg/kg	0.050															
	Acenaphthylene	mg/kg	0.050															
	Anthracene	mg/kg	0.050															
	Benz(a)anthracene	mg/kg	0.050															
	Benzo(a)pyrene	mg/kg	0.050															
	Benzo(b)fluoranthene	mg/kg	0.050															
	Benzo(g,h,i)perylene	mg/kg	0.050															
	Benzo(k)fluoranthene	mg/kg	0.050															
	Chrysene	mg/kg	0.050															
	Dibenz(a,h)anthracene	mg/kg	0.050															
	Fluoranthene	mg/kg	0.050															
	Fluorene	mg/kg	0.050															
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.050															
	2-Methylnaphthalene	mg/kg	0.010															
	Naphthalene	mg/kg	0.050															
	Phenanthrene	mg/kg	0.050															
	Pyrene	mg/kg	0.050															
	Total PAHs	mg/kg	0.20															
Polychlorinated Biphenyls	PCB-1016	mg/kg	0.020															
	PCB-1221	mg/kg	0.020															
	PCB-1232	mg/kg	0.020															
	PCB-1242	mg/kg	0.020															
	PCB-1248	mg/kg	0.020															
	PCB-1254	mg/kg	0.020															
	PCB-1260	mg/kg	0.020															
	PCB-1262	mg/kg	0.020															
	PCB-1268	mg/kg	0.020															
	Total Polychlorinated Biphenyls	mg/kg	0.020															
Dioxins and Furans	2,3,7,8-TCDD	pg/g	SS	<0.18	0.18	0.18	0.17	n/a	<0.14	0.14	<0.15	0.15	n/a	<0.28	0.28	<0.18	0.18	n/a
	1,2,3,7,8-PeCDD	pg/g	SS	0.33	0.23	0.23	0.14	35.71	<0.10	0.1	<0.11	0.11	n/a	<0.20	0.2	<0.12	0.12	n/a
	1,2,3,4,7,8-HxCDD	pg/g	SS	<0.27	0.27	<0.37	0.37	n/a	<0.18	0.18	<0.12	0.12	n/a	<0.29	0.29	<0.12	0.12	n/a
	1,2,3,6,7,8-HxCDD	pg/g	SS	3.58	0.24	2.94	0.35	19.63	<0.16	0.16	<0.12	0.12	n/a	<0.27	0.27	<0.12	0.12	n/a
	1,2,3,7,8,9-HxCDD	pg/g	SS	1	0.26	0.99	0.36	1.01	<0.17	0.17	<0.12	0.12	n/a	<0.28	0.28	<0.12	0.12	n/a
	1,2,3,4,6,7,8-HpCDD	pg/g	SS	9.53	0.27	9.83	0.36	3.10	1.2	0.12	1.75	0.13	37.29	<0.25	0.25	0.13	0.12	n/a
	OCDD	pg/g	SS	49.6	0.44	59.5	0.5	18.15	7.28	0.25	10.2	0.25	33.41	1.09	0.28	1.17	0.16	7.08
	Total-TCDD	-	-	<0.18	0.18	<0.17	0.17	n/a	<0.14	0.14	<0.15	0.15	n/a	<0.28	0.28	<0.18	0.18	n/a
	Total TCDD # Homologues	pg/g	-	0	-	0	-	-	0	-	0	-	-	0	-	0	-	-
	Total-PeCDD	-	SS	<0.23	0.23	0.91	0.14	n/a	<0.10	0.1	<0.11	0.11	n/a	<0.20	0.2	<0.12	0.12	n/a
	Total PeCDD # Homologues	pg/g	-	0	-	3	-	-	0	-	0	-	-	0	-	0	-	-
	Total-HxCDD	-	SS	25.3	0.27	21.8	0.37	14.86	0.26	0.18	<0.12	0.12	n/a	<0.29	0.29	<0.12	0.12	n/a
	Total HxCDD # Homologues	pg/g	-	4	-	4	-	0.00	1	-	0	-	-	0	-	0	-	-
	Total-HpCDD	-	SS	21.1	0.27	20.6	0.36	2.40	1.64	0.12	1.75	0.13	6.49	<0.25	0.25	<0.12	0.12	n/a
	Total HpCDD # Homologues	pg/g	-	2	-	2	-	0.00	1	-	1	-	0.00	0	-	0	-	-
	2,3,7,8-TCDF	pg/g	SS	6.44	0.16	6.65	0.16	3.21	0.19	0.12	<0.12	0.12	n/a	<0.23	0.23	<0.15	0.15	n/a
	1,2,3,7,8-PeCDF	pg/g	SS	<0.12	0.12	0.11	0.092	n/a	<0.10	0.1	<0.084	0.084	n/a	<0.15	0.15	<0.12	0.12	n/a
	2,3,4,7,8-PeCDF	pg/g	SS	0.22	0.1	0.208	0.078	5.61	<0.086	0.086	<0.072	0.072	n/a	<0.13	0.13	<0.11	0.11	n/a
	1,2,3,4,7,8-HxCDF	pg/g	SS	<0.17	0.17	<0.15	0.15	n/a	<0.091	0.091	<0.059	0.059	n/a	<0.13	0.13	<0.069	0.069	n/a
	1,2,3,6,7,8-HxCDF	pg/g	SS	<0.16	0.16	<0.14	0.14	n/a	<0.086	0.086	<0.055	0.055	n/a	<0.11	0.11	<0.064	0.064	n/a
	1,2,3,7,8,9-HxCDF	pg/g	SS	<0.23	0.23	<0.22	0.22	n/a	<0.12	0.12	<0.079	0.079	n/a	<0.18	0.18	<0.096	0.096	n/a
	2,3,4,6,7,8-HxCDF	pg/g	SS	<0.15	0.15	0.17	0.14	n/a	<0.087	0.087	<0.052	0.052	n/a	<0.12	0.12	<0.069	0.069	n/a
	1,2,3,4,6,7,8-HpCDF	pg/g	SS	2.43	0.12	2.49	0.098	2.44	0.38	0.075	0.471	0.064	21.39	<0.13	0.13	<0.067	0.067	n/a
	1,2,3,4,7,8,9-HpCDF	pg/g	SS	<0.18	0.18	<0.13	0.13	n/a	<0.11	0.11	<0.087	0.087	n/a	<0.18	0.18	<0.11	0.11	n/a
	OCDF	pg/g	SS	5.82	0.15	6.06	0.17	4.04	0.97	0.15	1.4	0.12	36.29	0.32	0.25	0.32	0.14	0.00
	Total-TCDF	pg/g	SS	10.7	0.16	11.1	0.16	3.67	0.15	0.12	0.13	0.12	14.29	0.56	0.23	<0.15	0.15	n/a
	Total TCDF # Homologues	-	-	4	-	5	-	22.22	1	-	1	-	0.00	1	-	0	-	-
	Total-PeCDF	pg/g	SS	0.46	0.12	1.62	0.092	111.54	<0.10	0.1	<0.084	0.084	n/a	<0.15	0.15	<0.12	0.12	n/a
	Total PeCDF # Homologues	-	-	2	-	3	-	40.00	0	-	0	-	-	0	-	0	-	-
	Total-HxCDF	pg/g	SS	3.03	0.23	3.33	0.22	9.43	<0.12	0.12	<0.079	0.079	n/a	<0.18	0.18	<0.096	0.096	n/a
	Total HxCDF # Homologues	-	-	3	-	2	-	40.00	0	-	0	-	-	0	-	0	-	-
	Total-HpCDF	pg/g	SS	7.06	0.18	7.21	0.13	2.10	<0.11	0.11	1.38	0.087	n/a	<0.18	0.18	<0.11	0.11	n/a
	Total HpCDF # Homologues	pg/g	-	2	-	2	-	0.00	0	-	2	-	-	0	-	0	-	-
	Lower Bound PCDD/F TEQ (WHO 2005)	pg/g	-	1.2	-	1.49	-	21.56	0.00248	-	0.0253	-	164.29	0.000422	-	0.000351	-	18.37
	Mid Point PCDD/F TEQ (WHO 2005)	pg/g	-	1.77	-	1.73	-	2.29	0.217	-	0.204	-	6.18	0.345	-	0.211	-	48.20
	Upper Bound PCDD/F TEQ (WHO 2005)	pg/g	-	1.92	-	1.78	-	7.57	0.397	-	0.383	-	3.59	0.691	-	0.421	-	48.56
	Lower Bound PCDD/F TEQ (WHO 1998)	pg/g	-	1.238472	-	1.182876	-	4.59	0.436125	-	0.40159	-	8.25	0.7719908	-	0.462749	-	50.09
	Mid Point PCDD/F TEQ (WHO 1998)	pg/g	-	1.041572	-	1.064226	-	2.15	0.225725	-	0.204605	-	9.82	0.3860658	-	0.231514	-	50.05
	Upper Bound PCDD/F TEQ (WHO 1998)	pg/g	-	0.504672	-	0.743076	-	38.21	0.000825	-	0.00748	-	160.26	0.0001408	-	0.000117	-	18.46

Notes:

RPD > applicable value* and values > 5xDL

RPD > applicable value* and 1 value < 5x DL, 1 value > 5x DL

*applicable RPD values: high variability metals = 60%, other metals = 45%, PAHs = 75%, PCBs, PCDD/Fs = 60%

SS = sample specific

Table 5-1

	Parameter	Unit	DL	PCS24 (0.6-0.8) Split 1 (0.6-0.8)					PCS24 (0.8-1.0) Split 1 (0.8-1.0)				
				Sample	DL Sample	Field Dup	DL Dup	RPD	Sample	DL Sample	Field Dup	DL Dup	RPD
Metals	Aluminum (Al)	mg/kg	50										
	Antimony (Sb)	mg/kg	0.10										
	Arsenic (As)	mg/kg	0.050										
	Barium (Ba)	mg/kg	0.50										
	Beryllium (Be)	mg/kg	0.20										
	Bismuth (Bi)	mg/kg	0.20										
	Cadmium (Cd)	mg/kg	0.050										
	Calcium (Ca)	mg/kg	50										
	Chromium (Cr)	mg/kg	0.50										
	Cobalt (Co)	mg/kg	0.10										
	Copper (Cu)	mg/kg	0.50										
	Iron (Fe)	mg/kg	50										
	Lead (Pb)	mg/kg	0.50										
	Lithium (Li)	mg/kg	5.0										
	Magnesium (Mg)	mg/kg	20										
	Manganese (Mn)	mg/kg	1.0										
	Mercury (Hg)	mg/kg	0.0050										
	Molybdenum (Mo)	mg/kg	0.50										
	Nickel (Ni)	mg/kg	0.50										
	Phosphorus (P)	mg/kg	50										
	Potassium (K)	mg/kg	100										
	Selenium (Se)	mg/kg	0.20										
	Silver (Ag)	mg/kg	0.10										
	Sodium (Na)	mg/kg	100										
	Strontium (Sr)	mg/kg	0.50										
	Thallium (Tl)	mg/kg	0.050										
	Tin (Sn)	mg/kg	2.0										
	Titanium (Ti)	mg/kg	1.0										
	Uranium (U)	mg/kg	0.050										
	Vanadium (V)	mg/kg	0.20										
	Zinc (Zn)	mg/kg	1.0										
Polycyclic Aromatic Hydrocarbons	Acenaphthene	mg/kg	0.050										
	Acenaphthylene	mg/kg	0.050										
	Anthracene	mg/kg	0.050										
	Benz(a)anthracene	mg/kg	0.050										
	Benzo(a)pyrene	mg/kg	0.050										
	Benzo(b)fluoranthene	mg/kg	0.050										
	Benzo(g,h,i)perylene	mg/kg	0.050										
	Benzo(k)fluoranthene	mg/kg	0.050										
	Chrysene	mg/kg	0.050										
	Dibenz(a,h)anthracene	mg/kg	0.050										
	Fluoranthene	mg/kg	0.050										
	Fluorene	mg/kg	0.050										
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.050										
	2-Methylnaphthalene	mg/kg	0.010										
	Naphthalene	mg/kg	0.050										
	Phenanthrene	mg/kg	0.050										
	Pyrene	mg/kg	0.050										
	Total PAHs	mg/kg	0.20										
Polychlorinated Biphenyls	PCB-1016	mg/kg	0.020										
	PCB-1221	mg/kg	0.020										
	PCB-1232	mg/kg	0.020										
	PCB-1242	mg/kg	0.020										
	PCB-1248	mg/kg	0.020										
	PCB-1254	mg/kg	0.020										
	PCB-1260	mg/kg	0.020										
	PCB-1262	mg/kg	0.020										
	PCB-1268	mg/kg	0.020										
	Total Polychlorinated Biphenyls	mg/kg	0.020										
Dioxins and Furans	2,3,7,8-TCDD	pg/g	SS	<0.21	0.21	<0.21	0.21	n/a	<0.15	0.15	<0.20	0.2	n/a
	1,2,3,7,8-PeCDD	pg/g	SS	<0.095	0.095	<0.13	0.13	n/a	<0.084	0.084	<0.16	0.16	n/a
	1,2,3,4,7,8-HxCDD	pg/g	SS	<0.17	0.17	<0.18	0.18	n/a	<0.19	0.19	<0.16	0.16	n/a
	1,2,3,6,7,8-HxCDD	pg/g	SS	<0.15	0.15	<0.16	0.16	n/a	<0.17	0.17	<0.15	0.15	n/a
	1,2,3,7,8,9-HxCDD	pg/g	SS	<0.16	0.16	<0.17	0.17	n/a	<0.18	0.18	<0.15	0.15	n/a
	1,2,3,4,6,7,8-HpCDD	pg/g	SS	0.23	0.19	<0.19	0.19	n/a	<0.14	0.14	<0.14	0.14	n/a
	OCDD	pg/g	SS	0.52	0.16	0.44	0.16	16.67	0.24	0.18	<0.22	0.22	n/a
	Total-TCDD	-	-	<0.21	0.21	<0.21	0.21	n/a	<0.15	0.15	<0.20	0.2	n/a
	Total TCDD # Homologues	pg/g	-	0	-	0	-	-	0	-	0	-	-
	Total-PeCDD	-	SS	<0.095	0.095	<0.13	0.13	n/a	<0.084	0.084	<0.16	0.16	n/a
	Total PeCDD # Homologues	pg/g	-	0	-	0	-	-	0	-	0	-	-
	Total-HxCDD	-	SS	<0.17	0.17	<0.18	0.18	n/a	<0.19	0.19	<0.16	0.16	n/a
	Total HxCDD # Homologues	pg/g	-	0	-	0	-	-	0	-	0	-	-
	Total-HpCDD	-	SS	0.23	0.19	<0.19	0.19	n/a	<0.14	0.14	<0.14	0.14	n/a
	Total HpCDD # Homologues	pg/g	-	1	-	0	-	-	0	-	0	-	-
	2,3,7,8-TCDF	pg/g	SS	<0.14	0.14	<0.19	0.19	n/a	<0.12	0.12	<0.17	0.17	n/a
	1,2,3,7,8-PeCDF	pg/g	SS	<0.12	0.12	<0.11	0.11	n/a	<0.085	0.085	<0.096	0.096	n/a
	2,3,4,7,8-PeCDF	pg/g	SS	<0.11	0.11	<0.10	0.1	n/a	<0.078	0.078	<0.086	0.086	n/a
	1,2,3,4,7,8-HxCDF	pg/g	SS	<0.081	0.081	<0.086	0.086	n/a	<0.078	0.078	<0.075	0.075	n/a
	1,2,3,6,7,8-HxCDF	pg/g	SS	<0.080	0.08	<0.077	0.077	n/a	<0.066	0.066	<0.067	0.067	n/a
	1,2,3,7,8,9-HxCDF	pg/g	SS	<0.12	0.12	<0.13	0.13	n/a	<0.11	0.11	<0.10	0.1	n/a
	2,3,4,6,7,8-HxCDF	pg/g	SS	<0.076	0.076	<0.088	0.088	n/a	<0.076	0.076	<0.067	0.067	n/a
	1,2,3,4,6,7,8-HpCDF	pg/g	SS	<0.10	0.1	<0.071	0.071	n/a	<0.068	0.068	<0.087	0.087	n/a
	1,2,3,4,7,8,9-HpCDF	pg/g	SS	<0.17	0.17	<0.12	0.12	n/a	<0.11	0.11	<0.14	0.14	n/a
	OCDF	pg/g	SS	0.33	0.18	<0.22	0.22	n/a	<0.17	0.17	<0.21	0.21	n/a
	Total-TCDF	pg/g	SS	<0.14	0.14	0.41	0.19	n/a	<0.12	0.12	<0.17	0.17	n/a
	Total TCDF # Homologues	-	-	0	-	1	-	-	0	-	0	-	-
	Total-PeCDF	pg/g	SS	<0.12	0.12	<0.11	0.11	n/a	<0.085	0.085	<0.096	0.096	n/a
	Total PeCDF # Homologues	-	-	0	-	0	-	-	0	-	0	-	-
	Total-HxCDF	pg/g	SS	<0.12	0.12	<0.13	0.13	n/a	<0.11	0.11	<0.10	0.1	n/a
	Total HxCDF # Homologues	-	-	0	-	0	-	-	0	-	0	-	-
	Total-HpCDF	pg/g	SS	<0.17	0.17	<0.12	0.12	n/a	<0.11	0.11	<0.14	0.14	n/a
	Total HpCDF # Homologues	pg/g	-	0	-	0	-	-	0	-	0	-	-
	Lower Bound PCDD/F TEQ (WHO 2005)	pg/g	-	0.00225	-	0.000131	-	177.99	0	-	0	-	-
	Mid Point PCDD/F TEQ (WHO 2005)	pg/g	-	0.224	-	0.243	-	8.14	0.181	-	0.243	-	29.25
	Upper Bound PCDD/F TEQ (WHO 2005)	pg/g	-	0.445	-	0.485	-	8.60	0.362	-	0.486	-	29.25
	Lower Bound PCDD/F TEQ (WHO 1998)	pg/g	-	0.49981	-	0.5385656	-	7.46	0.416711	-	0.532653	-	24.43
	Mid Point PCDD/F TEQ (WHO 1998)	pg/g	-	0.25006	-	0.2693046	-	7.41	0.2083675	-	0.2663265	-	24.42
	Upper Bound PCDD/F TEQ (WHO 1998)	pg/g	-	0.000225	-	0.0000436	-	135.07	0	-	0	-	-

Notes:

RPD > applicable value* and values > 5xDL

RPD > applicable value* and 1 value < 5x DL, 1 value > 5x DL

*applicable RPD values: high variability metals = 60%, other metals = 45%, PAHs = 75%, PCBs, PCDD/Fs = 60%

SS = sample specific

Table 5-1

	Parameter	Unit	DL	PCL11 (0-0.5) Split 2 (0-0.5)					PCL11 (0.5-1.0) Split 2 (0.5-1.0)					PCL11 (1.0-1.5) Split 2 (1.0-1.5)				
				Sample	DL Sample	Field Dup	DL Dup	RPD	Sample	DL Sample	Field Dup	DL Dup	RPD	Sample	DL Sample	Field Dup	DL Dup	RPD
Metals	Aluminum (Al)	mg/kg	50															
	Antimony (Sb)	mg/kg	0.10															
	Arsenic (As)	mg/kg	0.050	10.9	-	12.3	-	12.07	10.5	-	10.8	-	2.82	7.5	-	6.98	-	7.18
	Barium (Ba)	mg/kg	0.50															
	Beryllium (Be)	mg/kg	0.20															
	Bismuth (Bi)	mg/kg	0.20															
	Cadmium (Cd)	mg/kg	0.050	0.133	-	0.144	-	7.94	0.154	-	0.149	-	3.30	0.195	-	0.186	-	4.72
	Calcium (Ca)	mg/kg	50															
	Chromium (Cr)	mg/kg	0.50	27.9	-	29.7	-	6.25	23.4	-	23	-	1.72	16.4	-	15.7	-	4.36
	Cobalt (Co)	mg/kg	0.10															
	Copper (Cu)	mg/kg	0.50	34.4	-	36.8	-	6.74	24	-	23.9	-	0.42	13.7	-	12.7	-	7.58
	Iron (Fe)	mg/kg	50															
	Lead (Pb)	mg/kg	0.50	8.85	-	8.89	-	0.45	5.85	-	5.85	-	0.00	3.55	-	3.34	-	6.10
	Lithium (Li)	mg/kg	5.0															
	Magnesium (Mg)	mg/kg	20															
	Manganese (Mn)	mg/kg	1.0															
	Mercury (Hg)	mg/kg	0.0050	0.0556	-	0.0594	-	6.61	0.034	-	0.0334	-	1.78	0.0193	-	0.0185	-	4.23
	Molybdenum (Mo)	mg/kg	0.50															
	Nickel (Ni)	mg/kg	0.50	26.7	-	28.6	-	6.87	21.2	-	21.1	-	0.47	13.9	-	13.1	-	5.93
	Phosphorus (P)	mg/kg	50															
	Potassium (K)	mg/kg	100															
	Selenium (Se)	mg/kg	0.20															
	Silver (Ag)	mg/kg	0.10															
	Sodium (Na)	mg/kg	100															
	Strontium (Sr)	mg/kg	0.50															
	Thallium (Tl)	mg/kg	0.050															
	Tin (Sn)	mg/kg	2.0															
	Titanium (Ti)	mg/kg	1.0															
	Uranium (U)	mg/kg	0.050															
	Vanadium (V)	mg/kg	0.20															
	Zinc (Zn)	mg/kg	1.0	90.6	-	96.4	-	6.20	71.8	-	71.8	-	0.00	45.5	-	43.1	-	5.42
Polycyclic Aromatic Hydrocarbons	Acenaphthene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Acenaphthylene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Anthracene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Benz(a)anthracene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Benzo(a)pyrene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Benzo(b)fluoranthene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Benzo(g,h,i)perylene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Benzo(k)fluoranthene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Chrysene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Dibenz(a,h)anthracene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Fluoranthene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Fluorene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	2-Methylnaphthalene	mg/kg	0.010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Naphthalene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Phenanthrene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Pyrene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Total PAHs	mg/kg	0.20	<0.20	-	<0.20	-	n/a	<0.20	-	<0.20	-	n/a	<0.20	-	<0.20	-	n/a
Polychlorinated Biphenyls	PCB-1016	mg/kg	0.020	<0.010	-	<0.010	-	n/a	<0.010	-	<0.010	-	n/a	<0.010	-	<0.010	-	n/a
	PCB-1221	mg/kg	0.020	<0.010	-	<0.010	-	n/a	<0.010	-	<0.010	-	n/a	<0.010	-	<0.010	-	n/a
	PCB-1232	mg/kg	0.020	<0.010	-	<0.010	-	n/a	<0.010	-	<0.010	-	n/a	<0.010	-	<0.010	-	n/a
	PCB-1242	mg/kg	0.020	<0.010	-	<0.010	-	n/a	<0.010	-	<0.010	-	n/a	<0.010	-	<0.010	-	n/a
	PCB-1248	mg/kg	0.020	<0.010	-	<0.010	-	n/a	<0.010	-	<0.010	-	n/a	<0.010	-	<0.010	-	n/a
	PCB-1254	mg/kg	0.020	<0.010	-	<0.010	-	n/a	<0.010	-	<0.010	-	n/a	<0.010	-	<0.010	-	n/a
	PCB-1260	mg/kg	0.020	<0.010	-	<0.010	-	n/a	<0.010	-	<0.010	-	n/a	<0.010	-	<0.010	-	n/a
	PCB-1262	mg/kg	0.020	<0.010	-	<0.010	-	n/a	<0.010	-	<0.010	-	n/a	<0.010	-	<0.010	-	n/a
	PCB-1268	mg/kg	0.020	<0.010	-	<0.010	-	n/a	<0.010	-	<0.010	-	n/a	<0.010	-	<0.010	-	n/a
	Total Polychlorinated Biphenyls	mg/kg	0.020	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a
Dioxins and Furans	2,3,7,8-TCDD	pg/g	SS															
	1,2,3,7,8-PeCDD	pg/g	SS															
	1,2,3,4,7,8-HxCDD	pg/g	SS															
	1,2,3,6,7,8-HxCDD	pg/g	SS															
	1,2,3,7,8,9-HxCDD	pg/g	SS															
	1,2,3,4,6,7,8-HpCDD	pg/g	SS															
	OCDD	pg/g	SS															
	Total-TCDD	-	-															
	Total TCDD # Homologues	pg/g	-															
	Total-PeCDD	-	SS															
	Total PeCDD # Homologues	pg/g	-															
	Total-HxCDD	-	SS															
	Total HxCDD # Homologues	pg/g	-															
	Total-HpCDD	-	SS															
	Total HpCDD # Homologues	pg/g	-															
	2,3,7,8-TCDF	pg/g	SS															
	1,2,3,7,8-PeCDF	pg/g	SS															
	2,3,4,7,8-PeCDF	pg/g	SS															
	1,2,3,4,7,8-HxCDF	pg/g	SS															
	1,2,3,6,7,8-HxCDF	pg/g	SS															
	1,2,3,7,8,9-HxCDF	pg/g	SS															
	2,3,4,6,7,8-HxCDF	pg/g	SS															
	1,2,3,4,6,7,8-HpCDF	pg/g	SS															
	1,2,3,4,7,8,9-HpCDF	pg/g	SS															
	OCDF	pg/g	SS															
	Total-TCDF	pg/g	SS															
	Total TCDF # Homologues	-	-															
	Total-PeCDF	pg/g	SS															
	Total PeCDF # Homologues	-	-															
	Total-HxCDF	pg/g	SS															
	Total HxCDF # Homologues	-	-															
	Total-HpCDF	pg/g	SS															
	Total HpCDF # Homologues	pg/g	-															
	Lower Bound PCDD/F TEQ (WHO 2005)	pg/g	-															
	Mid Point PCDD/F TEQ (WHO 2005)	pg/g	-															
	Upper Bound PCDD/F TEQ (WHO 2005)	pg/g	-															
	Lower Bound PCDD/F TEQ (WHO 1998)	pg/g	-															
	Mid Point PCDD/F TEQ (WHO 1998)	pg/g	-															
	Upper Bound PCDD/F TEQ (WHO 1998)	pg/g	-															

Notes:

RPD > applicable value* and values > 5xDL

RPD > applicable value* and 1 value < 5x DL, 1 value > 5x DL

*applicable RPD values: high variability metals = 60%, other metals = 45%, PAHs = 75%, PCBs, PCDD/Fs = 60%

