PHOTO 13: View of RV park, off-site.

PHOTO 14: View of Diesel Aboveground Storage Tank (AST), down gradient of the Site.

PHOTO 15: Parcel A - View of Oxygen/Acetylene canisters.

PHOTO 16: Parcel A - View of chemical storage - oil.

PHOTO 17: Off-site drain outfall on the bank of the Fraser River.

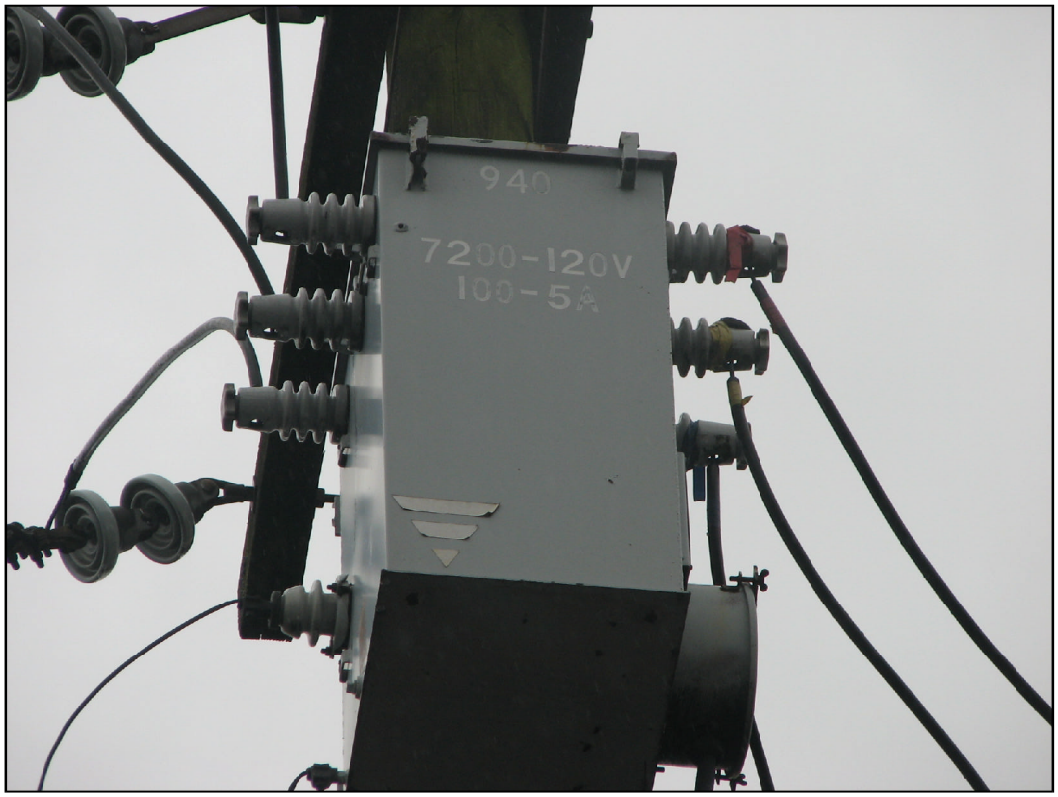

PHOTO 18: Parcel A - View of pole-mounted transformer.

PHOTO 19: Parcel A - Mill Electrical Building.

APPENDIX P

Interview Documentation

FACSIMILE

Suite 250, 1380 Burrard Street
Vancouver, BC V6Z 2H3
Phone: (604) 669-0424 Fax: (604) 669-0430
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ENVIRONMENTAL ENGINEERING, SCIENCE AND MANAGEMENT

TO:	David Gray	**FAX #:**	604-580-3646
FROM:	Seth Kingsbury	**FILE #:**	405-003.01
DATE:	May 4, 2006	**# OF PAGES (Incl. cover page):**	2

IF YOU DO NOT RECEIVE ALL OF THE PAGES, PLEASE CALL (604) 669-0424 extension 120

Mr. Gray,

We (Hemmera Envirochem) are conducting a Phase I Environmental Site Assessment (ESA) on behalf of the Fraser River Port Authority (FRPA) at the Brownsville Site in Surrey, BC.