SS = sample specific

Table 5-1

	Parameter	Unit	DL	PCL10 (0-0.5)					PCL10 (0.5-1.0)					PCL10 (1.0-1.5)				
				Split 3 (0-0.5)					Split 3 (0.5-1.0)					Split 3 (1.0-1.5)				
				Sample	DL Sample	Field Dup	DL Dup	RPD	Sample	DL Sample	Field Dup	DL Dup	RPD	Sample	DL Sample	Field Dup	DL Dup	RPD
Metals	Aluminum (Al)	mg/kg	50															
	Antimony (Sb)	mg/kg	0.10															
	Arsenic (As)	mg/kg	0.050	7.6	-	7.54	-	0.79	6.22	-	6.59	-	5.78	4.48	-	4.5	-	0.45
	Barium (Ba)	mg/kg	0.50															
	Beryllium (Be)	mg/kg	0.20															
	Bismuth (Bi)	mg/kg	0.20															
	Cadmium (Cd)	mg/kg	0.050	0.137	-	0.155	-	12.33	0.158	-	0.175	-	10.21	0.175	-	0.156	-	11.48
	Calcium (Ca)	mg/kg	50															
	Chromium (Cr)	mg/kg	0.50	18.9	-	18.2	-	3.77	14.8	-	15.3	-	3.32	14.7	-	17.5	-	17.39
	Cobalt (Co)	mg/kg	0.10															
	Copper (Cu)	mg/kg	0.50	17.9	-	17.8	-	0.56	11.4	-	11.5	-	0.87	10.7	-	12.3	-	13.91
	Iron (Fe)	mg/kg	50															
	Lead (Pb)	mg/kg	0.50	5.18	-	5.13	-	0.97	3.35	-	3.33	-	0.60	2.69	-	2.8	-	4.01
	Lithium (Li)	mg/kg	5.0															
	Magnesium (Mg)	mg/kg	20															
	Manganese (Mn)	mg/kg	1.0															
	Mercury (Hg)	mg/kg	0.0050	0.0295	-	0.0296	-	0.34	0.016	-	0.0167	-	4.28	0.0121	-	0.0123	-	1.64
	Molybdenum (Mo)	mg/kg	0.50															
	Nickel (Ni)	mg/kg	0.50	14.5	-	14.9	-	2.72	10.7	-	10.8	-	0.93	10.3	-	11.9	-	14.41
	Phosphorus (P)	mg/kg	50															
	Potassium (K)	mg/kg	100															
	Selenium (Se)	mg/kg	0.20															
	Silver (Ag)	mg/kg	0.10															
	Sodium (Na)	mg/kg	100															
	Strontium (Sr)	mg/kg	0.50															
	Thallium (Tl)	mg/kg	0.050															
	Tin (Sn)	mg/kg	2.0															
	Titanium (Ti)	mg/kg	1.0															
	Uranium (U)	mg/kg	0.050															
	Vanadium (V)	mg/kg	0.20															
	Zinc (Zn)	mg/kg	1.0	55.6	-	54.9	-	1.27	40.2	-	42.1	-	4.62	35.9	-	39.1	-	8.53
Polycyclic Aromatic Hydrocarbons	Acenaphthene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Acenaphthylene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Anthracene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Benz(a)anthracene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Benzo(a)pyrene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Benzo(b)fluoranthene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Benzo(g,h,i)perylene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Benzo(k)fluoranthene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Chrysene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Dibenz(a,h)anthracene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Fluoranthene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Fluorene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	2-Methylnaphthalene	mg/kg	0.010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Naphthalene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Phenanthrene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Pyrene	mg/kg	0.050	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a	<0.050	-	<0.050	-	n/a
	Total PAHs	mg/kg	0.20	<0.20	-	<0.20	-	n/a	<0.20	-	<0.20	-	n/a	<0.20	-	<0.20	-	n/a
Polychlorinated Biphenyls	PCB-1016	mg/kg	0.020	<0.010	-	<0.010	-	n/a	<0.010	-	<0.020	0.020	n/a	<0.010	-	<0.010	-	n/a
	PCB-1221	mg/kg	0.020	<0.010	-	<0.010	-	n/a	<0.010	-	<0.020	0.020	n/a	<0.010	-	<0.010	-	n/a
	PCB-1232	mg/kg	0.020	<0.010	-	<0.010	-	n/a	<0.010	-	<0.020	0.020	n/a	<0.010	-	<0.010	-	n/a
	PCB-1242	mg/kg	0.020	<0.010	-	<0.010	-	n/a	<0.010	-	<0.020	0.020	n/a	<0.010	-	<0.010	-	n/a
	PCB-1248	mg/kg	0.020	<0.010	-	<0.010	-	n/a	<0.010	-	<0.020	0.020	n/a	<0.010	-	<0.010	-	n/a
	PCB-1254	mg/kg	0.020	<0.010	-	<0.010	-	n/a	<0.010	-	<0.020	0.020	n/a	<0.010	-	<0.010	-	n/a
	PCB-1260	mg/kg	0.020	<0.010	-	<0.010	-	n/a	<0.010	-	<0.020	0.020	n/a	<0.010	-	<0.010	-	n/a
	PCB-1262	mg/kg	0.020	<0.010	-	<0.010	-	n/a	<0.010	-	<0.020	0.020	n/a	<0.010	-	<0.010	-	n/a
	PCB-1268	mg/kg	0.020	<0.010	-	<0.010	-	n/a	<0.010	-	<0.020	0.020	n/a	<0.010	-	<0.010	-	n/a
	Total Polychlorinated Biphenyls	mg/kg	0.020	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a	<0.020	-	<0.020	-	n/a
Dioxins and Furans	2,3,7,8-TCDD	pg/g	SS															
	1,2,3,7,8-PeCDD	pg/g	SS															
	1,2,3,4,7,8-HxCDD	pg/g	SS															
	1,2,3,6,7,8-HxCDD	pg/g	SS															
	1,2,3,7,8,9-HxCDD	pg/g	SS															
	1,2,3,4,6,7,8-HpCDD	pg/g	SS															
	OCDD	pg/g	SS															
	Total-TCDD	-	-															
	Total TCDD # Homologues	pg/g	-															
	Total-PeCDD	-	SS															
	Total PeCDD # Homologues	pg/g	-															
	Total-HxCDD	-	SS															
	Total HxCDD # Homologues	pg/g	-															
	Total-HpCDD	-	SS															
	Total HpCDD # Homologues	pg/g	-															
	2,3,7,8-TCDF	pg/g	SS															
	1,2,3,7,8-PeCDF	pg/g	SS															
	2,3,4,7,8-PeCDF	pg/g	SS															
	1,2,3,4,7,8-HxCDF	pg/g	SS															
	1,2,3,6,7,8-HxCDF	pg/g	SS															
	1,2,3,7,8,9-HxCDF	pg/g	SS															
	2,3,4,6,7,8-HxCDF	pg/g	SS															
	1,2,3,4,6,7,8-HpCDF	pg/g	SS															
	1,2,3,4,7,8,9-HpCDF	pg/g	SS															
	OCDF	pg/g	SS															
	Total-TCDF	pg/g	SS															
	Total TCDF # Homologues	-	-															
	Total-PeCDF	pg/g	SS															
	Total PeCDF # Homologues	-	-															
	Total-HxCDF	pg/g	SS															
	Total HxCDF # Homologues	-	-															
	Total-HpCDF	pg/g	SS															
	Total HpCDF # Homologues	pg/g	-															
	Lower Bound PCDD/F TEQ (WHO 2005)	pg/g	-															
	Mid Point PCDD/F TEQ (WHO 2005)	pg/g	-															
	Upper Bound PCDD/F TEQ (WHO 2005)	pg/g	-															
	Lower Bound PCDD/F TEQ (WHO 1998)	pg/g	-															
	Mid Point PCDD/F TEQ (WHO 1998)	pg/g	-															
	Upper Bound PCDD/F TEQ (WHO 1998)	pg/g	-															

Notes:

RPD > applicable value* and values > 5xDL

RPD > applicable value* and 1 value < 5x DL, 1 value > 5x DL

*applicable RPD values: high variability metals = 60%, other metals = 45%, PAHs = 75%, PCBs, PCDD/Fs = 60%

SS = sample specific

Table 5-1

	Parameter	Unit	DL	PCL10 (1.5-1.86) Split 3 (1.5-1.86)					PCS19 (0-0.2) Split 4 (0-0.2)					PCS19 (0.2-0.4) Split 4 (0.2-0.4)				
				Sample	DL Sample	Field Dup	DL Dup	RPD	Sample	DL Sample	Field Dup	DL Dup	RPD	Sample	DL Sample	Field Dup	DL Dup	RPD
Metals	Aluminum (Al)	mg/kg	50															
	Antimony (Sb)	mg/kg	0.10															
	Arsenic (As)	mg/kg	0.050															
	Barium (Ba)	mg/kg	0.50															
	Beryllium (Be)	mg/kg	0.20															
	Bismuth (Bi)	mg/kg	0.20															
	Cadmium (Cd)	mg/kg	0.050															
	Calcium (Ca)	mg/kg	50															
	Chromium (Cr)	mg/kg	0.50															
	Cobalt (Co)	mg/kg	0.10															
	Copper (Cu)	mg/kg	0.50															
	Iron (Fe)	mg/kg	50															
	Lead (Pb)	mg/kg	0.50															
	Lithium (Li)	mg/kg	5.0															
	Magnesium (Mg)	mg/kg	20															
	Manganese (Mn)	mg/kg	1.0															
	Mercury (Hg)	mg/kg	0.0050															
	Molybdenum (Mo)	mg/kg	0.50															
	Nickel (Ni)	mg/kg	0.50															
	Phosphorus (P)	mg/kg	50															
	Potassium (K)	mg/kg	100															
	Selenium (Se)	mg/kg	0.20															
	Silver (Ag)	mg/kg	0.10															
	Sodium (Na)	mg/kg	100															
	Strontium (Sr)	mg/kg	0.50															
	Thallium (Tl)	mg/kg	0.050															
	Tin (Sn)	mg/kg	2.0															
	Titanium (Ti)	mg/kg	1.0															
	Uranium (U)	mg/kg	0.050															
	Vanadium (V)	mg/kg	0.20															
	Zinc (Zn)	mg/kg	1.0															
Polycyclic Aromatic Hydrocarbons	Acenaphthene	mg/kg	0.050															
	Acenaphthylene	mg/kg	0.050															
	Anthracene	mg/kg	0.050															
	Benz(a)anthracene	mg/kg	0.050															
	Benzo(a)pyrene	mg/kg	0.050															
	Benzo(b)fluoranthene	mg/kg	0.050															
	Benzo(g,h,i)perylene	mg/kg	0.050															
	Benzo(k)fluoranthene	mg/kg	0.050															
	Chrysene	mg/kg	0.050															
	Dibenz(a,h)anthracene	mg/kg	0.050															
	Fluoranthene	mg/kg	0.050															
	Fluorene	mg/kg	0.050															
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.050															
	2-Methylnaphthalene	mg/kg	0.010															
	Naphthalene	mg/kg	0.050															
	Phenanthrene	mg/kg	0.050															
	Pyrene	mg/kg	0.050															
	Total PAHs	mg/kg	0.20															
Polychlorinated Biphenyls	PCB-1016	mg/kg	0.020															
	PCB-1221	mg/kg	0.020															
	PCB-1232	mg/kg	0.020															
	PCB-1242	mg/kg	0.020															
	PCB-1248	mg/kg	0.020															
	PCB-1254	mg/kg	0.020															
	PCB-1260	mg/kg	0.020															
	PCB-1262	mg/kg	0.020															
	PCB-1268	mg/kg	0.020															
	Total Polychlorinated Biphenyls	mg/kg	0.020															
Dioxins and Furans	2,3,7,8-TCDD	pg/g	SS						<0.31	0.31	<0.075	0.075	n/a	<0.11	0.11	<0.083	0.083	n/a
	1,2,3,7,8-PeCDD	pg/g	SS						<0.17	0.17	<0.071	0.071	n/a	<0.077	0.077	<0.068	0.068	n/a
	1,2,3,4,7,8-HxCDD	pg/g	SS						<0.20	0.2	<0.12	0.12	n/a	<0.076	0.076	<0.095	0.095	n/a
	1,2,3,6,7,8-HxCDD	pg/g	SS						<0.16	0.16	<0.11	0.11	n/a	<0.066	0.066	<0.089	0.089	n/a
	1,2,3,7,8,9-HxCDD	pg/g	SS						<0.18	0.18	<0.12	0.12	n/a	<0.070	0.07	<0.091	0.091	n/a
	1,2,3,4,6,7,8-HpCDD	pg/g	SS						0.17	0.14	0.19	0.18	11.11	<0.12	0.12	<0.083	0.083	n/a
	OCDD	pg/g	SS						1.98	0.27	0.94	0.12	71.23	0.19	0.1	0.233	0.094	20.33
	Total-TCDD	-	-						<0.31	0.31	<0.075	0.075	n/a	<0.11	0.11	<0.083	0.083	n/a
	Total TCDD # Homologues	pg/g	-						0	-	0	-	-	0	-	0	-	-
	Total-PeCDD	-	SS						<0.17	0.17	<0.071	0.071	n/a	<0.077	0.077	<0.068	0.068	n/a
	Total PeCDD # Homologues	pg/g	-						0	-	0	-	-	0	-	0	-	-
	Total-HxCDD	-	SS						<0.20	0.2	0.36	0.12	n/a	<0.076	0.076	<0.095	0.095	n/a
	Total HxCDD # Homologues	pg/g	-						0	-	2	-	-	0	-	0	-	-
	Total-HpCDD	-	SS						0.27	0.14	0.23	0.18	16.00	<0.12	0.12	<0.083	0.083	n/a
	Total HpCDD # Homologues	pg/g	-						1	-	1	-	-	0	-	0	-	-
	2,3,7,8-TCDF	pg/g	SS						<0.29	0.29	0.2	0.076	n/a	<0.088	0.088	<0.066	0.066	n/a
	1,2,3,7,8-PeCDF	pg/g	SS						<0.17	0.17	<0.050	0.05	n/a	<0.049	0.049	<0.049	0.049	n/a
	2,3,4,7,8-PeCDF	pg/g	SS						<0.17	0.17	<0.050	0.05	n/a	<0.048	0.048	<0.051	0.051	n/a
	1,2,3,4,7,8-HxCDF	pg/g	SS						<0.14	0.14	<0.057	0.057	n/a	<0.050	0.05	<0.035	0.035	n/a
	1,2,3,6,7,8-HxCDF	pg/g	SS						<0.12	0.12	<0.052	0.052	n/a	<0.045	0.045	<0.033	0.033	n/a
	1,2,3,7,8,9-HxCDF	pg/g	SS						<0.22	0.22	<0.078	0.078	n/a	<0.073	0.073	<0.053	0.053	n/a
	2,3,4,6,7,8-HxCDF	pg/g	SS						<0.14	0.14	<0.056	0.056	n/a	<0.054	0.054	<0.037	0.037	n/a
	1,2,3,4,6,7,8-HpCDF	pg/g	SS						<0.21	0.21	<0.055	0.055	n/a	<0.084	0.084	<0.051	0.051	n/a
	1,2,3,4,7,8,9-HpCDF	pg/g	SS						<0.33	0.33	<0.082	0.082	n/a	<0.12	0.12	<0.076	0.076	n/a
	OCDF	pg/g	SS						0.35	0.28	0.13	0.11	91.67	<0.094	0.094	<0.070	0.07	n/a
	Total-TCDF	pg/g	SS						<0.29	0.29	0.147	0.076	n/a	<0.088	0.088	<0.066	0.066	n/a
	Total TCDF # Homologues	-	-						0	-	1	-	-	0	-	0	-	-
	Total-PeCDF	pg/g	SS						<0.17	0.17	<0.050	0.05	n/a	<0.049	0.049	<0.051	0.051	n/a
	Total PeCDF # Homologues	-	-						0	-	0	-	-	0	-	0	-	-
	Total-HxCDF	pg/g	SS						<0.22	0.22	<0.078	0.078	n/a	<0.073	0.073	<0.053	0.053	n/a
	Total HxCDF # Homologues	-	-						0	-	0	-	-	0	-	0	-	-
	Total-HpCDF	pg/g	SS						<0.33	0.33	<0.082	0.082	n/a	<0.12	0.12	<0.076	0.076	n/a
	Total HpCDF # Homologues	pg/g	-						0	-	0	-	-	0	-	0	-	-
	Lower Bound PCDD/F TEQ (WHO 2005)	pg/g	-						0.0007	-	0.000282	-	85.13	0	-	0.0000699	-	200.00
	Mid Point PCDD/F TEQ (WHO 2005)	pg/g	-						0.346	-	0.134	-	88.33	0.129	-	0.11	-	15.90
	Upper Bound PCDD/F TEQ (WHO 2005)	pg/g	-						0.689	-	0.245	-	95.07	0.258	-	0.22	-	15.90
	Lower Bound PCDD/F TEQ (WHO 1998)	pg/g	-						0.0002333	-	0.000094	-	85.12	0	-	0.0000233	-	200.00
	Mid Point PCDD/F TEQ (WHO 1998)	pg/g	-						0.3798033	-	0.141032	-	91.69	0.1408087	-	0.1243783	-	12.39
	Upper Bound PCDD/F TEQ (WHO 1998)	pg/g	-						0.7592033	-	0.271767	-	94.56	0.2815984	-	0.2487333	-	12.39

Notes:

RPD > applicable value* and values > 5xDL

RPD > applicable value* and 1 value < 5x DL, 1 value > 5x DL

*applicable RPD values: high variability metals = 60%, other metals = 45%, PAHs = 75%, PCBs, PCDD/Fs = 60%

SS = sample specific

Table 5-1

	Parameter	Unit	DL	PCS19 (0.4-0.65) Split 4 (0.4-0.65)					SS01 Split 5					PCL30 (0-0.5) Split 6 (0-0.5)				
				Sample	DL Sample	Field Dup	DL Dup	RPD	Sample	DL Sample	Field Dup	DL Dup	RPD	Sample	DL Sample	Field Dup	DL Dup	RPD
Metals	Aluminum (Al)	mg/kg	50															
	Antimony (Sb)	mg/kg	0.10															
	Arsenic (As)	mg/kg	0.050						8.93	-	8.48	-	5.17	9.6	-	9.25	-	3.71
	Barium (Ba)	mg/kg	0.50															
	Beryllium (Be)	mg/kg	0.20															
	Bismuth (Bi)	mg/kg	0.20															
	Cadmium (Cd)	mg/kg	0.050						0.142	-	0.143	-	0.70	0.182	-	0.157	-	14.75
	Calcium (Ca)	mg/kg	50															
	Chromium (Cr)	mg/kg	0.50						23.8	-	24.3	-	2.08	23	-	23.8	-	3.42
	Cobalt (Co)	mg/kg	0.10															
	Copper (Cu)	mg/kg	0.50						28.2	-	30.3	-	7.18	24.8	-	21.8	-	12.88
	Iron (Fe)	mg/kg	50															
	Lead (Pb)	mg/kg	0.50						8.24	-	8.57	-	3.93	7.2	-	5.73	-	22.74
	Lithium (Li)	mg/kg	5.0															
	Magnesium (Mg)	mg/kg	20															
	Manganese (Mn)	mg/kg	1.0															
	Mercury (Hg)	mg/kg	0.0050						0.0462	-	0.05	-	7.90	0.0417	-	0.0394	-	5.67
	Molybdenum (Mo)	mg/kg	0.50															
	Nickel (Ni)	mg/kg	0.50						20.5	-	22	-	7.06	18.6	-	18	-	3.28
	Phosphorus (P)	mg/kg	50															
	Potassium (K)	mg/kg	100															
	Selenium (Se)	mg/kg	0.20															
	Silver (Ag)	mg/kg	0.10															
	Sodium (Na)	mg/kg	100															
	Strontium (Sr)	mg/kg	0.50															
	Thallium (Tl)	mg/kg	0.050															
	Tin (Sn)	mg/kg	2.0															
	Titanium (Ti)	mg/kg	1.0															
	Uranium (U)	mg/kg	0.050															
	Vanadium (V)	mg/kg	0.20															
	Zinc (Zn)	mg/kg	1.0						72.7	-	77.4	-	6.26	71	-	64.4	-	9.75
Polycyclic Aromatic Hydrocarbons	Acenaphthene	mg/kg	0.050						<0.050	-	<0.050	-	n/a	<0.0050	0.0050	<0.0050	0.0050	n/a
	Acenaphthylene	mg/kg	0.050						<0.050	-	<0.050	-	n/a	<0.0050	0.0050	<0.0050	0.0050	n/a
	Anthracene	mg/kg	0.050						<0.050	-	<0.050	-	n/a	0.0058	0.0040	0.005	0.0040	16.22
	Benz(a)anthracene	mg/kg	0.050						<0.050	-	<0.050	-	n/a	0.014	0.010	0.014	0.010	0.00
	Benzo(a)pyrene	mg/kg	0.050						<0.050	-	<0.050	-	n/a	<0.010	0.010	<0.010	0.010	n/a
	Benzo(b)fluoranthene	mg/kg	0.050						<0.050	-	<0.050	-	n/a	0.018	0.010	0.016	0.010	13.64
	Benzo(g,h,i)perylene	mg/kg	0.050						<0.050	-	<0.050	-	n/a	<0.010	0.010	<0.010	0.010	n/a
	Benzo(k)fluoranthene	mg/kg	0.050						<0.050	-	<0.050	-	n/a	<0.010	0.010	<0.010	0.010	n/a
	Chrysene	mg/kg	0.050						<0.050	-	<0.050	-	n/a	0.018	0.010	0.018	0.010	0.00
	Dibenz(a,h)anthracene	mg/kg	0.050						<0.050	-	<0.050	-	n/a	<0.0050	0.0050	<0.0050	0.0050	n/a
	Fluoranthene	mg/kg	0.050						<0.050	-	<0.050	-	n/a	0.023	0.010	0.017	0.010	36.00
	Fluorene	mg/kg	0.050						<0.050	-	<0.050	-	n/a	<0.010	0.010	<0.010	0.010	n/a
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.050						<0.050	-	<0.050	-	n/a	<0.010	0.010	<0.010	0.010	n/a
	2-Methylnaphthalene	mg/kg	0.010						-	-	-	-	-	<0.010	0.010	<0.010	0.010	n/a
	Naphthalene	mg/kg	0.050						<0.050	-	<0.050	-	n/a	<0.010	0.010	<0.010	0.010	n/a
	Phenanthrene	mg/kg	0.050						<0.050	-	<0.050	-	n/a	0.02	0.010	0.013	0.010	48.84
	Pyrene	mg/kg	0.050						<0.050	-	<0.050	-	n/a	0.023	0.010	0.017	0.010	36.00
	Total PAHs	mg/kg	0.20						<0.20	-	<0.20	-	n/a	0.104	0.036	0.083	0.036	28.25
Polychlorinated Biphenyls	PCB-1016	mg/kg	0.020						<0.010	-	<0.010	-	n/a	<0.020	0.020	<0.020	0.020	n/a
	PCB-1221	mg/kg	0.020						<0.010	-	<0.010	-	n/a	<0.020	0.020	<0.020	0.020	n/a
	PCB-1232	mg/kg	0.020						<0.010	-	<0.010	-	n/a	<0.020	0.020	<0.020	0.020	n/a
	PCB-1242	mg/kg	0.020						<0.010	-	<0.010	-	n/a	<0.020	0.020	<0.020	0.020	n/a
	PCB-1248	mg/kg	0.020						<0.010	-	<0.010	-	n/a	<0.020	0.020	<0.020	0.020	n/a
	PCB-1254	mg/kg	0.020						<0.010	-	<0.010	-	n/a	<0.020	0.020	<0.020	0.020	n/a
	PCB-1260	mg/kg	0.020						<0.010	-	<0.010	-	n/a	<0.020	0.020	<0.020	0.020	n/a
	PCB-1262	mg/kg	0.020						<0.010	-	<0.010	-	n/a	<0.020	0.020	<0.020	0.020	n/a
	PCB-1268	mg/kg	0.020						<0.010	-	<0.010	-	n/a	<0.020	0.020	<0.020	0.020	n/a
	Total Polychlorinated Biphenyls	mg/kg	0.020						<0.020	-	<0.020	-	n/a	<0.020	0.020	<0.020	0.020	n/a
Dioxins and Furans	2,3,7,8-TCDD	pg/g	SS	<0.056	0.056	<0.068	0.068	n/a										
	1,2,3,7,8-PeCDD	pg/g	SS	<0.040	0.04	<0.055	0.055	n/a										
	1,2,3,4,7,8-HxCDD	pg/g	SS	<0.063	0.063	<0.074	0.074	n/a										
	1,2,3,6,7,8-HxCDD	pg/g	SS	<0.058	0.058	<0.069	0.069	n/a										
	1,2,3,7,8,9-HxCDD	pg/g	SS	<0.060	0.06	<0.071	0.071	n/a										
	1,2,3,4,6,7,8-HpCDD	pg/g	SS	<0.049	0.049	<0.099	0.099	n/a										
	OCDD	pg/g	SS	0.066	0.038	<0.085	0.085	n/a										
	Total-TCDD	-	-	<0.056	0.056	<0.068	0.068	n/a										
	Total TCDD # Homologues	pg/g	-	0	-	0	-	-										
	Total-PeCDD	-	SS	<0.040	0.04	<0.055	0.055	n/a										
	Total PeCDD # Homologues	pg/g	-	0	-	0	-	-										
	Total-HxCDD	-	SS	<0.063	0.063	<0.074	0.074	n/a										
	Total HxCDD # Homologues	pg/g	-	0	-	0	-	-										
	Total-HpCDD	-	SS	<0.049	0.049	<0.099	0.099	n/a										
	Total HpCDD # Homologues	pg/g	-	0	-	0	-	-										
	2,3,7,8-TCDF	pg/g	SS	<0.052	0.052	<0.075	0.075	n/a										
	1,2,3,7,8-PeCDF	pg/g	SS	<0.042	0.042	<0.045	0.045	n/a										
	2,3,4,7,8-PeCDF	pg/g	SS	<0.039	0.039	<0.045	0.045	n/a										
	1,2,3,4,7,8-HxCDF	pg/g	SS	<0.027	0.027	<0.037	0.037	n/a										
	1,2,3,6,7,8-HxCDF	pg/g	SS	<0.026	0.026	<0.032	0.032	n/a										
	1,2,3,7,8,9-HxCDF	pg/g	SS	<0.038	0.038	<0.056	0.056	n/a										
	2,3,4,6,7,8-HxCDF	pg/g	SS	<0.028	0.028	<0.036	0.036	n/a										
	1,2,3,4,6,7,8-HpCDF	pg/g	SS	<0.048	0.048	<0.041	0.041	n/a										
	1,2,3,4,7,8,9-HpCDF	pg/g	SS	<0.071	0.071	<0.066	0.066	n/a										
	OCDF	pg/g	SS	<0.049	0.049	<0.077	0.077	n/a										
	Total-TCDF	pg/g	SS	0.086	0.052	<0.075	0.075	n/a										
	Total TCDF # Homologues	-	-	1	-	0	-	-										
	Total-PeCDF	pg/g	SS	<0.042	0.042	<0.045	0.045	n/a										
	Total PeCDF # Homologues	-	-	0	-	0	-	-										
	Total-HxCDF	pg/g	SS	<0.038	0.038	<0.056	0.056	n/a										
	Total HxCDF # Homologues	-	-	0	-	0	-	-										
	Total-HpCDF	pg/g	SS	<0.071	0.071	<0.066	0.066	n/a										
	Total HpCDF # Homologues	pg/g	-	0	-	0	-	-										
	Lower Bound PCDD/F TEQ (WHO 2005)	pg/g	-	0	-	0	-	-										
	Mid Point PCDD/F TEQ (WHO 2005)	pg/g	-	0.0729	-	0.0925	-	23.70										
	Upper Bound PCDD/F TEQ (WHO 2005)	pg/g	-	0.146	-	0.185	-	23.56										
	Lower Bound PCDD/F TEQ (WHO 1998)	pg/g	-	0	-	0	-	-										
	Mid Point PCDD/F TEQ (WHO 1998)	pg/g	-	0.08301855	-	0.1035926	-	22.05										
	Upper Bound PCDD/F TEQ (WHO 1998)	pg/g	-	0.1660305	-	0.2071852	-	22.05										

Notes:

RPD > applicable value* and values > 5xDL

RPD > applicable value* and 1 value < 5x DL, 1 value > 5x DL

*applicable RPD values: high variability metals = 60%, other metals = 45%, PAHs = 75%, PCBs, PCDD/Fs = 60%

SS = sample specific

Table 5-1

	Parameter	Unit	DL	PCL30 (0.5-1.0) Split 6 (0.5-1.0)					PCL30 (1.0-1.5) Split 6 (1.0-1.5)					PCS08 (0-0.2) Split 7 (0-0.2)				
				Sample	DL Sample	Field Dup	DL Dup	RPD	Sample	DL Sample	Field Dup	DL Dup	RPD	Sample	DL Sample	Field Dup	DL Dup	RPD
Metals	Aluminum (Al)	mg/kg	50															
	Antimony (Sb)	mg/kg	0.10															
	Arsenic (As)	mg/kg	0.050	9.07	-	12.9	-	34.87	8.16	-	8.12	-	0.49					
	Barium (Ba)	mg/kg	0.50															
	Beryllium (Be)	mg/kg	0.20															
	Bismuth (Bi)	mg/kg	0.20															
	Cadmium (Cd)	mg/kg	0.050	0.218	-	0.156	-	33.16	0.201	-	0.185	-	8.29					
	Calcium (Ca)	mg/kg	50															
	Chromium (Cr)	mg/kg	0.50	21.3	-	23.4	-	9.40	17	-	17.5	-	2.90					
	Cobalt (Co)	mg/kg	0.10															
	Copper (Cu)	mg/kg	0.50	18.5	-	18.9	-	2.14	13.3	-	13.9	-	4.41					
	Iron (Fe)	mg/kg	50															
	Lead (Pb)	mg/kg	0.50	4.83	-	4.78	-	1.04	3.94	-	3.73	-	5.48					
	Lithium (Li)	mg/kg	5.0															
	Magnesium (Mg)	mg/kg	20															
	Manganese (Mn)	mg/kg	1.0															
	Mercury (Hg)	mg/kg	0.0050	0.0255	-	0.0289	-	12.50	0.0206	-	0.0216	-	4.74					
	Molybdenum (Mo)	mg/kg	0.50															
	Nickel (Ni)	mg/kg	0.50	16.9	-	19	-	11.70	13.3	-	13.5	-	1.49					
	Phosphorus (P)	mg/kg	50															
	Potassium (K)	mg/kg	100															
	Selenium (Se)	mg/kg	0.20															
	Silver (Ag)	mg/kg	0.10															
	Sodium (Na)	mg/kg	100															
	Strontium (Sr)	mg/kg	0.50															
	Thallium (Tl)	mg/kg	0.050															
	Tin (Sn)	mg/kg	2.0															
	Titanium (Ti)	mg/kg	1.0															
	Uranium (U)	mg/kg	0.050															
	Vanadium (V)	mg/kg	0.20															
	Zinc (Zn)	mg/kg	1.0	60.3	-	60	-	0.50	47.2	-	48.4	-	2.51					
Polycyclic Aromatic Hydrocarbons	Acenaphthene	mg/kg	0.050	<0.0050	0.0050	<0.0050	0.0050	n/a	<0.0050	0.0050	<0.0050	0.0050	n/a					
	Acenaphthylene	mg/kg	0.050	<0.0050	0.0050	<0.0050	0.0050	n/a	<0.0050	0.0050	<0.0050	0.0050	n/a					
	Anthracene	mg/kg	0.050	<0.0040	0.0040	<0.0040	0.0040	n/a	<0.0040	0.0040	<0.0040	0.0040	n/a					
	Benz(a)anthracene	mg/kg	0.050	<0.010	0.010	<0.010	0.010	n/a	<0.010	0.010	<0.010	0.010	n/a					
	Benzo(a)pyrene	mg/kg	0.050	<0.010	0.010	<0.010	0.010	n/a	<0.010	0.010	<0.010	0.010	n/a					
	Benzo(b)fluoranthene	mg/kg	0.050	<0.010	0.010	<0.010	0.010	n/a	<0.010	0.010	<0.010	0.010	n/a					
	Benzo(g,h,i)perylene	mg/kg	0.050	<0.010	0.010	<0.010	0.010	n/a	<0.010	0.010	<0.010	0.010	n/a					
	Benzo(k)fluoranthene	mg/kg	0.050	<0.010	0.010	<0.010	0.010	n/a	<0.010	0.010	<0.010	0.010	n/a					
	Chrysene	mg/kg	0.050	<0.010	0.010	<0.010	0.010	n/a	<0.010	0.010	<0.010	0.010	n/a					
	Dibenz(a,h)anthracene	mg/kg	0.050	<0.0050	0.0050	<0.0050	0.0050	n/a	<0.0050	0.0050	<0.0050	0.0050	n/a					
	Fluoranthene	mg/kg	0.050	<0.010	0.010	<0.010	0.010	n/a	<0.010	0.010	<0.010	0.010	n/a					
	Fluorene	mg/kg	0.050	<0.010	0.010	<0.010	0.010	n/a	<0.010	0.010	<0.010	0.010	n/a					
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.050	<0.010	0.010	<0.010	0.010	n/a	<0.010	0.010	<0.010	0.010	n/a					
	2-Methylnaphthalene	mg/kg	0.010	<0.010	0.010	<0.010	0.010	n/a	<0.010	0.010	<0.010	0.010	n/a					
	Naphthalene	mg/kg	0.050	<0.010	0.010	<0.010	0.010	n/a	<0.010	0.010	0.011	0.010	n/a					
	Phenanthrene	mg/kg	0.050	<0.010	0.010	<0.010	0.010	n/a	<0.010	0.010	<0.010	0.010	n/a					
	Pyrene	mg/kg	0.050	<0.010	0.010	<0.010	0.010	n/a	<0.010	0.010	<0.010	0.010	n/a					
	Total PAHs	mg/kg	0.20	<0.036	0.036	<0.036	0.036	n/a	<0.036	0.036	<0.036	0.036	n/a					
Polychlorinated Biphenyls	PCB-1016	mg/kg	0.020	<0.020	0.020	<0.020	0.020	n/a	<0.020	0.020	<0.020	0.020	n/a					
	PCB-1221	mg/kg	0.020	<0.020	0.020	<0.020	0.020	n/a	<0.020	0.020	<0.020	0.020	n/a					
	PCB-1232	mg/kg	0.020	<0.020	0.020	<0.020	0.020	n/a	<0.020	0.020	<0.020	0.020	n/a					
	PCB-1242	mg/kg	0.020	<0.020	0.020	<0.020	0.020	n/a	<0.020	0.020	<0.020	0.020	n/a					
	PCB-1248	mg/kg	0.020	<0.020	0.020	<0.020	0.020	n/a	<0.020	0.020	<0.020	0.020	n/a					
	PCB-1254	mg/kg	0.020	<0.020	0.020	<0.020	0.020	n/a	<0.020	0.020	<0.020	0.020	n/a					
	PCB-1260	mg/kg	0.020	<0.020	0.020	<0.020	0.020	n/a	<0.020	0.020	<0.020	0.020	n/a					
	PCB-1262	mg/kg	0.020	<0.020	0.020	<0.020	0.020	n/a	<0.020	0.020	<0.020	0.020	n/a					
	PCB-1268	mg/kg	0.020	<0.020	0.020	<0.020	0.020	n/a	<0.020	0.020	<0.020	0.020	n/a					
	Total Polychlorinated Biphenyls	mg/kg	0.020	<0.020	0.020	<0.020	0.020	n/a	<0.020	0.020	<0.020	0.020	n/a					
Dioxins and Furans	2,3,7,8-TCDD	pg/g	SS											0.225	0.053	0.25	0.045	10.53
	1,2,3,7,8-PeCDD	pg/g	SS											0.27	0.031	0.22	0.068	20.41
	1,2,3,4,7,8-HxCDD	pg/g	SS											<0.083	0.083	<0.11	0.11	n/a
	1,2,3,6,7,8-HxCDD	pg/g	SS											3.34	0.082	3.41	0.11	2.07
	1,2,3,7,8,9-HxCDD	pg/g	SS											1.39	0.083	1.46	0.11	4.91
	1,2,3,4,6,7,8-HpCDD	pg/g	SS											8.46	0.095	7.13	0.18	17.06
	OCDD	pg/g	SS											42.4	0.095	36	0.2	16.33
	Total-TCDD	-	-											0.377	0.053	0.277	0.045	30.58
	Total TCDD # Homologues	pg/g	-											2	-	2	-	-
	Total-PeCDD	-	SS											1.11	0.031	1.41	0.068	23.81
	Total PeCDD # Homologues	pg/g	-											3	-	5	-	-
	Total-HxCDD	-	SS											26.3	0.083	26.1	0.11	0.76
	Total HxCDD # Homologues	pg/g	-											9	-	4	-	-
	Total-HpCDD	-	SS											20.9	0.095	16.6	0.18	22.93
	Total HpCDD # Homologues	pg/g	-											2	-	2	-	-
	2,3,7,8-TCDF	pg/g	SS											6.24	0.031	6.69	0.047	6.96
	1,2,3,7,8-PeCDF	pg/g	SS											0.134	0.032	0.085	0.044	44.75
	2,3,4,7,8-PeCDF	pg/g	SS											0.18	0.029	0.16	0.039	11.76
	1,2,3,4,7,8-HxCDF	pg/g	SS											0.091	0.048	<0.059	0.059	n/a
	1,2,3,6,7,8-HxCDF	pg/g	SS											0.058	0.048	<0.055	0.055	n/a
	1,2,3,7,8,9-HxCDF	pg/g	SS											<0.060	0.06	<0.081	0.081	n/a
	2,3,4,6,7,8-HxCDF	pg/g	SS											0.086	0.046	<0.058	0.058	n/a
	1,2,3,4,6,7,8-HpCDF	pg/g	SS											1.6	0.031	1.47	0.063	8.47
	1,2,3,4,7,8,9-HpCDF	pg/g	SS											0.065	0.042	<0.087	0.087	n/a
	OCDF	pg/g	SS											3.86	0.031	3.6	0.069	6.97
	Total-TCDF	pg/g	SS											11.8	0.031	13.7	0.047	14.90
	Total TCDF # Homologues	-	-											11	-	12	-	-
	Total-PeCDF	pg/g	SS											0.611	0.032	0.593	0.044	2.99
	Total PeCDF # Homologues	-	-											5	-	4	-	-
	Total-HxCDF	pg/g	SS											2.5	0.06	2.02	0.081	21.24
	Total HxCDF # Homologues	-	-											5	-	2	-	-
	Total-HpCDF	pg/g	SS											3.19	0.042	4.46	0.087	33.20
	Total HpCDF # Homologues	pg/g	-											1	-	2	-	-
	Lower Bound PCDD/F TEQ (WHO 2005)	pg/g	-											1.44	-	1.25	-	14.13
	Mid Point PCDD/F TEQ (WHO 2005)	pg/g	-											1.8	-	1.8	-	0.00
	Upper Bound PCDD/F TEQ (WHO 2005)	pg/g	-											1.8	-	1.81	-	0.55
	Lower Bound PCDD/F TEQ (WHO 1998)	pg/g	-											0.621756	-	0.40899	-	41.28
	Mid Point PCDD/F TEQ (WHO 1998)	pg/g	-											1.027956	-	1.003825	-	2.38
	Upper Bound PCDD/F TEQ (WHO 1998)	pg/g	-											1.051706	-	1.04441	-	0.70

Notes:

RPD > applicable value* and values > 5xDL

RPD > applicable value* and 1 value < 5x DL, 1 value > 5x DL

*applicable RPD values: high variability metals = 60%, other metals = 45%, PAHs = 75%, PCBs, PCDD/Fs = 60%

SS = sample specific

Table 5-1

	Parameter	Unit	DL	PCS08 (0.2-0.4) Split 7 (0.2-0.4)					PCS08 (0.4-0.6) Split 7 (0.4-0.6)					PCS08 (0.6-0.8) Split 7 (0.6-0.8)				
				Sample	DL Sample	Field Dup	DL Dup	RPD	Sample	DL Sample	Field Dup	DL Dup	RPD	Sample	DL Sample	Field Dup	DL Dup	RPD
Metals	Aluminum (Al)	mg/kg	50															
	Antimony (Sb)	mg/kg	0.10															
	Arsenic (As)	mg/kg	0.050															
	Barium (Ba)	mg/kg	0.50															
	Beryllium (Be)	mg/kg	0.20															
	Bismuth (Bi)	mg/kg	0.20															
	Cadmium (Cd)	mg/kg	0.050															
	Calcium (Ca)	mg/kg	50															
	Chromium (Cr)	mg/kg	0.50															
	Cobalt (Co)	mg/kg	0.10															
	Copper (Cu)	mg/kg	0.50															
	Iron (Fe)	mg/kg	50															
	Lead (Pb)	mg/kg	0.50															
	Lithium (Li)	mg/kg	5.0															
	Magnesium (Mg)	mg/kg	20															
	Manganese (Mn)	mg/kg	1.0															
	Mercury (Hg)	mg/kg	0.0050															
	Molybdenum (Mo)	mg/kg	0.50															
	Nickel (Ni)	mg/kg	0.50															
	Phosphorus (P)	mg/kg	50															
	Potassium (K)	mg/kg	100															
	Selenium (Se)	mg/kg	0.20															
	Silver (Ag)	mg/kg	0.10															
	Sodium (Na)	mg/kg	100															
	Strontium (Sr)	mg/kg	0.50															
	Thallium (Tl)	mg/kg	0.050															
	Tin (Sn)	mg/kg	2.0															
	Titanium (Ti)	mg/kg	1.0															
	Uranium (U)	mg/kg	0.050															
	Vanadium (V)	mg/kg	0.20															
	Zinc (Zn)	mg/kg	1.0															
Polycyclic Aromatic Hydrocarbons	Acenaphthene	mg/kg	0.050															
	Acenaphthylene	mg/kg	0.050															
	Anthracene	mg/kg	0.050															
	Benz(a)anthracene	mg/kg	0.050															
	Benzo(a)pyrene	mg/kg	0.050															
	Benzo(b)fluoranthene	mg/kg	0.050															
	Benzo(g,h,i)perylene	mg/kg	0.050															
	Benzo(k)fluoranthene	mg/kg	0.050															
	Chrysene	mg/kg	0.050															
	Dibenz(a,h)anthracene	mg/kg	0.050															
	Fluoranthene	mg/kg	0.050															
	Fluorene	mg/kg	0.050															
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.050															
	2-Methylnaphthalene	mg/kg	0.010															
	Naphthalene	mg/kg	0.050															
	Phenanthrene	mg/kg	0.050															
	Pyrene	mg/kg	0.050															
	Total PAHs	mg/kg	0.20															
Polychlorinated Biphenyls	PCB-1016	mg/kg	0.020															
	PCB-1221	mg/kg	0.020															
	PCB-1232	mg/kg	0.020															
	PCB-1242	mg/kg	0.020															
	PCB-1248	mg/kg	0.020															
	PCB-1254	mg/kg	0.020															
	PCB-1260	mg/kg	0.020															
	PCB-1262	mg/kg	0.020															
	PCB-1268	mg/kg	0.020															
	Total Polychlorinated Biphenyls	mg/kg	0.020															
Dioxins and Furans	2,3,7,8-TCDD	pg/g	SS	<0.058	0.058	0.05	0.044	n/a	<0.034	0.034	<0.040	0.04	n/a	<0.023	0.023	<0.033	0.033	n/a
	1,2,3,7,8-PeCDD	pg/g	SS	<0.055	0.055	<0.059	0.059	n/a	<0.033	0.033	<0.037	0.037	n/a	<0.021	0.021	<0.041	0.041	n/a
	1,2,3,4,7,8-HxCDD	pg/g	SS	<0.14	0.14	<0.075	0.075	n/a	<0.030	0.03	<0.081	0.081	n/a	<0.041	0.041	<0.064	0.064	n/a
	1,2,3,6,7,8-HxCDD	pg/g	SS	0.4	0.13	0.67	0.073	50.47	0.12	0.03	<0.071	0.071	n/a	<0.040	0.04	<0.061	0.061	n/a
	1,2,3,7,8,9-HxCDD	pg/g	SS	0.3	0.14	0.416	0.073	32.40	<0.030	0.03	<0.075	0.075	n/a	<0.040	0.04	<0.062	0.062	n/a
	1,2,3,4,6,7,8-HpCDD	pg/g	SS	1.78	0.14	2.53	0.14	34.80	0.34	0.029	0.21	0.055	47.27	0.13	0.034	0.082	0.053	45.28
	OCDD	pg/g	SS	11.9	0.079	14	0.14	16.22	1.81	0.038	1.36	0.059	28.39	0.727	0.028	0.49	0.047	38.95
	Total-TCDD	-	-	<0.058	0.058	0.05	0.044	n/a	0.041	0.034	<0.040	0.04	n/a	<0.023	0.023	<0.033	0.033	n/a
	Total TCDD # Homologues	pg/g	-	0	-	1	-	-	1	-	0	-	-	0	-	0	-	-
	Total-PeCDD	-	SS	0.098	0.055	0.272	0.059	94.05	<0.033	0.033	0.074	0.037	n/a	<0.021	0.021	<0.041	0.041	n/a
	Total PeCDD # Homologues	pg/g	-	1	-	2	-	-	0	-	1	-	-	0	-	0	-	-
	Total-HxCDD	-	SS	0.3	0.14	5.99	0.075	180.92	0.819	0.03	<0.081	0.081	n/a	<0.041	0.041	<0.064	0.064	n/a
	Total HxCDD # Homologues	pg/g	-	1	-	5	-	-	3	-	0	-	-	0	-	0	-	-
	Total-HpCDD	-	SS	4.83	0.14	6.56	0.14	30.38	0.685	0.029	0.21	0.055	106.15	<0.034	0.034	0.22	0.053	n/a
	Total HpCDD # Homologues	pg/g	-	2	-	2	-	-	2	-	1	-	-	0	-	2	-	-
	2,3,7,8-TCDF	pg/g	SS	1.29	0.05	2.03	0.047	44.58	0.27	0.042	0.268	0.029	0.74	0.096	0.019	0.047	0.027	68.53
	1,2,3,7,8-PeCDF	pg/g	SS	0.046	0.032	0.037	0.028	21.69	0.018	0.015	0.027	0.024	40.00	<0.012	0.012	<0.019	0.019	n/a
	2,3,4,7,8-PeCDF	pg/g	SS	0.049	0.029	0.047	0.024	4.17	0.015	0.014	<0.022	0.022	n/a	<0.011	0.011	<0.018	0.018	n/a
	1,2,3,4,7,8-HxCDF	pg/g	SS	<0.059	0.059	<0.058	0.058	n/a	<0.026	0.026	<0.034	0.034	n/a	<0.016	0.016	<0.029	0.029	n/a
	1,2,3,6,7,8-HxCDF	pg/g	SS	<0.055	0.055	<0.056	0.056	n/a	<0.025	0.025	<0.034	0.034	n/a	<0.015	0.015	<0.027	0.027	n/a
	1,2,3,7,8,9-HxCDF	pg/g	SS	<0.073	0.073	<0.080	0.08	n/a	<0.032	0.032	<0.048	0.048	n/a	<0.020	0.02	<0.037	0.037	n/a
	2,3,4,6,7,8-HxCDF	pg/g	SS	<0.054	0.054	<0.054	0.054	n/a	<0.024	0.024	<0.033	0.033	n/a	<0.015	0.015	<0.027	0.027	n/a
	1,2,3,4,6,7,8-HpCDF	pg/g	SS	0.578	0.048	0.67	0.043	14.74	0.113	0.015	0.081	0.025	32.99	0.069	0.03	0.062	0.022	10.69
	1,2,3,4,7,8,9-HpCDF	pg/g	SS	<0.060	0.06	<0.059	0.059	n/a	<0.019	0.019	<0.036	0.036	n/a	<0.038	0.038	<0.030	0.03	n/a
	OCDF	pg/g	SS	1.09	0.058	1.27	0.067	15.25	0.224	0.026	0.168	0.039	28.57	0.071	0.022	0.039	0.035	58.18
	Total-TCDF	pg/g	SS	1.38	0.05	4.02	0.047	97.78	0.126	0.042	0.762	0.029	143.24	0.401	0.019	0.226	0.027	55.82
	Total TCDF # Homologues	-	-	2	-	6	-	-	1	-	3	-	-	2	-	1	-	-
	Total-PeCDF	pg/g	SS	<0.032	0.032	0.128	0.028	n/a	<0.015	0.015	<0.024	0.024	n/a	<0.012	0.012	<0.019	0.019	n/a
	Total PeCDF # Homologues	-	-	0	-	1	-	-	0	-	0	-	-	0	-	0	-	-
	Total-HxCDF	pg/g	SS	0.338	0.073	0.557	0.08	48.94	0.124	0.032	<0.048	0.048	n/a	0.026	0.02	<0.037	0.037	n/a
	Total HxCDF # Homologues	-	-	1	-	1	-	-	2	-	0	-	-	1	-	0	-	-
	Total-HpCDF	pg/g	SS	1.4	0.06	1.82	0.059	26.09	0.33	0.019	0.231	0.036	35.29	0.078	0.038	<0.030	0.03	n/a
	Total HpCDF # Homologues	pg/g	-	2	-	2	-	-	2	-	2	-	-	1	-	0	-	-
	Lower Bound PCDD/F TEQ (WHO 2005)	pg/g	-	0.186	-	0.393	-	71.50	0.0171	-	0.0302	-	55.39	0.00981	-	0.000819	-	169.18
	Mid Point PCDD/F TEQ (WHO 2005)	pg/g	-	0.318	-	0.459	-	36.29	0.0911	-	0.0918	-	0.77	0.0452	-	0.0618	-	31.03
	Upper Bound PCDD/F TEQ (WHO 2005)	pg/g	-	0.394	-	0.505	-	24.69	0.133	-	0.153	-	13.99	0.0786	-	0.117	-	39.26
	Lower Bound PCDD/F TEQ (WHO 1998)	pg/g	-	0.076319	-	0.172617	-	77.37	0.0028734	-	0.0145768	-	134.13	0.0048677	-	0.0000819	-	193.38
	Mid Point PCDD/F TEQ (WHO 1998)	pg/g	-	0.210969	-	0.258912	-	20.41	0.0713684	-	0.0885368	-	21.47	0.0448848	-	0.0678448	-	40.73
	Upper Bound PCDD/F TEQ (WHO 1998)	pg/g	-	0.314819	-	0.319857	-	1.59	0.1179634	-	0.1611468	-	30.94	0.0840748	-	0.1325848	-	44.78

Notes:

RPD > applicable value* and values > 5xDL

RPD > applicable value* and 1 value < 5x DL, 1 value > 5x DL

*applicable RPD values: high variability metals = 60%, other metals = 45%, PAHs = 75%, PCBs, PCDD/Fs = 60%

SS = sample specific

Table 5-1

	Parameter	Unit	DL	PCS08 (0.8-1.06) Split 7 (0.8-1.06)					PCL23 (0-0.5) Split 8 (0-0.5)					PCL23 (0.5-1.0) Split 8 (0.5-1.0)				
				Sample	DL Sample	Field Dup	DL Dup	RPD	Sample	DL Sample	Field Dup	DL Dup	RPD	Sample	DL Sample	Field Dup	DL Dup	RPD
Metals	Aluminum (Al)	mg/kg	50															
	Antimony (Sb)	mg/kg	0.10															
	Arsenic (As)	mg/kg	0.050						5.45	-	5.29	-	2.98	5.77	-	5.73	-	0.70
	Barium (Ba)	mg/kg	0.50															
	Beryllium (Be)	mg/kg	0.20															
	Bismuth (Bi)	mg/kg	0.20															
	Cadmium (Cd)	mg/kg	0.050						0.137	-	0.133	-	2.96	0.157	-	0.148	-	5.90
	Calcium (Ca)	mg/kg	50															
	Chromium (Cr)	mg/kg	0.50						18.2	-	16.6	-	9.20	16.8	-	15.0	-	11.32
	Cobalt (Co)	mg/kg	0.10															
	Copper (Cu)	mg/kg	0.50						11.7	-	10.1	-	14.68	10.5	-	8.82	-	17.39
	Iron (Fe)	mg/kg	50															
	Lead (Pb)	mg/kg	0.50						3.68	-	4.07	-	10.06	3.13	-	2.97	-	5.25
	Lithium (Li)	mg/kg	5.0															
	Magnesium (Mg)	mg/kg	20															
	Manganese (Mn)	mg/kg	1.0															
	Mercury (Hg)	mg/kg	0.0050						0.0176	-	0.0275	-	43.90	0.0132	-	0.0157	-	17.30
	Molybdenum (Mo)	mg/kg	0.50															
	Nickel (Ni)	mg/kg	0.50						9.91	-	9.26	-	6.78	9.96	-	9.07	-	9.35
	Phosphorus (P)	mg/kg	50															
	Potassium (K)	mg/kg	100															
	Selenium (Se)	mg/kg	0.20															
	Silver (Ag)	mg/kg	0.10															
	Sodium (Na)	mg/kg	100															
	Strontium (Sr)	mg/kg	0.50															
	Thallium (Tl)	mg/kg	0.050															
	Tin (Sn)	mg/kg	2.0															
	Titanium (Ti)	mg/kg	1.0															
	Uranium (U)	mg/kg	0.050															
	Vanadium (V)	mg/kg	0.20															
	Zinc (Zn)	mg/kg	1.0						44.4	-	38.7	-	13.72	42.9	-	35.6	-	18.60
Polycyclic Aromatic Hydrocarbons	Acenaphthene	mg/kg	0.050						<0.0050	0.005	<0.0050	0.005	n/a	<0.0050	0.005	<0.0050	0.005	n/a
	Acenaphthylene	mg/kg	0.050						<0.0050	0.005	<0.0050	0.005	n/a	<0.0050	0.005	<0.0050	0.005	n/a
	Anthracene	mg/kg	0.050						<0.0040	0.004	<0.0040	0.004	n/a	<0.0040	0.004	<0.0040	0.004	n/a
	Benz(a)anthracene	mg/kg	0.050						<0.010	0.01	<0.010	0.01	n/a	<0.010	0.01	<0.010	0.01	n/a
	Benzo(a)pyrene	mg/kg	0.050						<0.010	0.01	<0.010	0.01	n/a	<0.010	0.01	<0.010	0.01	n/a
	Benzo(b)fluoranthene	mg/kg	0.050						<0.010	0.01	<0.010	0.01	n/a	<0.010	0.01	<0.010	0.01	n/a
	Benzo(g,h,i)perylene	mg/kg	0.050						<0.010	0.01	<0.010	0.01	n/a	<0.010	0.01	<0.010	0.01	n/a
	Benzo(k)fluoranthene	mg/kg	0.050						<0.010	0.01	<0.010	0.01	n/a	<0.010	0.01	<0.010	0.01	n/a
	Chrysene	mg/kg	0.050						<0.010	0.01	<0.010	0.01	n/a	<0.010	0.01	<0.010	0.01	n/a
	Dibenz(a,h)anthracene	mg/kg	0.050						<0.0050	0.005	<0.0050	0.005	n/a	<0.0050	0.005	<0.0050	0.005	n/a
	Fluoranthene	mg/kg	0.050						<0.010	0.01	<0.010	0.01	n/a	<0.010	0.01	<0.010	0.01	n/a
	Fluorene	mg/kg	0.050						<0.010	0.01	<0.010	0.01	n/a	<0.010	0.01	<0.010	0.01	n/a
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.050						<0.010	0.01	<0.010	0.01	n/a	<0.010	0.01	<0.010	0.01	n/a
	2-Methylnaphthalene	mg/kg	0.010						<0.010	0.01	<0.010	0.01	n/a	<0.010	0.01	<0.010	0.01	n/a
	Naphthalene	mg/kg	0.050						<0.010	0.01	<0.010	0.01	n/a	<0.010	0.01	<0.010	0.01	n/a
	Phenanthrene	mg/kg	0.050						<0.010	0.01	<0.010	0.01	n/a	<0.010	0.01	<0.010	0.01	n/a
	Pyrene	mg/kg	0.050						<0.010	0.01	<0.010	0.01	n/a	<0.010	0.01	<0.010	0.01	n/a
	Total PAHs	mg/kg	0.20						<0.036	0.036	<0.036	0.036	n/a	<0.036	0.036	<0.036	0.036	n/a
Polychlorinated Biphenyls	PCB-1016	mg/kg	0.020						<0.020	0.02	<0.020	0.02	n/a	<0.020	0.02	<0.020	0.02	n/a
	PCB-1221	mg/kg	0.020						<0.020	0.02	<0.020	0.02	n/a	<0.020	0.02	<0.020	0.02	n/a
	PCB-1232	mg/kg	0.020						<0.020	0.02	<0.020	0.02	n/a	<0.020	0.02	<0.020	0.02	n/a
	PCB-1242	mg/kg	0.020						<0.020	0.02	<0.020	0.02	n/a	<0.020	0.02	<0.020	0.02	n/a
	PCB-1248	mg/kg	0.020						<0.020	0.02	<0.020	0.02	n/a	<0.020	0.02	<0.020	0.02	n/a
	PCB-1254	mg/kg	0.020						<0.020	0.02	<0.020	0.02	n/a	<0.020	0.02	<0.020	0.02	n/a
	PCB-1260	mg/kg	0.020						<0.020	0.02	<0.020	0.02	n/a	<0.020	0.02	<0.020	0.02	n/a
	PCB-1262	mg/kg	0.020						<0.020	0.02	<0.020	0.02	n/a	<0.020	0.02	<0.020	0.02	n/a
	PCB-1268	mg/kg	0.020						<0.020	0.02	<0.020	0.02	n/a	<0.020	0.02	<0.020	0.02	n/a
	Total Polychlorinated Biphenyls	mg/kg	0.020						<0.020	0.02	<0.020	0.02	n/a	<0.020	0.02	<0.020	0.02	n/a
Dioxins and Furans	2,3,7,8-TCDD	pg/g	SS	<0.034	0.034	<0.065	0.065	n/a										
	1,2,3,7,8-PeCDD	pg/g	SS	<0.019	0.019	<0.039	0.039	n/a										
	1,2,3,4,7,8-HxCDD	pg/g	SS	<0.027	0.027	<0.076	0.076	n/a										
	1,2,3,6,7,8-HxCDD	pg/g	SS	<0.026	0.026	<0.067	0.067	n/a										
	1,2,3,7,8,9-HxCDD	pg/g	SS	<0.026	0.026	<0.070	0.07	n/a										
	1,2,3,4,6,7,8-HpCDD	pg/g	SS	0.052	0.022	0.069	0.068	28.10										
	OCDD	pg/g	SS	0.257	0.02	0.732	0.087	96.06										
	Total-TCDD	-	-	<0.034	0.034	<0.065	0.065	n/a										
	Total TCDD # Homologues	pg/g	-	0	-	0	-	-										
	Total-PeCDD	-	SS	<0.019	0.019	<0.039	0.039	n/a										
	Total PeCDD # Homologues	pg/g	-	0	-	0	-	-										
	Total-HxCDD	-	SS	<0.027	0.027	<0.076	0.076	n/a										
	Total HxCDD # Homologues	pg/g	-	0	-	0	-	-										
	Total-HpCDD	-	SS	0.052	0.022	0.118	0.068	77.65										
	Total HpCDD # Homologues	pg/g	-	1	-	1	-	-										
	2,3,7,8-TCDF	pg/g	SS	<0.022	0.022	<0.040	0.04	n/a										
	1,2,3,7,8-PeCDF	pg/g	SS	<0.014	0.014	<0.039	0.039	n/a										
	2,3,4,7,8-PeCDF	pg/g	SS	<0.013	0.013	<0.035	0.035	n/a										
	1,2,3,4,7,8-HxCDF	pg/g	SS	<0.015	0.015	<0.036	0.036	n/a										
	1,2,3,6,7,8-HxCDF	pg/g	SS	<0.015	0.015	<0.031	0.031	n/a										
	1,2,3,7,8,9-HxCDF	pg/g	SS	<0.020	0.02	<0.043	0.043	n/a										
	2,3,4,6,7,8-HxCDF	pg/g	SS	<0.014	0.014	<0.030	0.03	n/a										
	1,2,3,4,6,7,8-HpCDF	pg/g	SS	0.016	0.012	<0.063	0.063	n/a										
	1,2,3,4,7,8,9-HpCDF	pg/g	SS	<0.017	0.017	<0.093	0.093	n/a										
	OCDF	pg/g	SS	0.037	0.024	<0.073	0.073	n/a										
	Total-TCDF	pg/g	SS	0.211	0.022	<0.040	0.04	n/a										
	Total TCDF # Homologues	-	-	1	-	0	-	-										
	Total-PeCDF	pg/g	SS	<0.014	0.014	<0.039	0.039	n/a										
	Total PeCDF # Homologues	-	-	0	-	0	-	-										
	Total-HxCDF	pg/g	SS	<0.020	0.02	<0.043	0.043	n/a										
	Total HxCDF # Homologues	-	-	0	-	0	-	-										
	Total-HpCDF	pg/g	SS	<0.017	0.017	<0.093	0.093	n/a										
	Total HpCDF # Homologues	pg/g	-	0	-	0	-	-										
	Lower Bound PCDD/F TEQ (WHO 2005)	pg/g	-	0.000597	-	0.00022	-	92.29										
	Mid Point PCDD/F TEQ (WHO 2005)	pg/g	-	0.0389	-	0.0792	-	68.25										
	Upper Bound PCDD/F TEQ (WHO 2005)	pg/g	-	0.0748	-	0.157	-	70.92										
	Lower Bound PCDD/F TEQ (WHO 1998)	pg/g	-	0.0000777	-	0.0000732	-	5.96										
	Mid Point PCDD/F TEQ (WHO 1998)	pg/g	-	0.0411864	-	0.09033585	-	74.74										
	Upper Bound PCDD/F TEQ (WHO 1998)	pg/g	-	0.0821314	-	0.1805295	-	74.92										

Notes:

RPD > applicable value* and values > 5xDL

RPD > applicable value* and 1 value < 5x DL, 1 value > 5x DL

*applicable RPD values: high variability metals = 60%, other metals = 45%, PAHs = 75%, PCBs, PCDD/Fs = 60%

SS = sample specific

Table 5-1

	Parameter	Unit	DL	PCL23 (1.0-1.5) Split 8 (1.0-1.5)					PCL23 (1.5-2.0) Split 8 (1.5-2.0)				
				Sample	DL Sample	Field Dup	DL Dup	RPD	Sample	DL Sample	Field Dup	DL Dup	RPD
Metals	Aluminum (Al)	mg/kg	50										
	Antimony (Sb)	mg/kg	0.10										
	Arsenic (As)	mg/kg	0.050	5.91	-	6.32	-	6.70					
	Barium (Ba)	mg/kg	0.50										
	Beryllium (Be)	mg/kg	0.20										
	Bismuth (Bi)	mg/kg	0.20										
	Cadmium (Cd)	mg/kg	0.050	0.204	-	0.240	-	16.22					
	Calcium (Ca)	mg/kg	50										
	Chromium (Cr)	mg/kg	0.50	14.5	-	13.2	-	9.39					
	Cobalt (Co)	mg/kg	0.10										
	Copper (Cu)	mg/kg	0.50	9.23	-	8.55	-	7.65					
	Iron (Fe)	mg/kg	50										
	Lead (Pb)	mg/kg	0.50	2.86	-	2.79	-	2.48					
	Lithium (Li)	mg/kg	5.0										
	Magnesium (Mg)	mg/kg	20										
	Manganese (Mn)	mg/kg	1.0										
	Mercury (Hg)	mg/kg	0.0050	0.0158	-	0.0165	-	4.33					
	Molybdenum (Mo)	mg/kg	0.50										
	Nickel (Ni)	mg/kg	0.50	9.08	-	8.72	-	4.04					
	Phosphorus (P)	mg/kg	50										
	Potassium (K)	mg/kg	100										
	Selenium (Se)	mg/kg	0.20										
	Silver (Ag)	mg/kg	0.10										
	Sodium (Na)	mg/kg	100										
	Strontium (Sr)	mg/kg	0.50										
	Thallium (Tl)	mg/kg	0.050										
	Tin (Sn)	mg/kg	2.0										
	Titanium (Ti)	mg/kg	1.0										
	Uranium (U)	mg/kg	0.050										
	Vanadium (V)	mg/kg	0.20										
	Zinc (Zn)	mg/kg	1.0	34.9	-	31.2	-	11.20					
Polycyclic Aromatic Hydrocarbons	Acenaphthene	mg/kg	0.050	<0.0050	0.005	<0.0050	0.005	n/a					
	Acenaphthylene	mg/kg	0.050	<0.0050	0.005	<0.0050	0.005	n/a					
	Anthracene	mg/kg	0.050	<0.0040	0.004	<0.0040	0.004	n/a					
	Benz(a)anthracene	mg/kg	0.050	<0.010	0.01	<0.010	0.01	n/a					
	Benzo(a)pyrene	mg/kg	0.050	<0.010	0.01	<0.010	0.01	n/a					
	Benzo(b)fluoranthene	mg/kg	0.050	<0.010	0.01	<0.010	0.01	n/a					
	Benzo(g,h,i)perylene	mg/kg	0.050	<0.010	0.01	<0.010	0.01	n/a					
	Benzo(k)fluoranthene	mg/kg	0.050	<0.010	0.01	<0.010	0.01	n/a					
	Chrysene	mg/kg	0.050	<0.010	0.01	<0.010	0.01	n/a					
	Dibenz(a,h)anthracene	mg/kg	0.050	<0.0050	0.005	<0.0050	0.005	n/a					
	Fluoranthene	mg/kg	0.050	<0.010	0.01	<0.010	0.01	n/a					
	Fluorene	mg/kg	0.050	<0.010	0.01	<0.010	0.01	n/a					
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.050	<0.010	0.01	<0.010	0.01	n/a					
	2-Methylnaphthalene	mg/kg	0.010	<0.010	0.01	<0.010	0.01	n/a					
	Naphthalene	mg/kg	0.050	<0.010	0.01	<0.010	0.01	n/a					
	Phenanthrene	mg/kg	0.050	<0.010	0.01	<0.010	0.01	n/a					
	Pyrene	mg/kg	0.050	<0.010	0.01	<0.010	0.01	n/a					
	Total PAHs	mg/kg	0.20	<0.036	0.036	<0.036	0.036	n/a					
Polychlorinated Biphenyls	PCB-1016	mg/kg	0.020	<0.020	0.02	<0.020	0.02	n/a					
	PCB-1221	mg/kg	0.020	<0.020	0.02	<0.020	0.02	n/a					
	PCB-1232	mg/kg	0.020	<0.020	0.02	<0.020	0.02	n/a					
	PCB-1242	mg/kg	0.020	<0.020	0.02	<0.020	0.02	n/a					
	PCB-1248	mg/kg	0.020	<0.020	0.02	<0.020	0.02	n/a					
	PCB-1254	mg/kg	0.020	<0.020	0.02	<0.020	0.02	n/a					
	PCB-1260	mg/kg	0.020	<0.020	0.02	<0.020	0.02	n/a					
	PCB-1262	mg/kg	0.020	<0.020	0.02	<0.020	0.02	n/a					
	PCB-1268	mg/kg	0.020	<0.020	0.02	<0.020	0.02	n/a					
	Total Polychlorinated Biphenyls	mg/kg	0.020	<0.020	0.02	<0.020	0.02	n/a					
Dioxins and Furans	2,3,7,8-TCDD	pg/g	SS										
	1,2,3,7,8-PeCDD	pg/g	SS										
	1,2,3,4,7,8-HxCDD	pg/g	SS										
	1,2,3,6,7,8-HxCDD	pg/g	SS										
	1,2,3,7,8,9-HxCDD	pg/g	SS										
	1,2,3,4,6,7,8-HpCDD	pg/g	SS										
	OCDD	pg/g	SS										
	Total-TCDD	-	-										
	Total TCDD # Homologues	pg/g	-										
	Total-PeCDD	-	SS										
	Total PeCDD # Homologues	pg/g	-										
	Total-HxCDD	-	SS										
	Total HxCDD # Homologues	pg/g	-										
	Total-HpCDD	-	SS										
	Total HpCDD # Homologues	pg/g	-										
	2,3,7,8-TCDF	pg/g	SS										
	1,2,3,7,8-PeCDF	pg/g	SS										
	2,3,4,7,8-PeCDF	pg/g	SS										
	1,2,3,4,7,8-HxCDF	pg/g	SS										
	1,2,3,6,7,8-HxCDF	pg/g	SS										
	1,2,3,7,8,9-HxCDF	pg/g	SS										
	2,3,4,6,7,8-HxCDF	pg/g	SS										
	1,2,3,4,6,7,8-HpCDF	pg/g	SS										
	1,2,3,4,7,8,9-HpCDF	pg/g	SS										
	OCDF	pg/g	SS										
	Total-TCDF	pg/g	SS										
	Total TCDF # Homologues	-	-										
	Total-PeCDF	pg/g	SS										
	Total PeCDF # Homologues	-	-										
	Total-HxCDF	pg/g	SS										
	Total HxCDF # Homologues	-	-										
	Total-HpCDF	pg/g	SS										
	Total HpCDF # Homologues	pg/g	-										
	Lower Bound PCDD/F TEQ (WHO 2005)	pg/g	-										
	Mid Point PCDD/F TEQ (WHO 2005)	pg/g	-										
	Upper Bound PCDD/F TEQ (WHO 2005)	pg/g	-										
	Lower Bound PCDD/F TEQ (WHO 1998)	pg/g	-										
	Mid Point PCDD/F TEQ (WHO 1998)	pg/g	-										
	Upper Bound PCDD/F TEQ (WHO 1998)	pg/g	-										

Notes:

RPD > applicable value* and values > 5xDL

RPD > applicable value* and 1 value < 5x DL, 1 value > 5x DL

*applicable RPD values: high variability metals = 60%, other metals = 45%, PAHs = 75%, PCBs, PCDD/Fs = 60%

SS = sample specific

Table 5-1

	Parameter	Unit	DL	PCL23 (2.0-2.2) Split 8 (2.0-2.2)					SS13 Split 9				
				Sample	DL Sample	Field Dup	DL Dup	RPD	Sample	DL Sample	Field Dup	DL Dup	RPD
Metals	Aluminum (Al)	mg/kg	50										
	Antimony (Sb)	mg/kg	0.10										
	Arsenic (As)	mg/kg	0.050						9.14	-	10.4	-	12.90
	Barium (Ba)	mg/kg	0.50										
	Beryllium (Be)	mg/kg	0.20										
	Bismuth (Bi)	mg/kg	0.20										
	Cadmium (Cd)	mg/kg	0.050						0.181	-	0.183	-	1.10
	Calcium (Ca)	mg/kg	50										
	Chromium (Cr)	mg/kg	0.50						25.1	-	27.2	-	8.03
	Cobalt (Co)	mg/kg	0.10										
	Copper (Cu)	mg/kg	0.50						35.2	-	38.8	-	9.73
	Iron (Fe)	mg/kg	50										
	Lead (Pb)	mg/kg	0.50						10.4	-	10.5	-	0.96
	Lithium (Li)	mg/kg	5.0										
	Magnesium (Mg)	mg/kg	20										
	Manganese (Mn)	mg/kg	1.0										
	Mercury (Hg)	mg/kg	0.0050						0.062	-	0.0785	-	23.49
	Molybdenum (Mo)	mg/kg	0.50										
	Nickel (Ni)	mg/kg	0.50						19.9	-	22.3	-	11.37
	Phosphorus (P)	mg/kg	50										
	Potassium (K)	mg/kg	100										
	Selenium (Se)	mg/kg	0.20										
	Silver (Ag)	mg/kg	0.10										
	Sodium (Na)	mg/kg	100										
	Strontium (Sr)	mg/kg	0.50										
	Thallium (Tl)	mg/kg	0.050										
	Tin (Sn)	mg/kg	2.0										
	Titanium (Ti)	mg/kg	1.0										
	Uranium (U)	mg/kg	0.050										
	Vanadium (V)	mg/kg	0.20										
	Zinc (Zn)	mg/kg	1.0						80.3	-	86.2	-	7.09
Polycyclic Aromatic Hydrocarbons	Acenaphthene	mg/kg	0.050						0.0063	0.0050	<0.0050	0.0050	n/a
	Acenaphthylene	mg/kg	0.050						0.0064	0.0050	<0.0050	0.0050	n/a
	Anthracene	mg/kg	0.050						0.0255	0.0040	0.0125	0.0040	92.86
	Benz(a)anthracene	mg/kg	0.050						0.055	0.010	0.028	0.010	87.10
	Benzo(a)pyrene	mg/kg	0.050						0.051	0.010	0.024	0.010	95.29
	Benzo(b)fluoranthene	mg/kg	0.050						0.089	0.010	0.047	0.010	86.30
	Benzo(g,h,i)perylene	mg/kg	0.050						0.04	0.010	0.02	0.010	85.714
	Benzo(k)fluoranthene	mg/kg	0.050						0.032	0.010	0.017	0.010	76.271
	Chrysene	mg/kg	0.050						0.08	0.010	0.04	0.010	92.31
	Dibenz(a,h)anthracene	mg/kg	0.050						0.0086	0.0050	<0.0050	0.0050	n/a
	Fluoranthene	mg/kg	0.050						0.143	0.010	0.06	0.010	116.90
	Fluorene	mg/kg	0.050						0.014	0.010	<0.010	0.010	n/a
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.050						0.028	0.010	0.014	0.010	80.769
	2-Methylnaphthalene	mg/kg	0.010						0.026	0.010	0.017	0.010	50.943
	Naphthalene	mg/kg	0.050						0.014	0.010	<0.010	0.010	n/a
	Phenanthrene	mg/kg	0.050						0.075	0.010	0.029	0.010	121.05
	Pyrene	mg/kg	0.050						0.119	0.010	0.051	0.010	113.33
	Total PAHs	mg/kg	0.20						0.724	0.010	0.311	0.010	118.56
Polychlorinated Biphenyls	PCB-1016	mg/kg	0.020						<0.020	0.02	<0.020	0.02	n/a
	PCB-1221	mg/kg	0.020						<0.020	0.02	<0.020	0.02	n/a
	PCB-1232	mg/kg	0.020						<0.020	0.02	<0.020	0.02	n/a
	PCB-1242	mg/kg	0.020						<0.020	0.02	<0.020	0.02	n/a
	PCB-1248	mg/kg	0.020						<0.020	0.02	<0.020	0.02	n/a
	PCB-1254	mg/kg	0.020						<0.020	0.02	<0.020	0.02	n/a
	PCB-1260	mg/kg	0.020						<0.020	0.02	<0.020	0.02	n/a
	PCB-1262	mg/kg	0.020						<0.020	0.02	<0.020	0.02	n/a
	PCB-1268	mg/kg	0.020						<0.020	0.02	<0.020	0.02	n/a
	Total Polychlorinated Biphenyls	mg/kg	0.020						<0.020	0.02	<0.020	0.02	n/a
Dioxins and Furans	2,3,7,8-TCDD	pg/g	SS						<0.33	0.33	0.48	0.13	n/a
	1,2,3,7,8-PeCDD	pg/g	SS						0.71	0.27	0.88	0.15	21.38
	1,2,3,4,7,8-HxCDD	pg/g	SS						<0.39	0.39	<0.26	0.26	n/a
	1,2,3,6,7,8-HxCDD	pg/g	SS						6.1	0.36	6.21	0.24	1.79
	1,2,3,7,8,9-HxCDD	pg/g	SS						2.76	0.37	2.43	0.25	12.72
	1,2,3,4,6,7,8-HpCDD	pg/g	SS						30	0.65	25.2	0.33	17.39
	OCDD	pg/g	SS						175	1	149	0.54	16.05
	Total-TCDD	-	-						0.7	0.33	1.47	0.13	70.97
	Total TCDD # Homologues	pg/g	-						2		3		-
	Total-PeCDD	-	SS						3.19	0.27	3.72	0.15	15.34
	Total PeCDD # Homologues	pg/g	-						3		4		-
	Total-HxCDD	-	SS						55.1	0.39	41.2	0.26	28.87
	Total HxCDD # Homologues	pg/g	-						4		3		-
	Total-HpCDD	-	SS						75.5	0.65	68.4	0.33	9.87
	Total HpCDD # Homologues	pg/g	-						2		2		-
	2,3,7,8-TCDF	pg/g	SS						18.3	0.3	14.8	0.13	21.15
	1,2,3,7,8-PeCDF	pg/g	SS						0.37	0.26	0.26	0.1	34.92
	2,3,4,7,8-PeCDF	pg/g	SS						0.34	0.22	0.41	0.094	18.67
	1,2,3,4,7,8-HxCDF	pg/g	SS						<0.39	0.39	0.14	0.12	n/a
	1,2,3,6,7,8-HxCDF	pg/g	SS						<0.36	0.36	<0.11	0.11	n/a
	1,2,3,7,8,9-HxCDF	pg/g	SS						<0.53	0.53	<0.14	0.14	n/a
	2,3,4,6,7,8-HxCDF	pg/g	SS						<0.34	0.34	0.3	0.11	n/a
	1,2,3,4,6,7,8-HpCDF	pg/g	SS						6.83	0.39	4.88	0.15	33.30
	1,2,3,4,7,8,9-HpCDF	pg/g	SS						<0.61	0.61	<0.22	0.22	n/a
	OCDF	pg/g	SS						15.3	0.31	14.1	0.15	8.16
	Total-TCDF	pg/g	SS						30.2	0.3	29.8	0.13	1.33
	Total TCDF # Homologues	-	-						4		8		-
	Total-PeCDF	pg/g	SS						3.98	0.26	4	0.1	0.50
	Total PeCDF # Homologues	-	-						4		5		-
	Total-HxCDF	pg/g	SS						7.73	0.53	5.06	0.14	41.75
	Total HxCDF # Homologues	-	-						2		4		-
	Total-HpCDF	pg/g	SS						19.7	0.61	15	0.22	27.09
	Total HpCDF # Homologues	pg/g	-						2		2		-
	Lower Bound PCDD/F TEQ (WHO 2005)	pg/g	-						3.85	-	4.09	-	6.05
	Mid Point PCDD/F TEQ (WHO 2005)	pg/g	-						4.24	-	4.26	-	0.47
	Upper Bound PCDD/F TEQ (WHO 2005)	pg/g	-						4.5	-	4.28	-	5.01
	Lower Bound PCDD/F TEQ (WHO 1998)	pg/g	-						1.83393	-	2.32271	-	23.52
	Mid Point PCDD/F TEQ (WHO 1998)	pg/g	-						2.36898	-	2.62031	-	10.07
	Upper Bound PCDD/F TEQ (WHO 1998)	pg/g	-						2.71553	-	2.69891	-	0.61

Notes:

RPD > applicable value* and values > 5xDL

RPD > applicable value* and 1 value < 5x DL, 1 value > 5x DL

*applicable RPD values: high variability metals = 60%, other metals = 45%, PAHs = 75%, PCBs, PCDD/Fs = 60%

SS = sample specific

Table 5-2

	Unit	DL	WQ_PM_FLOOD_1M 19-Dec-14 Rep 1	Rep 2	RPD (%)
Physical Tests					
Conductivity	uS/cm	2.0	43700	43700	0.0
Hardness (as CaCO3)	mg/L	4.3	5120	5030	1.8
pH	pH	0.10	7.91	7.93	0.3
Salinity	psu	1.0	28.3	28.3	0.0
Total Suspended Solids	mg/L	2.0	<2.0	<2.0	n/a
Anions and Nutrients					
Alkalinity, Bicarbonate (as CaCO3)	mg/L	2.0	123	122	0.8
Alkalinity, Carbonate (as CaCO3)	mg/L	2.0	<2.0	<2.0	n/a
Alkalinity, Hydroxide (as CaCO3)	mg/L	2.0	<2.0	<2.0	n/a
Alkalinity, Total (as CaCO3)	mg/L	2.0	123	122	0.8
Ammonia, Total (as N)	mg/L	0.0050	<0.0050	<0.0050	n/a
Bromide (Br)	mg/L	5.0	57.5	53.8	6.6
Chloride (Cl)	mg/L	50	16800	15800	6.1
Fluoride (F)	mg/L	0.75	1.12	1.14	1.8
Nitrate (as N)	mg/L	0.50	0.56	0.59	5.2
Nitrite (as N)	mg/L	0.10	<0.10	<0.10	n/a
Total Nitrogen	mg/L	0.25	0.26	0.27	3.8
Phosphorus (P)-Total	mg/L	0.010	0.050	0.051	2.0
Sulfate (SO4)	mg/L	50	2370	2200	7.4
Total Metals					
Aluminum (Al)-Total	mg/L	0.0050	0.0186	0.0139	28.9
Antimony (Sb)-Total	mg/L	0.00050	<0.00050	<0.00050	n/a
Arsenic (As)-Total	mg/L	0.0020	<0.0020	<0.0020	n/a
Barium (Ba)-Total	mg/L	0.0010	0.0079	0.0079	0.0
Beryllium (Be)-Total	mg/L	0.00050	<0.00050	<0.00050	n/a
Bismuth (Bi)-Total	mg/L	0.00050	<0.00050	<0.00050	n/a
Boron (B)-Total	mg/L	0.10	4.01	3.76	6.4
Cadmium (Cd)-Total	mg/L	0.000050	<0.000050	<0.000050	n/a
Calcium (Ca)-Total	mg/L	0.50	340	329	3.3
Cesium (Cs)-Total	mg/L	0.00050	<0.00050	<0.00050	n/a
Chromium (Cr)-Total	mg/L	0.00050	<0.00050	<0.00050	n/a
Cobalt (Co)-Total	mg/L	0.000050	<0.000050	<0.000050	n/a
Copper (Cu)-Total	mg/L	0.00050	0.00089	0.00170	62.5
Gallium (Ga)-Total	mg/L	0.00050	<0.00050	<0.00050	n/a
Iron (Fe)-Total	mg/L	0.010	0.033	0.032	3.1
Lead (Pb)-Total	mg/L	0.00030	<0.00030	<0.00030	n/a
Lithium (Li)-Total	mg/L	0.020	0.136	0.138	1.5
Magnesium (Mg)-Total	mg/L	1.0	1040	1020	1.9
Manganese (Mn)-Total	mg/L	0.00020	0.00391	0.00377	3.6
Molybdenum (Mo)-Total	mg/L	0.0020	0.0085	0.0086	1.2
Nickel (Ni)-Total	mg/L	0.00050	<0.00050	<0.00050	n/a
Phosphorus (P)-Total	mg/L	1.0	<1.0	<1.0	n/a
Potassium (K)-Total	mg/L	20	314	305	2.9
Rhenium (Re)-Total	mg/L	0.00050	<0.00050	<0.00050	n/a
Rubidium (Rb)-Total	mg/L	0.0050	0.115	0.110	4.4
Selenium (Se)-Total	mg/L	0.0020	<0.0020	<0.0020	n/a
Silicon (Si)-Total	mg/L	0.50	0.97	0.95	2.1
Silver (Ag)-Total	mg/L	0.00010	<0.00010	<0.00010	n/a
Sodium (Na)-Total	mg/L	20	9120	8810	3.5
Strontium (Sr)-Total	mg/L	0.050	6.21	5.98	3.8
Tellurium (Te)-Total	mg/L	0.00050	<0.00050	<0.00050	n/a
Thallium (Tl)-Total	mg/L	0.000050	<0.000050	<0.000050	n/a
Thorium (Th)-Total	mg/L	0.00050	<0.00050	<0.00050	n/a
Tin (Sn)-Total	mg/L	0.0010	<0.0010	<0.0010	n/a
Titanium (Ti)-Total	mg/L	0.0050	<0.0050	<0.0050	n/a
Tungsten (W)-Total	mg/L	0.0010	<0.0010	<0.0010	n/a
Uranium (U)-Total	mg/L	0.000050	0.00247	0.00240	2.9
Vanadium (V)-Total	mg/L	0.00050	0.00141	0.00140	0.7
Yttrium (Y)-Total	mg/L	0.00050	<0.00050	<0.00050	n/a
Zinc (Zn)-Total	mg/L	0.0030	<0.0030	<0.0030	n/a
Zirconium (Zr)-Total	mg/L	0.00050	<0.00050	<0.00050	n/a
Plant Pigments					
Chlorophyll a	ug/L	0.010	<0.010	<0.010	n/a

Notes:

RPD > 30% and values > 5xDL

Table 5-3

Sample ID	TRIP_BLANK
Date Sampled	16-DEC-14
Time Sampled	00:00
ALS Sample ID	L1560366-6
Matrix	Water
Physical Tests	
Conductivity	<2.0
Hardness (as CaCO3)	<0.50
pH	5.77
Salinity	<1.0
Total Suspended Solids	<3.0
Anions and Nutrients	
Alkalinity, Bicarbonate (as CaCO3)	<2.0
Alkalinity, Carbonate (as CaCO3)	<2.0
Alkalinity, Hydroxide (as CaCO3)	<2.0
Alkalinity, Total (as CaCO3)	<2.0
Ammonia, Total (as N)	<0.0050
Bromide (Br)	<0.050
Chloride (Cl)	<0.50
Fluoride (F)	-
Nitrate (as N)	<0.0050
Nitrite (as N)	<0.0010
Total Nitrogen	<0.050
Phosphorus (P)-Total	<0.0020
Sulfate (SO4)	<0.30
Total Metals	
Aluminum (Al)-Total	<0.0030
Antimony (Sb)-Total	<0.000010
Arsenic (As)-Total	<0.000050
Barium (Ba)-Total	<0.00010
Beryllium (Be)-Total	<0.0000050
Bismuth (Bi)-Total	<0.000050
Boron (B)-Total	0.0060
Cadmium (Cd)-Total	<0.0000050
Calcium (Ca)-Total	<0.050
Cesium (Cs)-Total	<0.0000050
Chromium (Cr)-Total	<0.00050
Cobalt (Co)-Total	<0.000050
Copper (Cu)-Total	<0.00050
Gallium (Ga)-Total	<0.000050
Iron (Fe)-Total	<0.030
Lead (Pb)-Total	<0.000050
Lithium (Li)-Total	<0.00020
Magnesium (Mg)-Total	<0.10
Manganese (Mn)-Total	<0.00020
Molybdenum (Mo)-Total	<0.000050
Nickel (Ni)-Total	<0.00020
Phosphorus (P)-Total	<0.30
Potassium (K)-Total	<2.0
Rhenium (Re)-Total	<0.0000050
Rubidium (Rb)-Total	<0.000020
Selenium (Se)-Total	<0.00020
Silicon (Si)-Total	<0.050
Silver (Ag)-Total	<0.0000050
Sodium (Na)-Total	<2.0
Strontium (Sr)-Total	<0.000050
Tellurium (Te)-Total	<0.000010
Thallium (Tl)-Total	<0.0000020
Thorium (Th)-Total	<0.0000050
Tin (Sn)-Total	<0.00020
Titanium (Ti)-Total	<0.00020
Tungsten (W)-Total	<0.000010
Uranium (U)-Total	<0.0000020
Vanadium (V)-Total	<0.000050
Yttrium (Y)-Total	<0.0000050
Zinc (Zn)-Total	<0.0030
Zirconium (Zr)-Total	<0.000050
Plant Pigments	
Chlorophyll a	<0.010

APPENDIX 6

Summary of Sediment Analytical Results

Table 6-1 Berth 1: Surface Samples Summary Stats

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	9	35.6	44.9	41.0	40.9	3.33	0.08	0
% Gravel (>2mm)	9	0.16	11.2	2.59	1.58	3.45	1.33	0
% Sand (2.00mm - 0.063mm)	9	9.97	63.2	30.9	28.5	15.6	0.51	0
% Silt (0.063mm - 0.004mm)	9	19.0	61.0	44.7	47.2	12.3	0.28	0
% Clay (<4um)	9	6.54	29.0	21.8	22.0	6.66	0.30	0
Total Organic Carbon	**9**	**1.47**	**2.10**	**1.67**	**1.56**	**0.21**	**0.13**	**0**

Table 6-2 Berth 1: Primarily Core - Large Summary Stats (0 - 0.5 m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	10	26.3	38.4	31.2	30.6	3.89	0.13	0
% Gravel (>2mm)	10	0.22	6.69	1.63	0.92	2.11	1.29	1
% Sand (2.00mm - 0.063mm)	10	17.5	73.5	47.3	46.7	17.7	0.37	0
% Silt (0.063mm - 0.004mm)	10	12.3	53.1	33.2	33.8	12.8	0.39	0
% Clay (<4um)	10	7.41	29.2	18.1	18.6	6.45	0.36	0
Total Organic Carbon	**10**	**0.80**	**1.91**	**1.31**	**1.21**	**0.39**	**0.30**	**0**

Table 6-3 Berth 1: Primarily Core - Large Summary Stats (0.5 - 1.0 m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	9	24.4	32.3	27.7	27.2	2.91	0.11	0
% Gravel (>2mm)	9	0.18	8.80	3.54	1.45	3.44	0.97	1
% Sand (2.00mm - 0.063mm)	9	36.5	76.6	60.9	66.5	13.9	0.23	0
% Silt (0.063mm - 0.004mm)	9	8.83	41.6	23.3	18.0	11.4	0.49	0
% Clay (<4um)	9	6.71	21.7	12.3	9.85	5.05	0.41	0
Total Organic Carbon	**9**	**0.63**	**1.40**	**1.02**	**1.01**	**0.29**	**0.28**	**0**

Table 6-4 Berth 1: Primarily Core - Large Summary Stats (1.0 - 1.5[a] m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	9	17.3	35.0	24.2	20.9	6.23	0.26	0
% Gravel (>2mm)	9	0.12	16.0	6.39	6.75	5.61	0.88	0
% Sand (2.00mm - 0.063mm)	9	40.6	76.8	62.9	64.7	10.5	0.17	0
% Silt (0.063mm - 0.004mm)	9	9.16	38.7	20.0	21.5	9.06	0.45	0
% Clay (<4um)	9	5.61	19.6	10.8	7.30	5.20	0.48	0
Total Organic Carbon	**9**	**0.38**	**1.77**	**0.94**	**0.65**	**0.52**	**0.56**	**0**

NOTE:

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

Table 6-5 Berth 1: Primarily Core - Large Summary Stats (1.5 - 2.0[a] m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	5	17.6	36.3	27.0	27.4	6.80	0.25	0
% Gravel (>2mm)	5	0.18	7.99	2.66	0.91	3.31	1.24	0
% Sand (2.00mm - 0.063mm)	5	33.3	78.4	55.2	52.1	17.7	0.32	0
% Silt (0.063mm - 0.004mm)	5	7.07	44.8	27.0	30.9	14.0	0.52	0
% Clay (<4um)	5	6.73	21.5	15.1	16.1	5.98	0.39	0
Total Organic Carbon	**0**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**

NOTES:

n/a not available; TOC not analyzed in samples >1.5 m depth.

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

Table 6-6 Berth 1: Primarily Core - Large Summary Stats (>2.0[a] m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	2	26.8	32.3	29.6	29.6	3.89	0.13	0
% Gravel (>2mm)	2	1.15	1.62	1.39	1.39	0.33	0.24	0
% Sand (2.00mm - 0.063mm)	2	38.2	70.2	54.2	54.2	22.7	0.42	0
% Silt (0.063mm - 0.004mm)	2	19.1	38.8	29.0	29.0	13.9	0.48	0
% Clay (<4um)	2	9.51	21.4	15.5	15.5	8.41	0.54	0
Total Organic Carbon	**0**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**

NOTES:

n/a not available; TOC not analyzed in samples >1.5 m depth.

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

Table 6-7 Berth 1: Primarily Core - Small Summary Stats (0 - 0.2 m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	5	28.7	41.6	33.0	31.3	5.14	0.16	0
% Gravel (>2mm)	5	0.11	4.51	1.10	0.32	1.91	1.74	0
% Sand (2.00mm - 0.063mm)	5	15.8	69.2	44.3	42.1	19.5	0.44	0
% Silt (0.063mm - 0.004mm)	5	16.4	54.4	35.5	36.4	13.6	0.38	0
% Clay (<4um)	5	9.9	29.7	19.1	19.0	7.39	0.39	0
Total Organic Carbon	5	1.12	1.74	1.38	1.28	0.24	0.17	0

Table 6-8 Berth 1: Primarily Core - Small Summary Stats (0.2 - 0.4 m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	5	21.7	37.5	27.3	25.5	6.09	0.22	0
% Gravel (>2mm)	5	0.10	6.61	2.16	0.38	2.89	1.34	0
% Sand (2.00mm - 0.063mm)	5	20.9	72.3	52.1	57.4	19.9	0.38	0
% Silt (0.063mm - 0.004mm)	5	13.0	50.5	29.7	28.2	14.2	0.48	0
% Clay (<4um)	5	8.19	28.4	16.1	14.2	7.90	0.49	0
Total Organic Carbon	**5**	**0.79**	**2.11**	**1.32**	**1.07**	**0.55**	**0.42**	**0**

Table 6-9 Berth 1: Primarily Core - Small Summary Stats (0.4 - 0.6 m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	5	21.8	32.6	26.0	24.3	4.22	0.16	0
% Gravel (>2mm)	5	0.55	6.70	2.58	1.29	2.61	1.01	0
% Sand (2.00mm - 0.063mm)	5	30.2	73.0	58.1	63.1	17.4	0.30	0
% Silt (0.063mm - 0.004mm)	5	12.3	47.1	25.7	23.4	13.8	0.54	0
% Clay (<4um)	5	8.02	21.9	13.6	12.1	5.57	0.41	0
Total Organic Carbon	**5**	**0.65**	**1.42**	**0.99**	**0.96**	**0.28**	**0.28**	**0**

Table 6-10 Berth 1: Primarily Core - Small Summary Stats (0.6 - 0.8[a] m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	5	21.4	32.2	25.2	24.7	4.13	0.16	0
% Gravel (>2mm)	5	0.21	7.58	2.83	0.75	3.25	1.15	0
% Sand (2.00mm - 0.063mm)	5	34.8	75.4	63.2	71.5	16.5	0.26	0
% Silt (0.063mm - 0.004mm)	5	11.7	44.1	22.5	18.4	13.2	0.59	0
% Clay (<4um)	5	7.75	20.9	11.5	9.28	5.48	0.48	0
Total Organic Carbon	**5**	**0.78**	**1.44**	**1.01**	**0.85**	**0.27**	**0.27**	**0**

NOTE:

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

Table 6-11 Berth 1: Primarily Core - Small Summary Stats (0.8 - 1.0[a] m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	4	22.1	32.7	25.5	23.7	4.89	0.19	0
% Gravel (>2mm)	4	0.74	7.74	4.20	4.15	3.96	0.94	0
% Sand (2.00mm - 0.063mm)	4	35.8	75.6	62.0	68.3	17.9	0.29	0
% Silt (0.063mm - 0.004mm)	4	13.6	42.7	22.4	16.6	13.7	0.61	0
% Clay (<4um)	4	7.99	20.8	11.4	8.46	6.25	0.55	0
Total Organic Carbon	**4**	**0.65**	**1.45**	**1.02**	**0.99**	**0.40**	**0.39**	**0**

NOTE:

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

Table 6-12 Berth 2: Surface Samples Summary Stats

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	6	37.1	49.6	45.5	46.4	4.50	0.10	0
% Gravel (>2mm)	6	1.34	7.74	3.24	1.91	2.62	0.81	1
% Sand (2.00mm - 0.063mm)	6	4.31	48.8	17.2	11.7	16.6	0.97	0
% Silt (0.063mm - 0.004mm)	6	26.9	62.1	51.9	56.4	13.6	0.26	0
% Clay (<4um)	6	16.6	33.6	28.2	29.6	5.91	0.21	0
Total Organic Carbon	**6**	**1.35**	**1.60**	**1.48**	**1.46**	**0.09**	**0.06**	**0**

Table 6-13 Berth 2: Primarily Core - Large Summary Stats (0 - 0.5 m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	6	31.9	38.5	35.6	35.7	2.25	0.06	0
% Gravel (>2mm)	6	0.31	6.38	2.54	2.79	2.48	0.98	1
% Sand (2.00mm - 0.063mm)	6	3.17	43.8	21.8	19.5	19.8	0.91	0
% Silt (0.063mm - 0.004mm)	6	35.3	65.9	50.0	49.7	15.5	0.31	0
% Clay (<4um)	6	17.6	32.9	26.1	26.9	6.43	0.25	0
Total Organic Carbon	**6**	**1.16**	**1.98**	**1.37**	**1.27**	**0.30**	**0.22**	**0**

Table 6-14 Berth 2: Primarily Core - Large Summary Stats (0.5 - 1.0 m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	4	28.4	37.0	32.0	31.4	3.93	0.12	0
% Gravel (>2mm)	4	0.98	5.47	3.57	3.92	2.01	0.56	0
% Sand (2.00mm - 0.063mm)	4	17.1	55.2	31.0	25.8	16.7	0.54	0
% Silt (0.063mm - 0.004mm)	4	28.4	53.6	45.6	50.2	11.6	0.25	0
% Clay (<4um)	4	11.0	26.3	19.9	21.1	6.44	0.32	0
Total Organic Carbon	**4**	**0.84**	**1.05**	**0.95**	**0.96**	**0.09**	**0.09**	**0**

Table 6-15 Berth 2: Primarily Core - Large Summary Stats (1.0 - 1.5[a] m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	4	21.4	29.8	26.1	26.7	3.52	0.13	0
% Gravel (>2mm)	4	3.89	8.67	6.14	5.99	1.98	0.32	0
% Sand (2.00mm - 0.063mm)	4	39.9	64.7	56.7	61.0	11.5	0.20	0
% Silt (0.063mm - 0.004mm)	4	17.6	40.1	26.3	23.7	10.0	0.38	0
% Clay (<4um)	4	9.03	14.5	11.0	10.3	2.42	0.22	0
Total Organic Carbon	**4**	**0.62**	**0.88**	**0.77**	**0.79**	**0.11**	**0.15**	**0**

NOTE:

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

Table 6-16 Berth 2: Primarily Core - Large Summary Stats (1.5 - 2.0 m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	2	14.0	14.5	14.3	14.3	0.35	0.02	0
% Gravel (>2mm)	2	2.45	5.03	3.74	3.74	1.82	0.49	0
% Sand (2.00mm - 0.063mm)	2	54.4	64.5	59.5	59.5	7.16	0.12	0
% Silt (0.063mm - 0.004mm)	2	26.1	28.0	27.1	27.1	1.34	0.05	0
% Clay (<4um)	2	6.91	12.7	9.81	9.81	4.09	0.42	0
Total Organic Carbon	**0**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**

NOTE:
n/a not available; TOC not analyzed in samples >1.5 m depth.

Table 6-17 Berth 2: Primarily Core - Small Summary Stats (0 - 0.2 m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	4	35.1	40.7	37.7	37.5	2.59	0.07	0
% Gravel (>2mm)	4	0.35	0.63	0.52	0.57	0.15	0.29	1
% Sand (2.00mm - 0.063mm)	4	3.11	31.0	15.0	13.0	14.1	0.94	0
% Silt (0.063mm - 0.004mm)	4	40.5	64.7	54.3	56.0	11.5	0.21	0
% Clay (<4um)	4	27.4	33.8	30.3	29.9	3.15	0.10	0
Total Organic Carbon	**4**	**1.41**	**2.25**	**1.70**	**1.57**	**0.39**	**0.23**	**0**

Table 6-18 Berth 2: Primarily Core - Small Summary Stats (0.2 - 0.4 m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	4	28.2	38.5	33.0	32.7	4.69	0.14	0
% Gravel (>2mm)	2	3.69	6.31	5.00	5.00	1.85	0.37	2
% Sand (2.00mm - 0.063mm)	4	2.33	55.9	26.6	24.0	27.3	1.03	0
% Silt (0.063mm - 0.004mm)	4	25.2	64.4	46.3	47.9	20.0	0.43	0
% Clay (<4um)	4	15.3	33.1	24.6	25.0	9.86	0.40	0
Total Organic Carbon	**4**	**0.91**	**1.28**	**1.12**	**1.15**	**0.15**	**0.14**	**0**

Table 6-19 Berth 2: Primarily Core - Small Summary Stats (0.4 - 0.6[a] m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	4	14.4	34.4	28.6	32.8	9.55	0.33	0
% Gravel (>2mm)	2	5.04	13.0	9.02	9.02	5.63	0.62	2
% Sand (2.00mm - 0.063mm)	4	2.63	75.3	30.2	21.5	34.3	1.13	0
% Silt (0.063mm - 0.004mm)	4	8.30	64.5	43.0	49.6	25.8	0.60	0
% Clay (<4um)	4	3.43	34.8	22.3	25.5	14.6	0.66	0
Total Organic Carbon	**4**	**0.42**	**1.34**	**1.03**	**1.18**	**0.41**	**0.40**	**0**

NOTE:

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

Table 6-20 Berth 2: Primarily Core - Small Summary Stats (0.6 - 0.8 m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	2	31.5	34.0	32.8	32.8	1.77	0.05	0
% Gravel (>2mm)	2	0.73	1.22	0.98	0.98	0.35	0.36	0
% Sand (2.00mm - 0.063mm)	2	4.52	15.5	10.0	10.0	7.76	0.78	0
% Silt (0.063mm - 0.004mm)	2	57.3	64.7	61.0	61.0	5.23	0.09	0
% Clay (<4um)	2	25.9	30.0	28.0	28.0	2.90	0.10	0
Total Organic Carbon	**2**	**1.01**	**1.10**	**1.06**	**1.06**	**0.06**	**0.06**	**0**

Table 6-21 Berth 2: Primarily Core - Small Summary Stats (0.8 - 1.0 m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	2	31.0	31.2	31.1	31.1	0.14	0.00	0
% Gravel (>2mm)	2	0.36	0.46	0.41	0.41	0.07	0.17	0
% Sand (2.00mm - 0.063mm)	2	19.6	26.5	23.0	23.0	4.85	0.21	0
% Silt (0.063mm - 0.004mm)	2	53.4	54.6	54.0	54.0	0.85	0.02	0
% Clay (<4um)	2	19.7	25.4	22.6	22.6	4.03	0.18	0
Total Organic Carbon	**2**	**0.99**	**1.05**	**1.02**	**1.02**	**0.04**	**0.04**	**0**

Table 6-22 MOF: Surface Samples Summary Stats

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	13	17.9	48.6	35.9	40.2	11.0	0.31	0
% Gravel (>2mm)	13	0.15	6.64	1.22	0.74	1.94	1.59	3
% Sand (2.00mm - 0.063mm)	13	22.5	95.4	52.3	42.9	26.7	0.51	0
% Silt (0.063mm - 0.004mm)	13	3.18	53.4	32.4	37.7	18.7	0.58	0
% Clay (<4um)	13	1.43	23.9	14.4	16.7	8.71	0.60	0
Total Organic Carbon	**13**	**0.48**	**4.11**	**1.62**	**1.41**	**1.02**	**0.63**	**0**

Table 6-23 MOF: Primarily Core - Large Summary Stats (0 - 0.5[a] m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	13	16.0	35.8	27.5	29.7	5.38	0.20	0
% Gravel (>2mm)	13	0.34	12.0	1.80	0.73	3.17	1.76	0
% Sand (2.00mm - 0.063mm)	13	31.9	82.1	59.7	62.2	15.4	0.26	0
% Silt (0.063mm - 0.004mm)	13	3.60	44.6	26.0	24.5	11.2	0.43	0
% Clay (<4um)	13	2.33	23.1	12.5	12.8	6.07	0.48	0
Total Organic Carbon	**13**	**0.63**	**1.68**	**1.08**	**1.04**	**0.31**	**0.28**	**0**

NOTE:

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

Table 6-24 MOF: Primarily Core - Large Summary Stats (0.5 - 1.0 m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	11	20.4	32.6	25.4	25.5	3.46	0.14	0
% Gravel (>2mm)	11	0.32	2.62	1.20	0.61	0.90	0.75	0
% Sand (2.00mm - 0.063mm)	11	34.3	85.3	63.5	64.3	15.0	0.24	0
% Silt (0.063mm - 0.004mm)	11	8.82	43.1	24.3	20.9	9.89	0.41	0
% Clay (<4um)	11	3.32	22.3	11.1	11.2	5.75	0.52	0
Total Organic Carbon	**11**	**0.62**	**1.40**	**0.93**	**0.95**	**0.24**	**0.26**	**0**

Table 6-25 MOF: Primarily Core - Large Summary Stats (1.0 - 1.5[a] m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	11	20.6	32.1	25.1	24.6	3.26	0.13	0
% Gravel (>2mm)	11	0.50	4.38	2.17	1.50	1.51	0.70	1
% Sand (2.00mm - 0.063mm)	11	43.0	82.3	70.4	74.5	11.4	0.16	0
% Silt (0.063mm - 0.004mm)	11	10.9	37.2	18.9	17.2	7.91	0.42	0
% Clay (<4um)	11	3.65	19.7	8.75	7.55	4.52	0.52	0
Total Organic Carbon	**11**	**0.32**	**1.16**	**0.69**	**0.68**	**0.28**	**0.40**	**0**

NOTE:

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

Table 6-26 MOF: Primarily Core - Large Summary Stats (1.5 - 2.0[a] m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	10	16.0	26.5	21.0	20.6	4.07	0.19	0
% Gravel (>2mm)	10	0.43	8.92	3.05	1.17	3.21	1.05	0
% Sand (2.00mm - 0.063mm)	10	36.4	81.8	68.3	73.5	13.7	0.20	0
% Silt (0.063mm - 0.004mm)	10	11.2	43.4	20.2	15.9	10.0	0.50	0
% Clay (<4um)	10	3.78	19.5	8.47	6.29	4.94	0.58	0
Total Organic Carbon	**0**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**

NOTES:

n/a not available; TOC not analyzed in samples >1.5 m depth.

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

Table 6-27 MOF: Primarily Core - Large Summary Stats (> 2.0a m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	6	13.0	38.2	23.1	22.4	8.98	0.39	0
% Gravel (>2mm)	6	0.19	13.6	3.26	1.22	5.17	1.58	0
% Sand (2.00mm - 0.063mm)	6	54.2	83.0	69.4	72.0	12.2	0.18	0
% Silt (0.063mm - 0.004mm)	6	9.94	37.1	20.4	18.5	9.63	0.47	0
% Clay (<4um)	6	4.20	11.9	6.94	6.11	2.72	0.39	0
Total Organic Carbon	**0**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**

NOTES:

n/a not available; TOC not analyzed in samples >1.5 m depth.

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

Table 6-28 MOF: Primarily Core - Small Summary Stats (0 - 0.2 m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	6	19.6	37.2	28.6	28.6	6.37	0.22	0
% Gravel (>2mm)	6	0.95	8.44	3.50	1.38	3.59	1.03	0
% Sand (2.00mm - 0.063mm)	6	36.1	74.0	61.6	67.3	14.9	0.24	0
% Silt (0.063mm - 0.004mm)	6	12.3	40.2	22.9	21.0	10.7	0.47	0
% Clay (<4um)	6	6.19	22.6	12.0	9.78	6.71	0.56	0
Total Organic Carbon	**6**	**0.29**	**1.63**	**0.91**	**0.91**	**0.47**	**0.51**	**0**

Table 6-29 MOF: Primarily Core - Small Summary Stats (0.2 - 0.4 m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	4	18.8	35.8	26.3	26.6	7.22	0.27	0
% Gravel (>2mm)	3	1.24	2.63	1.86	2.47	0.76	0.41	1
% Sand (2.00mm - 0.063mm)	4	22.2	75.2	53.2	58.3	22.6	0.42	0
% Silt (0.063mm - 0.004mm)	4	17.6	48.1	29.8	26.0	13.2	0.44	0
% Clay (<4um)	4	6.03	29.7	15.7	13.1	10.2	0.65	0
Total Organic Carbon	**4**	**0.58**	**1.73**	**1.12**	**0.98**	**0.48**	**0.43**	**0**

Table 6-30 MOF: Primarily Core - Small Summary Stats (0.4 - 0.6 m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	4	19.1	31.9	24.9	24.2	5.42	0.22	0
% Gravel (>2mm)	4	0.41	3.22	1.77	1.72	1.31	0.74	0
% Sand (2.00mm - 0.063mm)	4	35.2	75.0	57.5	59.9	17.1	0.30	0
% Silt (0.063mm - 0.004mm)	4	18.0	41.6	27.7	25.6	10.4	0.38	0
% Clay (<4um)	4	6.22	22.8	13.1	11.7	7.19	0.55	0
Total Organic Carbon	**4**	**0.62**	**1.19**	**0.88**	**0.85**	**0.24**	**0.27**	**0**

Table 6-31 MOF: Primarily Core - Small Summary Stats (0.6 - 0.8 m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	4	18.2	34.7	25.5	24.5	6.94	0.27	0
% Gravel (>2mm)	4	0.79	4.55	2.38	2.08	1.71	0.72	0
% Sand (2.00mm - 0.063mm)	4	35.7	78.0	61.1	65.4	18.2	0.30	0
% Silt (0.063mm - 0.004mm)	4	15.7	39.6	24.2	20.8	10.9	0.45	0
% Clay (<4um)	4	4.98	23.8	12.3	10.1	8.17	0.67	0
Total Organic Carbon	**4**	**0.53**	**1.41**	**0.97**	**0.96**	**0.36**	**0.37**	**0**

Table 6-32 MOF: Primarily Core - Small Summary Stats (0.8 - 1.0 m)

Parameter	n	Min	Max	Mean	Median	SD	%CV	n<DL
% Moisture	4	18.3	31.3	23.5	21.6	5.53	0.24	0
% Gravel (>2mm)	4	0.28	4.13	2.25	1.46	1.72	0.76	0
% Sand (2.00mm - 0.063mm)	4	42.4	81.8	68.1	73.9	17.5	0.26	0
% Silt (0.063mm - 0.004mm)	4	12.5	38.0	19.9	15.0	12.1	0.61	0
% Clay (<4um)	4	4.31	19.4	9.70	7.98	6.65	0.69	0
Total Organic Carbon	**4**	**0.60**	**1.29**	**0.85**	**0.75**	**0.30**	**0.36**	**0**

Table 6-33 Berth 1 Arsenic Mean Core Concentrations

Site ID	Mean As (mg/kg)
PCL01	3.92
PCL02	6.03
PCL03	8.74[a]
PCL04	7.29[a]
PCL05	7.33[a]
PCL06	11.1[a]
PCL07	9.63[a]
PCL08	8.56[a]
PCL09	8.74[a]
PCL10	6.10

NOTE:
[a] value exceeded CCME ISQG/Disposal at Sea criteria for arsenic (7.24 mg/kg)

Table 6-34 Berth 1 Copper Mean Core Concentrations

Site ID	Mean Cu (mg/kg)
PCL01	8.19
PCL02	16.3
PCL03	15.1
PCL04	18.3
PCL05	18.8[a]
PCL06	28.2[a]
PCL07	21.8[a]
PCL08	19.0[a]
PCL09	20.6[a]
PCL10	13.3

NOTE:
[a] value exceeded CCME ISQG/Disposal at Sea criteria for copper (18.7 mg/kg)

Table 6-35 Berth 2 Arsenic Mean Core Concentrations

Site ID	Mean As (mg/kg)
PCL11	8.05[a]
PCL12	11.7[a]
PCL13	7.13
PCL14	9.01[a]
PCL15	8.21[a]
PCL18	12.3[a]

NOTE:
[a] value exceeded CCME ISQG/Disposal at Sea criteria for arsenic (7.24 mg/kg)

Table 6-36 Berth 2 Copper Mean Core Concentrations

Site ID	Mean Cu (mg/kg)
PCL11	22.9[a]
PCL12	31.9[a]
PCL13	16.0
PCL14	23.4[a]
PCL15	21.7[a]
PCL18	23.2[a]

NOTE:
a value exceeded CCME ISQG/Disposal at Sea criteria for copper (18.7 mg/kg)

Table 6-37 MOF Arsenic Mean Core Concentrations

Site ID	Mean As (mg/kg)
PCL21	5.03
PCL22	2.00
PCL23	5.71
PCL24	7.37[a]
PCL25	8.67[a]
PCL26	6.40
PCL27	4.05
PCL28	5.31
PCL29	8.06[a]
PCL30	7.61[a]
PCL31	3.89
PCL32	6.96
PCL33	4.60

NOTE:
[a] value exceeded CCME ISQG/Disposal at Sea criteria for arsenic (7.24 mg/kg)

Table 6-38 MOF Copper Mean Core Concentrations

Site ID	Mean Cu (mg/kg)
PCL21	10.4
PCL22	3.54
PCL23	10.5
PCL24	15.0
PCL25	19.2[a]
PCL26	15.0
PCL27	10.3
PCL28	10.2
PCL29	16.7
PCL30	14.5
PCL31	8.67
PCL32	13.0
PCL33	12.4

NOTE:
[a] value exceeded CCME ISQG/Disposal at Sea criteria for copper (18.7 mg/kg)

Table 6-39 Berth 1: Total PAH Summary Statistics

Total Polycyclic Aromatic Hydrocarbons (PAHs)	n	Min	Max	Mean	Median	SD	No. < DL	No. > D@S Criteria	No. > CCME ISQG	No. >CCME PEL
Surface Grabs										
0-0.075 m	9	0.10	0.33	0.15	0.10	0.10	7	0	-	-
Primary Core - Large (0.5 m intervals)										
0-0.5 m	10	0.053	0.31	0.11	0.10	0.07	5	0	-	-
0.5-1.0 m	9	0.018	0.10	0.06	0.037	0.04	8	0	-	-
1.0-1.5[a] m	9	0.018	0.10	0.06	0.059	0.04	9	0	-	-

NOTES:

bold values = 1/2 detection limit

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

Table 6-40 Berth 2: Total PAH Summary Statistics

Total Polycyclic Aromatic Hydrocarbons (PAHs)	n	Min	Max	Mean	Median	SD	No. < DL	No. > D@S Criteria	No. > CCME ISQG	No. >CCME PEL
Surface Grabs										
0-0.075 m	6	0.089	0.132	0.10	0.10	0.01	4	0	-	-
Primary Core - Large (0.5 m intervals)										
0-0.5 m	6	0.018	0.134	0.09	0.10	0.02	4	0	-	-
0.5-1.0 m	4	0.018	0.10	0.04	0.018	0.04	4	0	-	-
1.0-1.5[a] m	4	0.018	0.10	0.05	0.018	0.04	4	0	-	-

NOTES:

bold values = 1/2 detection limit

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

Table 6-41 MOF: Total PAH Summary Statistics

Total Polycyclic Aromatic Hydrocarbons (PAHs)	n	Min	Max	Mean	Median	SD	No. < DL	No. > D@S Criteria	No. > CCME ISQG	No. >CCME PEL
Surface Grabs										
0-0.075 m	13	0.018	0.810	0.33	0.16	0.29	5	0	-	-
Primary Core - Large (0.5 m intervals)										
0-0.5[a] m	14	0.018	0.282	0.14	0.10	0.09	7	0	-	-
0.5-1.0 m	11	0.018	0.10	0.06	0.10	0.04	11	0	-	-
1.0-1.5[a] m	11	0.018	0.10	0.06	0.10	0.04	11	0	-	-

NOTES:

bold values = 1/2 detection limit

[a] Depth intervals at some sample sites are approximate due to sediment refusal during vibracore drilling. Detailed depth intervals by site are presented in Table 3-3, Appendix 3.

APPENDIX 7

Summary of Water Quality Analytical Results

Table 7-1

Location (Sample ID)				Berth 1 (WQ_BA)				Berth 2 (WQ_BB)				MOF (WQ_PM)										
Tide				Ebb		Flood		Ebb		Flood		Ebb		Flood								
Depth (m)		BC MOE Guidelines[b]		1	10	1	16	1	18	1	19	1	11	1	12							
Matrix	Unit	Long-term Average	Short-term Maximum	Seawater	Seawater	Seawater	Seawater	Seawater	Seawater	Seawater	Seawater	Seawater	Seawater	Seawater	Seawater	n	Min	Max	Mean	Median	SD	n<DL	n>BCMOE long-term WQG	n>BCMOE short-term WQG
Physical Tests																								
Conductivity	uS/cm			41400	44500	42500	45400	41900	46300	43600	44900	42500	43800	43700	44800	12	41400	46300	43775	43750	1486	0	-	-
Hardness (as $CaCO_3$)	mg/L			4840	5360	5090	5590	4980	5490	5110	5260	5010	5240	5120	5190	12	4840	5590	5190	5190	215	0	-	-
pH	pH		7.0-8.7	7.93	7.96	7.88	7.93	7.92	7.95	7.94	7.92	7.92	7.94	7.91	7.95	12	8	8	8	7.94	0	0	-	0
Salinity	psu			26.7	28.9	27.5	29.6	27.0	30.2	28.6	29.5	27.5	28.4	28.3	29.1	12	27	30	28	28.4	1	0	-	-
Total Suspended Solids	mg/L			**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	12	1	1	1	1.00	0	12	-	-
Anions and Nutrients																								
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L			112	117	113	119	114	125	120	122	117	120	123	123	12	112	125	119	123	4	0	-	-
Alkalinity, Carbonate (as $CaCO_3$)	mg/L			**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	12	1	1	1	1	0	12	-	-
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L			**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	12	1	1	1	1	0	12	-	-
Alkalinity, Total (as $CaCO_3$)	mg/L			112	117	113	119	114	125	120	122	117	120	123	123	12	112	125	119	123	4	0	-	-
Ammonia, Total (as N)	mg/L	0.10-47[a] (2.2)	0.67-312[a] (15)	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	12	0.0025	0.0025	0.0025	0.00	0	12	0	0
Bromide (Br)	mg/L			52.7	58.0	52.1	60.9	55.4	62.0	57.5	59.5	55.3	58.2	57.5	58.9	12	52	62	57	58.2	3	0	-	-
Chloride (Cl)	mg/L			15300	16600	16000	17300	15900	17800	16800	17300	16000	16700	16800	17100	12	15300	17800	16633	16800	716	0	-	-
Fluoride (F)	mg/L		1.5	1.03	1.09	1.02	1.27	1.08	1.21	1.12	1.23	1.07	1.01	1.12	1.12	12	1.01	1.27	1.11	1.12	0	0	-	0
Nitrate (as N)	mg/L	3.7		0.56	**0.25**	0.52	0.52	**0.25**	0.68	0.95	0.79	0.64	**0.25**	0.56	0.55	12	0.25	0.95	0.54	0.55	0	3	0	-
Nitrite (as N)	mg/L			**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	0.10	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	12	0.05	0.10	0.05	0.05	0	11	-	-
Total Nitrogen	mg/L			0.27	0.28	0.42	0.42	0.27	0.26	0.27	0.25	0.28	0.28	0.26	0.26	12	0.25	0.42	0.29	0.26	0	0	-	-
Phosphorus (P)-Total	mg/L			0.046	0.052	0.046	0.052	0.050	0.051	0.047	0.049	0.050	0.052	0.050	0.051	12	0.046	0.052	0.050	0.05	0	0	-	-
Sulfate (SO_4)	mg/L			2130	2320	2240	2420	2230	2480	2320	2400	2230	2330	2370	2410	12	2130	2480	2323	2370.00	101	0	-	-
Total Metals																								
Aluminum (Al)-Total	mg/L			0.0221	0.0203	0.0212	0.0177	0.0183	0.0144	0.0190	0.0174	0.0164	0.0183	0.0186	0.0259	12	0.0144	0.0259	0.0191	0.0186	0.0030	0	-	-
Antimony (Sb)-Total	mg/L			**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	12	0.00025	0.00025	0.00025	0.00025	0.00000	12	-	-
Arsenic (As)-Total	mg/L		0.0125	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	12	0.001	0.001	0.001	0.001	0.000	12	-	0
Barium (Ba)-Total	mg/L			0.0088	0.0079	0.0082	0.0073	0.0084	0.0071	0.0082	0.0072	0.0085	0.0077	0.0079	0.0076	12	0.0071	0.0088	0.0079	0.0077	0.0005	0	-	-
Beryllium (Be)-Total	mg/L	0.1[d]		**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	12	0.00025	0.00025	0.00025	0.00025	0.00000	12	0	-
Bismuth (Bi)-Total	mg/L			**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	12	0.00025	0.00025	0.00025	0.00025	0.00000	12	-	-
Boron (B)-Total	mg/L	1.2		3.59	4.19	3.88	4.14	3.84	4.15	3.36	3.50	3.87	3.97	4.01	3.95	12	3.36	4.19	3.87	3.97	0.26	0	12	-
Cadmium (Cd)-Total	mg/L		0.00012[d]	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	12	0.000025	0.000025	0.000025	0.000025	0.000000	12	-	0
Calcium (Ca)-Total	mg/L			319	346	327	359	326	364	337	347	326	338	340	341	12	319	364	339	340	14	0	-	-
Cesium (Cs)-Total	mg/L			**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	12	0.00025	0.00025	0.00025	0.00025	0.00000	12	-	-
Chromium (Cr)-Total	mg/L			**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	0.00062	**0.00025**	**0.00025**	**0.00025**	12	0.00025	0.00062	0.00028	0.00025	0.00011	11	-	-
Cobalt (Co)-Total	mg/L			**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	12	0.000025	0.000025	0.000025	0.000025	0.000000	12	-	-
Copper (Cu)-Total	mg/L	0.002	0.003	0.00096	**0.00025**	0.00339	0.00509	0.00138	0.00051	0.00125	0.00258	0.00057	0.00109	0.00089	0.00079	12	0.00025	0.00509	0.00156	0.00089	0.00143	1	1	0
Gallium (Ga)-Total	mg/L			**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	12	0.00025	0.00025	0.00025	0.00025	0.00000	12	-	-
Iron (Fe)-Total	mg/L			0.045	0.042	0.046	0.046	0.033	0.029	0.039	0.038	0.043	0.038	0.033	0.045	12	0.029	0.046	0.040	0.038	0.006	0	-	-
Lead (Pb)-Total	mg/L	0.002[c]	0.14	**0.00015**	**0.00015**	**0.00015**	**0.00015**	**0.00015**	**0.00015**	**0.00015**	**0.00015**	**0.00015**	**0.00015**	**0.00015**	**0.00015**	12	0.00015	0.00015	0.00015	0.00015	0.00000	12	0	0
Lithium (Li)-Total	mg/L			0.131	0.139	0.133	0.142	0.134	0.140	0.152	0.166	0.125	0.138	0.136	0.140	12	0.125	0.166	0.140	0.138	0.011	0	-	-
Magnesium (Mg)-Total	mg/L			983	1090	1040	1140	1010	1110	1040	1070	1020	1070	1040	1050	12	983	1140	1055	1050	44	0	-	-
Manganese (Mn)-Total	mg/L		0.1[d]	0.00290	0.00339	0.00311	0.00308	0.00287	0.00239	0.00261	0.00263	0.00371	0.00382	0.00391	0.00368	12	0.00239	0.00391	0.00318	0.00382	0.00052	0	-	0
Molybdenum (Mo)-Total	mg/L			0.0085	0.0091	0.0082	0.0092	0.0081	0.0093	0.0083	0.0086	0.0088	0.0087	0.0085	0.0089	12	0.0081	0.0093	0.0087	0.0087	0.0004	0	-	-
Nickel (Ni)-Total	mg/L	0.0083[d]		**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	12	0.00025	0.00025	0.00025	0.00025	0.00000	12	0	-

Table 7-1

Location (Sample ID)				Berth 1 (WQ_BA)				Berth 2 (WQ_BB)				MOF (WQ_PM)										
Tide				Ebb		Flood		Ebb		Flood		Ebb		Flood								
Depth (m)		BC MOE Guidelines[b]		1	10	1	16	1	18	1	19	1	11	1	12							
Matrix	Unit	Long-term Average	Short-term Maximum	Seawater	Seawater	Seawater	Seawater	Seawater	Seawater	Seawater	Seawater	Seawater	Seawater	Seawater	Seawater	n	Min	Max	Mean	Median	SD	n<DL	n>BCMOE long-term WQG	n>BCMOE short-term WQG
Phosphorus (P)-Total	mg/L			**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	12	0.5	0.5	0.5	0.5	0.0	12	-	-
Potassium (K)-Total	mg/L			294	325	307	342	306	339	314	322	305	320	314	319	12	294	342	317	319.00	14	0	-	-
Rhenium (Re)-Total	mg/L			**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	12	0.000025	0.000025	0.000025	0.000025	0.000000	12	-	-
Rubidium (Rb)-Total	mg/L			0.102	0.120	0.111	0.122	0.106	0.122	0.116	0.124	0.109	0.116	0.115	0.116	12	0.102	0.124	0.115	0.116	0.007	0	-	-
Selenium (Se)-Total	mg/L	0.002		**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	12	0.001	0.001	0.001	0.001	0.000	12	0	-
Silicon (Si)-Total	mg/L			1.04	0.97	1.00	0.96	0.97	0.89	0.93	1.01	0.96	0.96	0.97	0.88	12	0.88	1.04	0.96	0.96	0.05	0	-	-
Silver (Ag)-Total	mg/L	0.0015	0.003	**0.00005**	**0.00005**	**0.00005**	**0.00005**	**0.00005**	**0.00005**	**0.00005**	**0.00005**	**0.00005**	**0.00005**	**0.00005**	**0.00005**	12	0.00005	0.00005	0.00005	0.00005	0.00000	12	0	0
Sodium (Na)-Total	mg/L			8200	9000	8360	9290	8340	9200	9020	9250	8290	8630	9120	9190	12	8200	9290	8824	9120	426	0	-	-
Strontium (Sr)-Total	mg/L			5.77	6.35	5.91	6.55	5.90	6.48	6.20	6.31	5.88	6.09	6.21	6.30	12	6	7	6	6.21	0	0	-	-
Tellurium (Te)-Total	mg/L			**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	12	0.00025	0.00025	0.00025	0.00025	0.00000	12	-	-
Thallium (Tl)-Total	mg/L			**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	12	0.000025	0.000025	0.000025	0.000025	0.000000	12	-	-
Thorium (Th)-Total	mg/L			**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	12	0.00025	0.00025	0.00025	0.00025	0.00000	12	-	-
Tin (Sn)-Total	mg/L			**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	12	0.0005	0.0005	0.0005	0.0005	0.0000	12	-	-
Titanium (Ti)-Total	mg/L			**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	**0.0025**	12	0.0025	0.0025	0.0025	0.0025	0.0000	12	-	-
Tungsten (W)-Total	mg/L			**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	**0.0005**	12	0.0005	0.0005	0.0005	0.0005	0.0000	12	-	-
Uranium (U)-Total	mg/L			0.00234	0.00254	0.00245	0.00274	0.00229	0.00275	0.00233	0.00239	0.00247	0.00258	0.00247	0.00239	12	0.00229	0.00275	0.00248	0.00247	0.00015	0	-	-
Vanadium (V)-Total	mg/L	0.05[d]		0.00135	0.00144	0.00150	0.00155	0.00138	0.00160	0.00137	0.00137	0.00137	0.00145	0.00141	0.00149	12	0.00135	0.00160	0.00144	0.00145	0.00008	0	0	-
Yttrium (Y)-Total	mg/L			**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	12	0.00025	0.00025	0.00025	0.00025	0.00000	12	-	-
Zinc (Zn)-Total	mg/L	0.01	0.55	**0.0015**	**0.0015**	**0.0015**	**0.0015**	**0.0015**	**0.0015**	**0.0015**	**0.0015**	**0.0015**	**0.0015**	**0.0015**	**0.0015**	12	0.0015	0.0015	0.0015	0.0015	0.0000	12	0	0
Zirconium (Zr)-Total	mg/L			**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	**0.00025**	12	0.00025	0.00025	0.00025	0.00025	0.00000	12	-	-
Plant Pigments																								
Chlorophyll a	ug/L			0.053	0.095	0.134	0.064	0.061	**0.005**	**0.005**	**0.005**	0.123	**0.005**	**0.005**	**0.005**	12	0.005	0.134	0.047	0.005	0.049	6	-	-

Notes:

bold values = 1/2 detection limit

value exceeds BC MOE 30-day average guideline

value exceeds BC MOE maximum guideline

[a] The ammonia nitrogen guidelines are dependent upon salinity, temperature, and pH. For saltwater with salinity of 30 ppt, temperature of 10 C, and pH 8.0 (conditions which most conservatively represent the observations made during the December sampling program, for all sites), the maximum concentration of total ammonia nitrogen for protection of saltwater aquatic life is 15 mg/L, while the average 5-30 d concentration guideline is 2.2 mg/L.

[b] Approved Water Quality Guideline (BC MOE 2016)

[c] 80% of the values less than or equal to 0.002 mg/L Pb

[d] Working Water Quality Guideline (BC MOE 2015)

Table 4-2

Location (Sample ID)		Berth 1 (WQ_BA)				Berth 2 (WQ_BB)				MOF (WQ_PM)			
Matrix	**Unit**	min	max	mean	SD	min	max	mean	SD	min	max	mean	SD
Physical Tests													
Conductivity	uS/cm	41400	45400	43450	1827	41900	46300	44175	1875	42500	44800	43700	942
Hardness (as $CaCO_3$)	mg/L	4840	5590	5220	325	4980	5490	5210	219	5010	5240	5140	100
pH	pH	7.88	7.96	7.93	0.03	7.92	7.95	7.93	0.02	7.91	7.95	7.93	0.02
Salinity	psu	26.7	29.6	28.2	1.3	27.0	30.2	28.8	1.4	27.5	29.1	28.3	0.7
Total Suspended Solids	mg/L	**1**	**1**	***1***	***0.0***	**1**	**1**	***1***	***0.0***	**1**	**1**	***1***	***0.0***
Anions and Nutrients													
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	112	119	115	3	114	125	120	5	117	123	121	3
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	**1**	**1**	***1***	***0***	**1**	**1**	***1***	***0***	**1**	**1**	***1***	***0***
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	**1**	**1**	***1***	***0***	**1**	**1**	***1***	***0***	**1**	**1**	***1***	***0***
Alkalinity, Total (as $CaCO_3$)	mg/L	112	119	115	3	114	125	120	5	117	123	121	3
Ammonia, Total (as N)	mg/L	**0.0025**	**0.0025**	***0.0025***	***0.0000***	**0.0025**	**0.0025**	***0.0025***	***0.0000***	**0.0025**	**0.0025**	***0.0025***	***0.0000***
Bromide (Br)	mg/L	52.1	60.9	55.9	4.2	55.4	62.0	58.6	2.8	55.3	58.9	57.5	1.6
Chloride (Cl)	mg/L	15300	17300	16300	852	15900	17800	16950	810	16000	17100	16650	465
Fluoride (F)	mg/L	1.02	1.27	1.10	0.12	1.08	1.23	1.16	0.07	1.01	1.12	1.08	0.05
Nitrate (as N)	mg/L	**0.25**	0.56	***0.46***	***0.14***	**0.25**	0.95	***0.67***	***0.30***	**0.25**	0.64	***0.50***	***0.17***
Nitrite (as N)	mg/L	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	0.10	*0.06*	*0.03*	**0.05**	**0.05**	***0.05***	***0.00***
Total Nitrogen	mg/L	0.27	0.42	0.35	0.08	0.25	0.27	0.26	0.01	0.26	0.28	0.27	0.01
Phosphorus (P)-Total	mg/L	0.046	0.052	0.049	0.003	0.047	0.051	0.049	0.002	0.050	0.052	0.051	0.001
Sulfate (SO_4)	mg/L	2130	2420	2278	123	2230	2480	2358	107	2230	2410	2335	77
Total Metals													
Aluminum (Al)-Total	mg/L	0.0177	0.0221	0.0203	0.0019	0.0144	0.0190	0.0173	0.0020	0.0164	0.0259	0.0198	0.0042
Antimony (Sb)-Total	mg/L	**0.00025**	**0.00025**	***0.00025***	***0.00000***	**0.00025**	**0.00025**	***0.00025***	***0.00000***	**0.00025**	**0.00025**	***0.00025***	***0.00000***
Arsenic (As)-Total	mg/L	**0.001**	**0.001**	***0.001***	***0.000***	**0.001**	**0.001**	***0.001***	***0.000***	**0.001**	**0.001**	***0.001***	***0.000***
Barium (Ba)-Total	mg/L	0.0073	0.0088	0.0081	0.0006	0.0071	0.0084	0.0077	0.0007	0.0076	0.0085	0.0079	0.0004
Beryllium (Be)-Total	mg/L	**0.00025**	**0.00025**	***0.00025***	***0.00000***	**0.00025**	**0.00025**	***0.00025***	***0.00000***	**0.00025**	**0.00025**	***0.00025***	***0.00000***
Bismuth (Bi)-Total	mg/L	**0.00025**	**0.00025**	***0.00025***	***0.00000***	**0.00025**	**0.00025**	***0.00025***	***0.00000***	**0.00025**	**0.00025**	***0.00025***	***0.00000***
Boron (B)-Total	mg/L	3.59	4.19	3.95	0.28	3.36	4.15	3.71	0.35	3.87	4.01	3.95	0.06
Cadmium (Cd)-Total	mg/L	**0.000025**	**0.000025**	***0.000025***	***0.000000***	**0.000025**	**0.000025**	***0.000025***	***0.000000***	**0.000025**	**0.000025**	***0.000025***	***0.000000***
Calcium (Ca)-Total	mg/L	319	359	338	18	326	364	344	16	326	341	336	7
Cesium (Cs)-Total	mg/L	**0.00025**	**0.00025**	***0.00025***	***0.00000***	**0.00025**	**0.00025**	***0.00025***	***0.00000***	**0.00025**	**0.00025**	***0.00025***	***0.00000***
Chromium (Cr)-Total	mg/L	**0.00025**	**0.00025**	***0.00025***	***0.00000***	**0.00025**	**0.00025**	***0.00025***	***0.00000***	**0.00025**	0.00062	***0.00034***	***0.00019***
Cobalt (Co)-Total	mg/L	**0.000025**	**0.000025**	***0.000025***	***0.000000***	**0.000025**	**0.000025**	***0.000025***	***0.000000***	**0.000025**	**0.000025**	***0.000025***	***0.000000***
Copper (Cu)-Total	mg/L	**0.00025**	0.00509	***0.00242***	***0.00223***	0.00051	0.00258	0.00143	0.00086	0.00057	0.00109	0.00084	0.00022
Gallium (Ga)-Total	mg/L	**0.00025**	**0.00025**	***0.00025***	***0.00000***	**0.00025**	**0.00025**	***0.00025***	***0.00000***	**0.00025**	**0.00025**	***0.00025***	***0.00000***

Table 4-2

Location (Sample ID)		Berth 1 (WQ_BA)				Berth 2 (WQ_BB)				MOF (WQ_PM)			
Matrix	**Unit**	min	max	mean	SD	min	max	mean	SD	min	max	mean	SD
Iron (Fe)-Total	mg/L	0.042	0.046	0.045	0.002	0.029	0.039	0.035	0.005	0.033	0.045	0.040	0.005
Lead (Pb)-Total	mg/L	**0.00015**	**0.00015**	***0.00015***	***0.00000***	**0.00015**	**0.00015**	***0.00015***	***0.00000***	**0.00015**	**0.00015**	***0.00015***	***0.00000***
Lithium (Li)-Total	mg/L	0.131	0.142	0.136	0.005	0.134	0.166	0.148	0.014	0.125	0.140	0.135	0.007
Magnesium (Mg)-Total	mg/L	983	1140	1063	67	1010	1110	1058	43	1020	1070	1045	21
Manganese (Mn)-Total	mg/L	0.00290	0.00339	0.00312	0.00020	0.00239	0.00287	0.00263	0.00020	0.00368	0.00391	0.00378	0.00011
Molybdenum (Mo)-Total	mg/L	0.0082	0.0092	0.0088	0.0005	0.0081	0.0093	0.0086	0.0005	0.0085	0.0089	0.0087	0.0002
Nickel (Ni)-Total	mg/L	**0.00025**	**0.00025**	***0.00025***	***0.00000***	**0.00025**	**0.00025**	***0.00025***	***0.00000***	**0.00025**	**0.00025**	***0.00025***	***0.00000***
Phosphorus (P)-Total	mg/L	**0.5**	**0.5**	***0.5***	***0.0***	**0.5**	**0.5**	***0.5***	***0.0***	**0.5**	**0.5**	***0.5***	***0.0***
Potassium (K)-Total	mg/L	294	342	317	21	306	339	320	14	305	320	315	7
Rhenium (Re)-Total	mg/L	**0.000025**	**0.000025**	***0.000025***	***0.000000***	**0.000025**	**0.000025**	***0.000025***	***0.000000***	**0.000025**	**0.000025**	***0.000025***	***0.000000***
Rubidium (Rb)-Total	mg/L	0.102	0.122	0.114	0.009	0.106	0.124	0.117	0.008	0.109	0.116	0.114	0.003
Selenium (Se)-Total	mg/L	**0.001**	**0.001**	***0.001***	***0.000***	**0.001**	**0.001**	***0.001***	***0.000***	**0.001**	**0.001**	***0.001***	***0.000***
Silicon (Si)-Total	mg/L	0.96	1.04	0.99	0.04	0.89	1.01	0.95	0.05	0.88	0.97	0.94	0.04
Silver (Ag)-Total	mg/L	**0.00005**	**0.00005**	***0.00005***	***0.00000***	**0.00005**	**0.00005**	***0.00005***	***0.00000***	**0.00005**	**0.00005**	***0.00005***	***0.00000***
Sodium (Na)-Total	mg/L	8200	9290	8713	517	8340	9250	8953	420	8290	9190	8808	426
Strontium (Sr)-Total	mg/L	5.77	6.55	6.15	0.37	5.90	6.48	6.22	0.24	5.88	6.30	6.12	0.18
Tellurium (Te)-Total	mg/L	**0.00025**	**0.00025**	***0.00025***	***0.00000***	**0.00025**	**0.00025**	***0.00025***	***0.00000***	**0.00025**	**0.00025**	***0.00025***	***0.00000***
Thallium (Tl)-Total	mg/L	**0.000025**	**0.000025**	***0.000025***	***0.000000***	**0.000025**	**0.000025**	***0.000025***	***0.000000***	**0.000025**	**0.000025**	***0.000025***	***0.000000***
Thorium (Th)-Total	mg/L	**0.00025**	**0.00025**	***0.00025***	***0.00000***	**0.00025**	**0.00025**	***0.00025***	***0.00000***	**0.00025**	**0.00025**	***0.00025***	***0.00000***
Tin (Sn)-Total	mg/L	**0.0005**	**0.0005**	***0.0005***	***0.0000***	**0.0005**	**0.0005**	***0.0005***	***0.0000***	**0.0005**	**0.0005**	***0.0005***	***0.0000***
Titanium (Ti)-Total	mg/L	**0.0025**	**0.0025**	***0.0025***	***0.0000***	**0.0025**	**0.0025**	***0.0025***	***0.0000***	**0.0025**	**0.0025**	***0.0025***	***0.0000***
Tungsten (W)-Total	mg/L	**0.0005**	**0.0005**	***0.0005***	***0.0000***	**0.0005**	**0.0005**	***0.0005***	***0.0000***	**0.0005**	**0.0005**	***0.0005***	***0.0000***
Uranium (U)-Total	mg/L	0.00234	0.00274	0.00252	0.00017	0.00229	0.00275	0.00244	0.00021	0.00239	0.00258	0.00248	0.00008
Vanadium (V)-Total	mg/L	0.00135	0.00155	0.00146	0.00009	0.00137	0.00160	0.00143	0.00011	0.00137	0.00149	0.00143	0.00005
Yttrium (Y)-Total	mg/L	**0.00025**	**0.00025**	***0.00025***	***0.00000***	**0.00025**	**0.00025**	***0.00025***	***0.00000***	**0.00025**	**0.00025**	***0.00025***	***0.00000***
Zinc (Zn)-Total	mg/L	**0.0015**	**0.0015**	***0.0015***	***0.0000***	**0.0015**	**0.0015**	***0.0015***	***0.0000***	**0.0015**	**0.0015**	***0.0015***	***0.0000***
Zirconium (Zr)-Total	mg/L	**0.00025**	**0.00025**	***0.00025***	***0.00000***	**0.00025**	**0.00025**	***0.00025***	***0.00000***	**0.00025**	**0.00025**	***0.00025***	***0.00000***
Plant Pigments													
Chlorophyll a	ug/L	0.053	0.134	0.087	0.036	**0.005**	0.061	***0.019***	***0.028***	**0.005**	0.123	***0.035***	***0.059***

Notes:

Summary statistics for each dredge area are for all sample depths and tidal states.

bold values = 1/2 detection limit

bold italicized values = calculation includes a sample below detection limits

Table 7-3

Sample Site ID	Tide	Date	Time	Depth (m)	Salinity (ppt)	D.O. (mg/L)	Temperature (°C)	Conductivity (uS/cm)	TDS (g/L)	pH	Turbidity (NTU)	Secchi Depth (m)[a]
Berth 1												
WQ_BA	Ebb	16-Dec-14	14:08	0	26.78	13.42	7.4	28158	27.4490	7.90	-	3.4
WQ_BA	Ebb	16-Dec-14	14:08	1	27.23	9.92	7.5	28182	27.7970	7.90	0.69	
WQ_BA	Ebb	16-Dec-14	14:08	2	27.50	9.19	7.6	28832	28.0670	7.90	0.97	
WQ_BA	Ebb	16-Dec-14	14:08	3	27.69	9.16	7.7	29096	28.2360	7.90	1.01	
WQ_BA	Ebb	16-Dec-14	14:08	4	27.43	9.37	7.4	28604	28.0215	7.89	0.77	
WQ_BA	Ebb	16-Dec-14	14:08	5	27.40	7.60	7.5	28693	27.9825	7.91	1.18	
WQ_BA	Ebb	16-Dec-14	14:08	6	27.74	8.10	7.8	29190	28.2750	7.90	0.79	
WQ_BA	Ebb	16-Dec-14	14:08	7	28.20	9.42	8.0	29778	28.6910	7.89	0.88	
WQ_BA	Ebb	16-Dec-14	14:08	8	28.55	7.56	8.1	30232	29.0030	7.89	0.89	
WQ_BA	Ebb	16-Dec-14	14:08	9	29.05	8.23	8.5	30978	29.4385	7.88	1.03	
WQ_BA	Ebb	16-Dec-14	14:08	10	29.16	7.00	8.5	31143	29.5230	7.88	0.93	
WQ_BA	Flood	17-Dec-14	9:20	0	27.67	9.05	7.3	28799	28.2495	7.93	-	5.0
WQ_BA	Flood	17-Dec-14	9:20	1	27.76	9.01	7.4	29051	28.3400	7.93	0.99	
WQ_BA	Flood	17-Dec-14	9:20	2	27.84	8.88	7.5	29042	28.3725	7.93	0.78	
WQ_BA	Flood	17-Dec-14	9:20	3	27.87	8.87	7.5	29090	28.4115	7.92	0.99	
WQ_BA	Flood	17-Dec-14	9:20	4	27.81	9.67	7.5	29022	28.3725	7.88	1.01	
WQ_BA	Flood	17-Dec-14	9:20	5	-	-	-	-	-	-	-	
WQ_BA	Flood	17-Dec-14	9:20	6	28.20	9.09	7.9	29699	28.7040	7.89	0.87	
WQ_BA	Flood	17-Dec-14	9:20	7	-	-	-	-	-	-	-	
WQ_BA	Flood	17-Dec-14	9:20	8	28.71	7.86	8.2	30438	29.1785	7.9	0.77	
WQ_BA	Flood	17-Dec-14	9:20	9	-	-	-	-	-	-	-	
WQ_BA	Flood	17-Dec-14	9:20	10	29.47	7.67	8.6	31522	29.8155	7.89	0.72	
WQ_BA	Flood	17-Dec-14	9:20	11	-	-	-	-	-	-	-	
WQ_BA	Flood	17-Dec-14	9:20	12	29.67	7.41	8.7	31770	29.9910	7.89	0.71	
WQ_BA	Flood	17-Dec-14	9:20	13	-	-	-	-	-	-	-	
WQ_BA	Flood	17-Dec-14	9:20	14	29.78	7.45	8.7	31904	30.1145	7.9	0.71	
WQ_BA	Flood	17-Dec-14	9:20	15	-	-	-	-	-	-	-	
WQ_BA	Flood	17-Dec-14	9:20	16	30.18	7.06	8.7	32309	30.4785	7.9	0.68	
Berth 2												
WQ_BB	Ebb	17-Dec-14	10:37	0	28.16	8.70	7.7	29612	28.9675	7.93	-	6.3
WQ_BB	Ebb	17-Dec-14	10:37	1	28.56	8.48	8.0	30080	28.9965	7.92	0.70	
WQ_BB	Ebb	17-Dec-14	10:37	2	28.81	8.42	8.1	30552	29.2630	7.92	0.76	
WQ_BB	Ebb	17-Dec-14	10:37	3	29.02	8.30	8.3	30764	29.4190	7.92	0.82	
WQ_BB	Ebb	17-Dec-14	10:37	4	27.92	9.88	7.2	28989	28.5740	7.93	0.76	
WQ_BB	Ebb	17-Dec-14	10:37	5	28.50	7.82	7.9	29992	28.9835	7.92	0.68	
WQ_BB	Ebb	17-Dec-14	10:37	6	28.86	7.58	7.9	30388	29.3150	7.91	0.83	

Table 7-3

Sample Site ID	Tide	Date	Time	Depth (m)	Salinity (ppt)	D.O. (mg/L)	Temperature (°C)	Conductivity (uS/cm)	TDS (g/L)	pH	Turbidity (NTU)	Secchi Depth (m)[a]
WQ_BB	Ebb	17-Dec-14	10:37	7	29.07	7.45	8.3	30856	29.4710	7.91	1.07	
WQ_BB	Ebb	17-Dec-14	10:37	8	29.50	7.00	8.4	31395	29.9195	7.9	1.19	
WQ_BB	Ebb	17-Dec-14	10:37	9	29.72	7.66	8.6	31730	30.0300	7.91	1.19	
WQ_BB	Ebb	17-Dec-14	10:37	10	29.89	7.31	8.6	31869	30.1925	7.9	0.94	
WQ_BB	Ebb	17-Dec-14	10:37	11	29.97	7.82	8.8	32125	30.2575	7.9	1.19	
WQ_BB	Ebb	17-Dec-14	10:37	12	30.02	7.56	8.7	32065	30.3030	7.91	1.38	
WQ_BB	Ebb	17-Dec-14	10:37	13	30.32	7.34	8.8	32514	30.5825	7.91	1.01	
WQ_BB	Ebb	17-Dec-14	10:37	14	30.31	7.03	8.9	32554	30.5890	7.91	1.57	
WQ_BB	Ebb	17-Dec-14	10:37	15	30.40	7.82	9.0	32712	30.7060	7.91	1.29	
WQ_BB	Ebb	17-Dec-14	10:37	16	30.36	7.56	9.0	32662	30.6085	7.91	1.07	
WQ_BB	Ebb	17-Dec-14	10:37	17	30.41	6.92	8.9	32677	30.6735	7.91	1.13	
WQ_BB	Ebb	17-Dec-14	10:37	18	30.32	6.77	8.9	32458	30.4655	7.92	0.95	
WQ_BB	Flood	18-Dec-14	9:07	0	28.35	8.83	7.9	29869	28.8276	7.92	-	4.1
WQ_BB	Flood	18-Dec-14	9:07	1	28.45	9.02	7.9	29992	28.9510	7.92	0.95	
WQ_BB	Flood	18-Dec-14	9:07	2	28.52	9.02	7.9	30050	28.9900	7.92	1.05	
WQ_BB	Flood	18-Dec-14	9:07	3	28.53	9.03	7.9	30067	29.0225	7.92	-	
WQ_BB	Flood	18-Dec-14	9:07	4	28.12	8.00	7.8	29600	28.6455	7.86	0.87	
WQ_BB	Flood	18-Dec-14	9:07	5	-	-	-	-	-	-	-	
WQ_BB	Flood	18-Dec-14	9:07	6	28.20	8.26	7.9	29713	28.6975	7.88	0.87	
WQ_BB	Flood	18-Dec-14	9:07	7	-	-	-	-	-	-	-	
WQ_BB	Flood	18-Dec-14	9:07	8	28.20	8.20	7.8	29672	28.7040	7.89	0.71	
WQ_BB	Flood	18-Dec-14	9:07	9	-	-	-	-	-	-	-	
WQ_BB	Flood	18-Dec-14	9:07	10	28.26	8.27	7.9	29740	28.7430	7.90	1.31	
WQ_BB	Flood	18-Dec-14	9:07	11	-	-	-	-	-	-	-	
WQ_BB	Flood	18-Dec-14	9:07	12	28.21	8.15	7.8	29705	28.7430	7.90	0.70	
WQ_BB	Flood	18-Dec-14	9:07	13	-	-	-	-	-	-	-	
WQ_BB	Flood	18-Dec-14	9:07	14	28.32	7.55	7.9	29855	28.8340	7.91	1.13	
WQ_BB	Flood	18-Dec-14	9:07	15	-	-	-	-	-	-	-	
WQ_BB	Flood	18-Dec-14	9:07	16	29.20	7.73	8.3	30986	29.5815	7.90	0.98	
WQ_BB	Flood	18-Dec-14	9:07	17	-	-	-	-	-	-	-	
WQ_BB	Flood	18-Dec-14	9:07	18	-	-	-	-	-	-	-	
WQ_BB	Flood	18-Dec-14	9:07	19	28.35	8.06	7.9	29862	28.8600	7.92	0.77	
MOF												
WQ_PM	Ebb	17-Dec-14	13:35	0	27.74	8.93	7.3	28813	28.3010	7.92	-	6.3
WQ_PM	Ebb	17-Dec-14	13:35	1	27.81	8.73	7.4	29017	28.3660	7.92	1.21	
WQ_PM	Ebb	17-Dec-14	13:35	2	27.95	8.82	7.6	29267	28.5155	7.92	1.02	
WQ_PM	Ebb	17-Dec-14	13:35	3	28.19	8.57	7.8	29649	28.7300	7.91	1.02	

Table 7-3

Sample Site ID	Tide	Date	Time	Depth (m)	Salinity (ppt)	D.O. (mg/L)	Temperature (°C)	Conductivity (uS/cm)	TDS (g/L)	pH	Turbidity (NTU)	Secchi Depth (m)[a]
WQ_PM	Ebb	17-Dec-14	13:35	4	28.13	8.80	7.4	29334	28.6976	7.92	1.06	
WQ_PM	Ebb	17-Dec-14	13:35	5	28.06	8.29	7.7	29437	28.5740	7.91	0.87	
WQ_PM	Ebb	17-Dec-14	13:35	6	28.20	8.18	7.8	29669	28.6975	7.91	1.36	
WQ_PM	Ebb	17-Dec-14	13:35	7	28.21	7.57	7.9	29719	28.7105	7.91	1.3	
WQ_PM	Ebb	17-Dec-14	13:35	8	28.44	7.59	8.0	30071	28.9120	7.91	1.59	
WQ_PM	Ebb	17-Dec-14	13:35	9	28.71	7.20	8.2	30454	29.1525	7.91	1.24	
WQ_PM	Ebb	17-Dec-14	13:35	10	28.84	7.16	8.4	30718	29.2500	7.9	1.17	
WQ_PM	Ebb	17-Dec-14	13:35	11	28.89	7.49	8.3	30709	29.3540	7.91	1.27	
WQ_PM	Flood	19-Dec-14	9:40	0	28.78	8.73	7.9	30265	29.2562	7.9	-	4.9
WQ_PM	Flood	19-Dec-14	9:40	1	28.89	8.58	7.9	30382	29.3345	7.9	0.47	
WQ_PM	Flood	19-Dec-14	9:40	2	28.96	8.68	7.9	30457	29.3800	7.9	0.69	
WQ_PM	Flood	19-Dec-14	9:40	3	29.04	8.35	8.0	30549	29.4515	7.9	0.53	
WQ_PM	Flood	19-Dec-14	9:40	4	28.62	7.80	7.7	30014	29.1395	7.9	0.78	
WQ_PM	Flood	19-Dec-14	9:40	5	28.72	7.45	7.8	30168	29.1915	7.9	0.86	
WQ_PM	Flood	19-Dec-14	9:40	6	28.82	8.08	8.0	30380	29.2695	7.9	0.86	
WQ_PM	Flood	19-Dec-14	9:40	7	28.92	8.06	7.9	30419	29.3800	7.9	0.64	
WQ_PM	Flood	19-Dec-14	9:40	8	29.08	7.86	8.1	30714	29.4905	7.9	0.83	
WQ_PM	Flood	19-Dec-14	9:40	9	29.08	7.70	8.2	30764	29.4840	7.9	0.76	
WQ_PM	Flood	19-Dec-14	9:40	10	29.32	7.86	8.3	31079	29.6920	7.9	0.51	
WQ_PM	Flood	19-Dec-14	9:40	11	29.43	7.84	8.4	31278	29.7895	7.9	1.02	
WQ_PM	Flood	19-Dec-14	9:40	12	29.08	7.75	8.0	30770	29.5555	7.89	1.05	

Notes:

[a] reported secchi depth is an average of 6 measurements, taken on the shady side of the vessel

[b] reading taken at 2.5 m, to correspond with sampling depth

Table 7-4

		Boron (mg/L)																				Boron Summary Stats (mg/L)							
		2013								2014								2015								n		min		max		mean	
		Q1 (April)		Q2 (May)		Q3 (July)		Q4 (November)		Q1 (April)		Q2 (June)		Q3 (August)		Q4 (November)		Q1 (March)		Q2 (May)		Q3 (August)		Q4 (October)									
Site ID	Location	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth
7	Fairview Terminal	3.5	3.59	3.55	3.54	3.99	4.05	4.22	4.34	3.86	-	3.09	4.3	3.51	3.94	3.66	-	3.89	-	3.25	3.86	3.68	3.86	3.15	-	12	8	3.09	3.54	4.22	4.34	3.61	3.94
8	Harbour Entrance	3.36	3.75	3.31	3.81	3.93	3.88	3.93	4.07	3.76	-	2.10	3.08	3.46	3.87	3.49	-	3.88	-	2.99	3.5	3.73	4.28	2.85	-	12	8	2.10	3.08	3.93	4.28	3.40	3.78
9	North Ridley	3.41	3.59	3.30	3.36	3.63	4.04	3.9	3.97	3.87	-	3.06	4.51	3.21	3.76	3.48	-	3.84	-	2.74	3.83	3.84	4.27	2.84	-	12	8	2.74	3.36	3.90	4.51	3.43	3.92
29	Philips Point	-	-	-	-	-	-	-	-	-	-	3.14	4.52	-	-	-	-	-	-	-	-	-	-	-	-	1	1	3.14	4.52	3.14	4.52	3.14	4.52
31	Tuck Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.93	-	2.99	3.5	3.9	4.16	3.08	-	4	2	2.99	3.5	3.93	4.16	3.48	3.83
32	Casey Cove	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.96	-	2.96	3.38	3.73	4.08	3.09	-	4	2	2.96	3.38	3.96	4.08	3.44	3.73

Notes:

Surface samples collected at 1 m and depth samples collected at 9 m.

Table 7-5

		TSS (mg/L)																					
		2013								2014								2015							
		Q1 (April)		Q2 (May)		Q3 (July)		Q4 (November)		Q1 (April)		Q2 (June)		Q3 (August)		Q4 (November)		Q1 (March)		Q2 (May)		Q3 (August)		Q4 (October)	
Site ID	Location	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth
7	Fairview Terminal	<2.0	<2.0	2.6	2.2	5.4	4.1	<2.0	<2.0	<2.0	-	2.4	<2.0	2.7	<2.0	2.3	-	29.5	-	4.5	3.6	2.9	< 2	< 2	-
8	Harbour Entrance	<2.0	<2.0	3.4	2.2	<2.0	2.1	<2.0	<2.0	2.6	-	2.8	2.7	3.0	<2.0	<2.0	-	28	-	4.3	4.1	2.8	< 2	4.3	-
9	North Ridley	<2.0	2.4	3.2	2.4	2.7	3.9	2.3	<2.0	2.1	-	3.5	<2.0	2.3	<2.0	2.5	-	34.2	-	9.8	3.7	2	2.4	2.7	-
29	Philips Point	-	-	-	-	-	-	-	-	-	-	<2.0	2.1	-	-	-	-	-	-						-
31	Tuck Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16.1	-	5.5	4.1	< 2	< 2	< 2	-
32	Casey Cove	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.9	-	6.1	4.1	< 2	< 2	< 2	-

Notes:

Surface samples collected at 1 m and depth samples collected at 9 m.

Site 29 was added to the water quality monitoring program in May 2014 but was not sampled in subsequent dates.

Table 7-6

		Turbidity (NTU)																					
		2013								2014								2015							
		Q1 (April)		Q2 (May)		Q3 (July)		Q4 (November)		Q1 (April)		Q2 (June)		Q3 (August)		Q4 (November)		Q1 (March)		Q2 (May)		Q3 (August)		Q4 (October)	
Site ID	Location	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth	Surface	Depth
7	Fairview Terminal	0.65	0.73	0.85	1.12	1.49	1.06	1.22	1.31	0.64	-	1.46	0.44	1.24	0.93	1.63	-	0.28	-	0.97	0.88	0.53	0.46	1.3	-
8	Harbour Entrance	0.71	1.05	1.36	1.2	0.51	0.72	0.92	1.02	0.56	-	1.59	1.3	0.75	0.61	1.62	-	0.34	-	1.31	1.12	0.99	0.98	1.55	-
9	North Ridley	1.09	1.0	1.39	1.27	0.97	1.06	2.04	1.09	0.75	-	1.72	0.51	0.95	0.97	1.54	-	0.5	-	3.17	1.23	1.25	1.11	2.54	-
29	Philips Point	-	-	-	-	-	-	-	-	-	-	1.00	0.72	-	-	-	-	-	-	-	-	-	-	-	-
31	Tuck Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.36	-	1.68	1.36	1.09	1.11	1.63	-
32	Casey Cove	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.34	-	1.33	0.84	0.62	0.57	1.2	-

Notes:

Surface samples collected at 1 m and depth samples collected at 9 m.

Site 29 was added to the water quality monitoring program in May 2014 but was not sampled in subsequent dates.

APPENDIX 8

Geotechnical Marine Borehole Sediment Data

8.1 Introduction

Geotechnical marine borehole samples were collected in the study area in May 2016 (Figures 8-1 and 8-2). Ten boreholes were drilled in the berth and MOF areas, typically to a depth of 30 m below mudline in the MOF and 17 m below mudline in the berth areas. The borehole sediment was separated into samples across discreet depth intervals (dependent on sediment strata) and archived following completion of the geotechnical program. Several samples from the marine boreholes were subsequently analyzed for metals and particle size distribution to supplement the shallower marine sediment quality investigation.

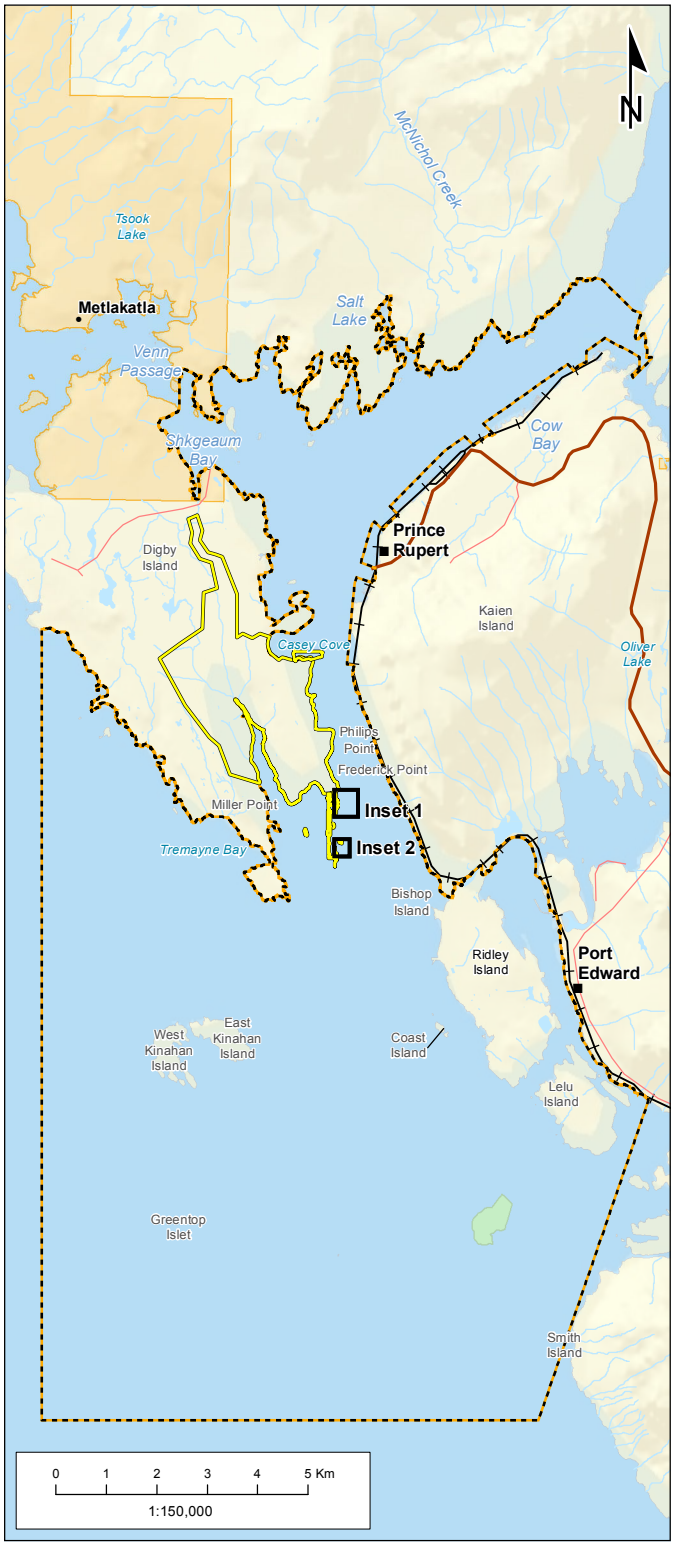
8.2 Methods

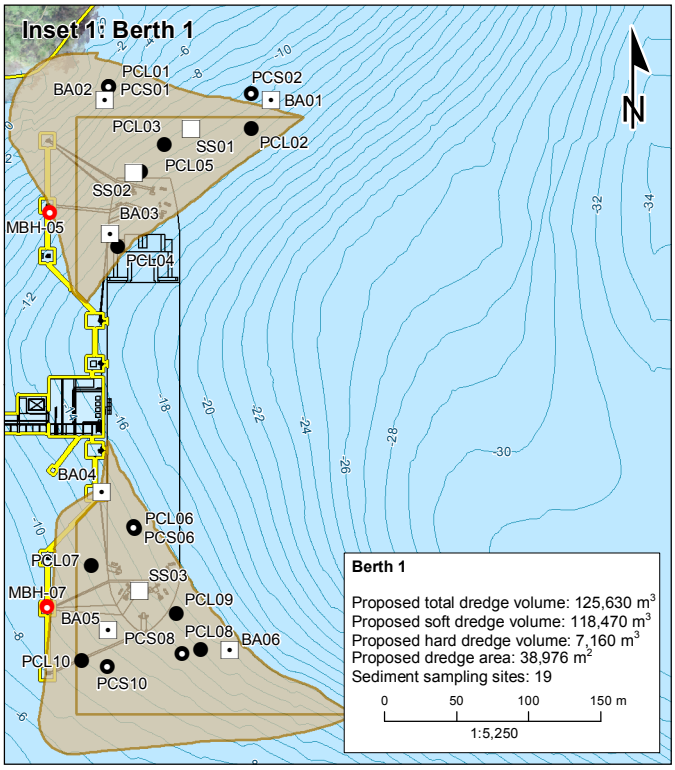
The borehole samples chosen to supplement the sediment quality assessment were selected based on remaining sediment volume and sampling depth. There were two criteria for sample selection: sufficient sediment remaining in the archived borehole sample; and collection from between 2.5 m below mudline to -15 m chart datum (within the expected maximum dredge depth). Six marine boreholes from within the study area contained samples that met these criteria, with two in Berth 1, four in the MOF, and none in Berth 2. From the six marine boreholes, ten samples were selected from appropriate depths for analysis of particle size, of which five were also analyzed for metals (Table 8-1).

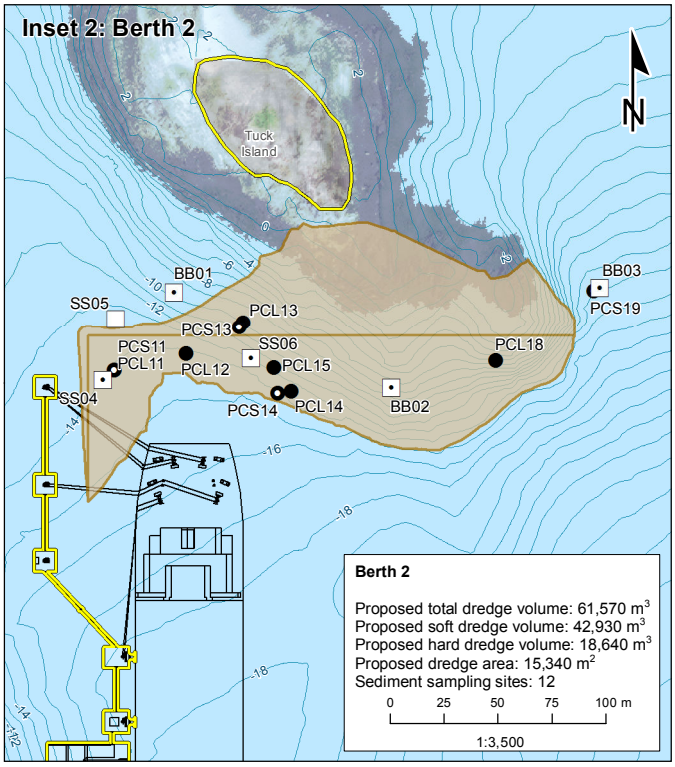
The majority of geotechnical marine borehole samples were collected using a wash rotary drilling technique with a spilt spoon sampler (samples labeled “SS”). At desired depths, the drill bit was removed so that a sample could be retrieved. One sample was a grab sample (sample labeled “GS”) and was collected from a retrieved core from a wash rotary coring technique. Sample locations and depth intervals are presented in Table 8-1.

Table 8-1 Geotechnical Marine Borehole Locations and Sample Depths

Area	Sample ID	Location		Drilling Depth	
		Northing	Easting	Top of Sample Interval (m below mudline)	Sample Recovery (m)
Berth 1	MBH-05 SS3	6012623	411121	3.20	0.28
	MBH-07 SS2A	6012348	411119	3.05	0.08
	MBH-07 SS3			4.57	0.28
MOF	MBH-14 SS3	6015492	410323	3.15	0.36
	MBH-14 SS4			3.76	0.18
	MBH-14 GS5			5.18	0.10
	MBH-15 SS4	6015505	410481	1.98	0.61
	MBH-16 SS3	6015496	410641	3.05	0.36
	MBH-16 SS4			6.10	0.36
	MBH-13 SS4	6015650	410305	3.05	0.51







- City, Municipality, or
- Community, Locality, or Village
- Highway
- Road
- Railway
- Watercourse
- Bathymetric Contour
- Park, Protected Area, Ecological Reserve, or Conservancy
- First Nation Reserve
- Waterbody
- Prince Rupert Port Authority Boundary
- Project Component
- Project Development Area
- Dredge Area
- Geotechnical Marine Borehole Location*

Sediment Cores
- Vibracore - Primary Core Large (PCL; 0.5m) Interval Core Sample Site
- Vibracore - Primary Core Small (PCS; 0.2m) Interval Core Sample Site (Analysis Includes Dioxins and Furans)*

Surface Sediment Samples
- Surface Grab (Analysis Includes Dioxins and Furans)
- Surface Grab

***Note:** Not included in sediment sample sites count.

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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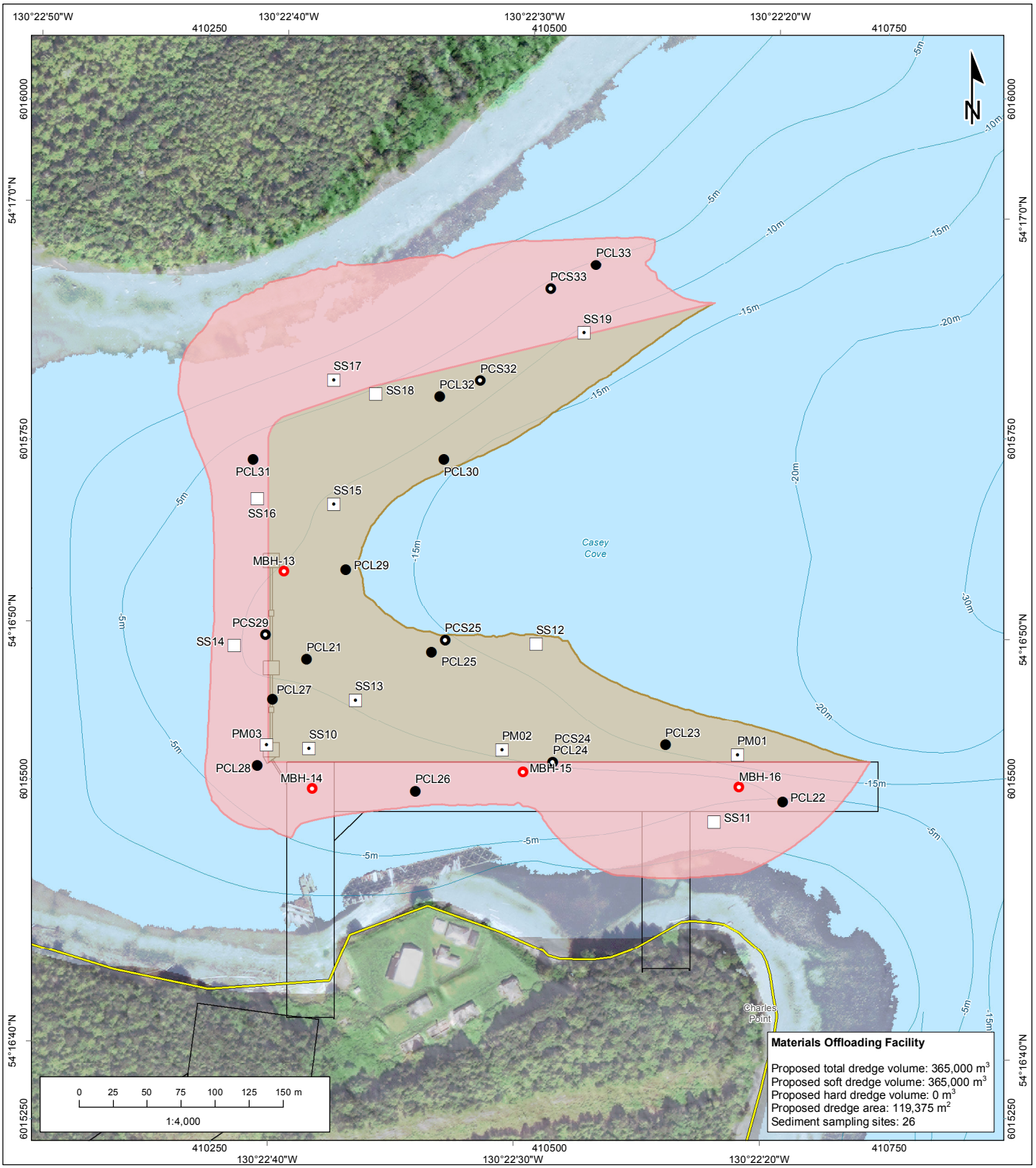
MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

BERTH AREAS DETAILED SEDIMENT QUALITY INVESTIGATION WITH GEOTECHNICAL MARINE BOREHOLES

Projection: UTM Zone 9 Datum: NAD 83	Fig. ID: 123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SD	FIGURE NO: **8-1**



Bathymetric Contour
Waterbody
Project Component
Terrestrial Portion of the Project Development Area

Proposed Dredge Area Footprint
Dredge Basin (-15m CD)
Dredge Side Slope (5H:1V)
Geotechnical Marine Borehole Location

Sediment Cores
Vibracore - Primary Core Large (PCL; 0.5m) Interval Core Sample Site
Vibracore - Primary Core Small (PCS; 0.2m) Interval Core Sample Site (Analysis Includes Dioxins and Furans)*

Surface Sediment Samples
Surface Grab (Analysis Includes Dioxins and Furans)
Surface Grab

***Note:** Not included in sediment sample sites count.

Data Sources: Government of British Columbia: DataBC, Terrain Resource Information Management, National Topographic System, BC Stats, BC Oil & Gas Commission. Government of Canada: CanVec v12, National Hydrology Network, Atlas of Canada National Framework, Fisheries and Oceans Canada, Environment Canada, Natural Resources Canada. INPEX Gas British Columbia Ltd. Nexen Energy ULC.

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COMMUNITY COMMITMENT CONNECTION

MARINE SEDIMENT AND WATER QUALITY TECHNICAL DATA REPORT

MATERIALS OFFLOADING FACILITY AREA DETAILED SEDIMENT QUALITY INVESTIGATION WITH GEOTECHNICAL MARINE BOREHOLES

Projection:UTM Zone 9 Datum: NAD 83	Fig. ID:123220054 Date: Oct 26, 2016	Drawn By: RC Checked By: SD	FIGURE NO: **8-2**

Marine borehole samples were sub-sampled in the same way as the surface grab and vibracore samples collected for the sediment characterization program (see Section 4.1 of the Marine Sediment and Water Quality TDR). In short, sediment samples were homogenized by hand in a clean stainless steel bowl and placed into pre-cleaned 120 mL glass jars provided by the laboratory (ALS Environmental (ALS) Laboratory). Samples were sent immediately for laboratory analysis of particle size and total metals.

8.3 Results

A complete laboratory report is included at the end of this Appendix.

8.3.1 Particle Size Distribution

Particle size analysis for marine borehole sub-samples is presented in Table 8-2.

Table 8-2 Particle Size Distributions for Marine Borehole Sediment Samples

Area	Sample ID	Depth (m below mudline)*	Composition (%)			
			Gravel	Sand	Silt	Clay
Berth 1	MBH-05 SS3	3.20	5.6	87.7	5.7	1.2
Berth 1	MBH-07 SS2A	3.05	1.6	41.2	33.9	23.3
	MBH-07 SS3	4.57	7.8	69.8	18.7	3.7
MOF	MBH-14 SS3	3.15	2.3	36.7	49.0	12.1
	MBH-14 SS4	3.76	1.6	21.7	50.4	26.4
	MBH-14 GS5	5.18	3.6	28.2	44.0	24.2
MOF	MBH-15 SS4	1.98	4.8	53.4	34.8	7.0
MOF	MBH-16 SS3	3.05	3.0	26.5	46.4	24.3
	MBH-16 SS4	6.10	3.5	37.7	43.1	15.5
MOF	MBH-13 SS4	3.05	<1.0	24.5	54.8	19.8

NOTE:
* = values represent top of sample interval

The three sediment samples from Berth 1 (Table 8-2) were from 3.2 to 4.57 m below mudline. All three samples were predominantly sand (41.2 to 87.7%). Sediment quality investigation at shallower depths in Berth 1 (see Section 5.2.1, Marine Sediment and Water Quality TDR, Appendix 6) revealed similar particle size distribution to deeper borehole samples. Samples from 0-0.5 m were predominantly sand (47.3%) and silt (33.2%) with a higher percentage of sand in deeper (0.2 to 1.5 m) sediments (54.2 to 62.9%).

The seven sediment samples from the MOF (Table 8-2) were from 1.98 to 6.1 m below mudline. The shallowest sample (MBH-15 SS4, 1.98 m) was mostly sand (53%), followed by silt with some clay and gravel. Four samples were collected from 3.05 to 3.76 m below mudline (MBH-13 SS4, MBH-16 SS3, MBH-14 SS3 and MBH-14 SS4). These four samples contained predominantly silt (46.4 to 54.8%), followed by sand (21.7 to 36.7%), clay (12.1 to 26.4%), and gravel (<1 to 3%). The two deepest samples (MBH-14 GS5, 5.18 m; MBH-16 SS4, 6.1 m) were also predominantly silt followed by sand, clay, and gravel (Table 8-2). The deeper borehole samples in the MOF contained higher levels of silt (34.8 to 54.8%) than the shallower

samples previously collected in the MOF (18.9 to 26%) (see Section 5.2.3, Marine Sediment and Water Quality TDR). Similar to Berth 1, the shallowest depth intervals in the MOF (0 to 0.5 m) were composed primarily of sand and silt with higher percentages of sand in deeper samples (0.2 to 2.5 m).

8.3.2 Metals

Five sediment samples were analyzed for metals, including those relevant to disposal at sea permitting (arsenic, cadmium, chromium, copper, lead, mercury, and zinc). Data were compared to the marine sediment screening criteria listed in Table 8-3 and in Table 4 (see Section 4.3 of the Marine Sediment and Water Quality TDR). Detailed sample results are presented in Table 8-3.

Table 8-3 Metal Concentrations for Marine Borehole Sediment Samples

Parameter	Guidelines			Concentration (mg/kg)				
	Disposal at Sea Screening Criterion	CCME ISQG/BC Lower SWQG*	CCME PEL/BC Upper SWQG*	MBH-05 SS3	MBH-07 SS3	MBH-14 GS5	MBH-16 SS4	MBH-13 SS4
Arsenic	7.24	7.24	41.6	1.19	2.3	2.98	2.28	4.41
Cadmium	0.6	0.7	4.2	0.073	0.161	0.447	**0.55****	0.225
Chromium	52.3	52.3	160	11	15.2	40.6	40.8	24.1
Copper	18.7	18.7	108	9.99	16.4	***46.8***	***44.3***	***29.5***
Lead	30.2	30.2	112	1.14	1.67	3.79	3.1	2.8
Mercury	0.75	0.13	0.7	0.0056	0.0081	0.016	0.0093	0.0118
Nickel	N/A	30*	50*	6.64	10.5	27.3	23.7	17.8
Zinc	124	124	271	22.9	34.1	92.4	84.4	58.1

NOTES:

* = value is BC lower/upper SWQG only

**: A cadmium value of 0.649 mg/kg was measured in this sample. The sample was re-analysed and a value of 0.450 mg/kg was recorded. The difference in results is likely due to sample heterogeneity and the mean of the two results is presented here because it is considered the most representative result.

bold = value exceeds Disposal at Sea criteria

***bold italicized* =** value exceeds Disposal at Sea screening criteria and CCME ISQG

The two samples collected from Berth 1 (MBH-05 and MBH-07) and analyzed for metals showed no exceedances of marine sediment screening criteria. The three samples collected from the MOF and analyzed for metals had a guideline exceedance for one or two metals. All three samples collected from the MOF (ranging in depth from 3.56 to 6.46 m below mudline) exceeded the disposal at sea criterion and CCME ISQG for copper (18.7 mg/kg), with a range of 29.5 to 46.8 mg/kg. At shallower depths (0–2.5 m) exceedances of the disposal at sea criterion and CCME ISQG for copper were observed in 26% of samples at the MOF (see Section 5.3.3.2, Marine Sediment and Water Quality TDR).

8.4 Summary

Geotechnical marine boreholes were collected at or near the proposed dredge footprint in May 2016. Six of the boreholes had remaining archived sediments and were of appropriate depths, with a total of ten

samples analyzed for particle size distribution, five of which were also analyzed for metals. Three samples were from boreholes drilled at Berth 1 and seven were from the MOF.

Three Berth 1 samples from 3.05 to 4.57 m below mudline were predominantly sand. MOF samples ranged in depths from 1.98 to 6.1 m below mudline; the shallowest sample was mostly sand, while the deeper samples (3.05 to 6.1 m below mudline) were predominantly silt with some sand.

None of the samples from Berth 1 had marine sediment screening criteria exceedances for the metals analyzed. In the MOF, copper exceeded the disposal at sea criterion and CCME ISQG in three samples. No samples exceeded CCME PELs for any of the analyzed metals.

STANTEC CONSULTING LTD.
ATTN: Barrie Tuite
500 - 4730 Kingsway
Burnaby BC V5H 0C6

Date Received: 06-OCT-16
Report Date: 07-NOV-16 15:29 (MT)
Version: FINAL REV. 2

Client Phone: 604-436-3014

Certificate of Analysis

Lab Work Order #: L1840266

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers: 15-59382
Legal Site Desc:

Comments: 7-NOV-2016 This report replaces the previous version and contains additional analyses, as requested.

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1840266-1	L1840266-2	L1840266-3	L1840266-4	L1840266-5
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	06-OCT-16	06-OCT-16	06-OCT-16	06-OCT-16	06-OCT-16
	Sampled Time	11:24	11:30	11:35	11:46	12:14
	Client ID	MBH-05 SS3	MBH-07 SS2A	MBH-07 SS3	MBH-14 SS3	MBH-14 SS4
Grouping	**Analyte**					
SOIL						
Particle Size	% Gravel (>2mm) (%)	5.6	1.6	7.8	2.3	1.6
	% Sand (2.00mm - 1.00mm) (%)	5.4	1.6	5.7	3.6	2.6
	% Sand (1.00mm - 0.50mm) (%)	9.0	2.7	5.1	4.2	3.3
	% Sand (0.50mm - 0.25mm) (%)	44.3	12.2	10.1	5.8	3.7
	% Sand (0.25mm - 0.125mm) (%)	23.5	16.9	18.4	11.1	5.4
	% Sand (0.125mm - 0.063mm) (%)	5.5	7.8	30.5	12.0	6.7
	% Silt (0.063mm - 0.0312mm) (%)	3.2	11.8	10.2	20.8	15.2
	% Silt (0.0312mm - 0.004mm) (%)	2.5	22.1	8.5	28.2	35.2
	% Clay (<4um) (%)	1.2	23.3	3.7	12.1	26.4
	Texture	Sand	Loam	Loamy sand	Silt loam	Silt loam
Metals	Arsenic (As) (mg/kg)	1.19		2.30		
	Cadmium (Cd) (mg/kg)	0.073		0.161		
	Chromium (Cr) (mg/kg)	11.0		15.2		
	Copper (Cu) (mg/kg)	9.99		16.4		
	Lead (Pb) (mg/kg)	1.14		1.67		
	Mercury (Hg) (mg/kg)	0.0056		0.0081		
	Nickel (Ni) (mg/kg)	6.64		10.5		
	Zinc (Zn) (mg/kg)	22.9		34.1		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1840266-6	L1840266-7	L1840266-8	L1840266-9	L1840266-10
	Description	Sediment	Sediment	Sediment	Sediment	Sediment
	Sampled Date	06-OCT-16	06-OCT-16	06-OCT-16	06-OCT-16	06-OCT-16
	Sampled Time	12:18	12:26	12:31	12:35	12:59
	Client ID	MBH-14 GS5	MBH-15 SS4	MBH-16 SS3	MBH-16 SS4	MBH-13 SS4
Grouping	**Analyte**					
SOIL						
Particle Size	% Gravel (>2mm) (%)	3.6	4.8	3.0	3.5	<1.0
	% Sand (2.00mm - 1.00mm) (%)	3.8	6.9	3.1	4.8	<1.0
	% Sand (1.00mm - 0.50mm) (%)	4.6	5.8	3.9	5.9	1.0
	% Sand (0.50mm - 0.25mm) (%)	5.1	7.5	4.6	6.9	1.1
	% Sand (0.25mm - 0.125mm) (%)	7.1	20.3	6.7	9.6	2.6
	% Sand (0.125mm - 0.063mm) (%)	7.6	12.9	8.2	10.5	19.8
	% Silt (0.063mm - 0.0312mm) (%)	17.1	15.6	17.9	18.3	22.6
	% Silt (0.0312mm - 0.004mm) (%)	26.9	19.2	28.5	24.8	32.2
	% Clay (<4um) (%)	24.2	7.0	24.3	15.5	19.8
	Texture	Loam	Sandy loam	Silt loam / Loam	Loam	Silt loam
Metals	Arsenic (As) (mg/kg)	2.98			2.28	4.41
	Cadmium (Cd) (mg/kg)	0.447			0.649	0.225
	Chromium (Cr) (mg/kg)	40.6			40.8	24.1
	Copper (Cu) (mg/kg)	46.8			44.3	29.5
	Lead (Pb) (mg/kg)	3.79			3.10	2.80
	Mercury (Hg) (mg/kg)	0.0160			0.0093	0.0118
	Nickel (Ni) (mg/kg)	27.3			23.7	17.8
	Zinc (Zn) (mg/kg)	92.4			84.4	58.1

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1840266-11				
	Description					
	Sampled Date					
	Sampled Time					
	Client ID	MBH-16 SS4				
Grouping	**Analyte**					
SOIL						
Particle Size	% Gravel (>2mm) (%)					
	% Sand (2.00mm - 1.00mm) (%)					
	% Sand (1.00mm - 0.50mm) (%)					
	% Sand (0.50mm - 0.25mm) (%)					
	% Sand (0.25mm - 0.125mm) (%)					
	% Sand (0.125mm - 0.063mm) (%)					
	% Silt (0.063mm - 0.0312mm) (%)					
	% Silt (0.0312mm - 0.004mm) (%)					
	% Clay (<4um) (%)					
	Texture					
Metals	Arsenic (As) (mg/kg)	2.35				
	Cadmium (Cd) (mg/kg)	0.450				
	Chromium (Cr) (mg/kg)	44.1				
	Copper (Cu) (mg/kg)	45.5				
	Lead (Pb) (mg/kg)	3.09				
	Mercury (Hg) (mg/kg)	0.0077				
	Nickel (Ni) (mg/kg)	24.5				
	Zinc (Zn) (mg/kg)	81.7				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Cadmium (Cd)	DUP-H	L1840266-11

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
HG-200.2-CVAF-VA	Soil	Mercury in Soil by CVAFS	EPA 200.2/1631E (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAFS.

MET-200.2-CCMS-VA	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample matrix, for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V.

PSA-PIPET-DETAIL-SK	Soil	Particle size - Sieve and Pipette	SSIR-51 METHOD 3.2.1

Particle size distribution is determined by a combination of techniques. Dry sieving is performed for coarse particles, wet sieving for sand particles and the pipette sedimentation method for clay particles.

Reference:

Burt, R. (2009). Soil Survey Field and Laboratory Methods Manual. Soil Survey Investigations Report No. 5. Method 3.2.1.2.2. United States Department of Agriculture Natural Resources Conservation Service.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

15-59382

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1840266-COFC

COC Number: 15 - 59382

Page of

White Paper Co. 604-951-3900

Report To	Contact and company name below will appear on the final report
Company:	Stantec
Contact:	Barrie Tuite
Phone:	
	Company address below will appear on the final report
Street:	
City/Province:	
Postal Code:	
Invoice To	Same as Report To [X] YES [ ] NO
	Copy of Invoice with Report [ ] YES [ ] NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: [X] PDF [X] EXCEL [ ] EDD (DIGITAL)
Quality Control (QC) Report with Report [X] YES [ ] NO
[ ] Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: [X] EMAIL [ ] MAIL [ ] FAX
Email 1 or Fax: barrie.tuite@stantec.com
Email 2: Karen.Munro@stantec.com
Email 3:

Invoice Distribution

Select Invoice Distribution: [X] EMAIL [ ] MAIL [ ] FAX
Email 1 or Fax:
Email 2:

Project Information

ALS Account # / Quote #:
Job #:
PO / AFE:
LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center:
PO#:
Major/Minor Code:
Routing Code:
Requisitioner:
Location:

ALS Lab Work Order # (lab use only):
ALS Contact:
Sampler:

Confirm all E&P TATs with your AM - surcharges will apply

Regular [R] [X] Standard TAT if received by 3 pm - business days - no surcharges

PRIORITY (Business Days): 4 day [P4] [ ] | 3 day [P3] [ ] | 2 day [P2] [ ]

EMERGENCY: 1 Business day [E1] | Same Day, Weekend or Statutory holiday [E0]

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	MET-00-200.2 VA	PSA-PIPET + Density SK
	MBH-05 SS3	06-Oct-16	11:24	Sediment	✓	✓
	MBH-07 SS2a	"	11:30	"		✓
	MBH-07 SS3	"	11:35	"	✓	✓
	MBH-14 SS3	"	11:46	"		✓
	MBH-14 SS4	"	12:14	"		✓
	MBH-14 SS5	"	12:18	"	✓	✓
	MBH-15 SS4	"	12:26	"		✓
	MBH-16 SS3	"	12:31	"		✓
	MBH-16 SS4	"	12:35	"	✓	✓
	MBH-13 SS4	"	12:59	"	✓	✓
		"				
		"				

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System?
[ ] YES [ ] NO

Are samples for human drinking water use?
[ ] YES [ ] NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen [ ] | SIF Observations Yes [ ] No
Ice Packs [ ] Ice Cubes [ ] | Custody seal intact Yes [ ] No
Cooling Initiated [ ]

INITIAL COOLER TEMPERATURES °C | FINAL COOLER TEMPERATURES °C: 20°C

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)	
Released by: Barrie Tuite	Date: 06 Oct 2016	Time:	Received by:	Date:	Time:	Received by: SL	Date: Oct 6-16 1:50pm

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.