Smallwood Sawmills occupies Parcel A to the southwest of the site (see attached Figure 1). Any information that can be provided with respect to the following questions pertaining to the site would be appreciated:

Smallwood Mill (overall Site)

1. Do you have any knowledge of spills or environmental incidents that have occurred?
2. If so, when? And are there any reports?
3. What are the current operations? When did the sawmill cease operations?

The Oil Storage Shed

1. Age of building?
2. Who operated/operates the building?
3. Is the shed currently being used? If not, when did it cease be used?
4. Do inventory records exist?

Electrical Building (see attached figure 1)

1. Dan Jones of Smallwood Sawmills indicated that a transformer is housed in the grey brick electrical building at the southeast corner of the mill exterior (see Fig 1). He also indicated that the transformer's oil was changed in 2003. Why was the oil changed? Did it contain PCBs? Is the building currently being used?

Regards,

Seth Kingsbury, B.Sc., AScT

Mill & Timber Products Ltd.

12770 - 116th Avenue, Surrey, British Columbia, Canada V3V 7H9
Telephone: (604) 580-2781 Fax No.: (604) 580-3646

May 5, 2006

Hemmera Environmental Engineering,
Science and Management
Suite 250, 1380 Burrard Street
Vancouver, BC V6Z 2H3

Attention: Seth Kingsbury

Dear Sirs:

Re: Smallwood Sawmill Site

1. We haven't had any spills or environmental incidents during our time on the site.

2. N/A.

3. We are currently processing finger joint blocks and chipping residuals at the site. We suspended operations in the sawmill in 2001.

The Oil Storage Shed

1. Unknown – you may be able to get information from Lindal.
2. Lindal used it; we used it.
3. Yes.
4. No.

Electrical Building

When we started up the trim block operation, we did some electrical upgrades including changing the transmission oil. There are no PCB's in the transformers. It is currently in use to power our operations there.

Yours truly,

Mill & Timber Products Ltd.

H. David Gray

Interview Record for the Brownsville Site

Project: 405-003.01

Date: April 26, 2006

Hemmera: John Taylor

Canadian National Railway (CNR) Company: Brian Pimblett

- Job title: Environmental Engineer – Pacific Division
- No known spills or incidents were reported in the general Site area from 1990 to present.

Interview Record for the Brownsville Site

Project: 405-003.01

Date: April 27, 2006

Hemmera: Seth Kingsbury

Smallwood Sawmills: Dan Jones

- Knowledgeable about the Site from 2003 to present.
- Job title: Manager
- The mill currently conducts a knot-out/finger joint/chipping operation.
- Age of mill: 40 to 50 years.
- No known chemical spills reported.
- No known dumpsites.
- The AST (diesel) is 5 to 6 years old, and is used to fuel forklifts.
- Chemicals stored onsite include oxygen and acetylene.
- The oil storage shed is not currently in use.
- No known effluent or air emissions.
- Solid waste is managed by BFI (dumpster).
- No known asbestos, lead paint, insulation, or oil/water separators.
- The grey brick building to the southeast of the sawmill contains electrical equipment that services the mill. It was inspected in 2004 at which time old oil was drained and new oil was put in. A transformer is in the building.
- A pole-mounted transformer is also onsite.

Interview Record for the Brownsville Site

Project: 405-003.01

Date: April 27, 2006

Hemmera: Seth Kingsbury

Lindal Cedar Homes: Gordon Fleming

- Knowledgeable about the Site from 1998 to present.
- Job title: Shipping Manager
- Lindal Cedar Homes currently using the Site for warehousing/distribution.
- No known chemical spills, dumpsites, or oil/water separators.
- No known hazardous materials (asbestos, lead paint, PCBs, ODSs).
- No air emissions, effluent or hazardous materials.
- The oil storage shed is part of Smallwood Mills.
- Provided AST (propane) information.
- The drainage system was installed by Lindal staff in the mid-1980s. The system drains directly into the Fraser River.
- Lindal Cedar operations were provided.

Interview Record for the Brownsville Site

Project: 405-003.01

Date: April 13, 2006

Hemmera: Seth Kingsbury

Fraser River Port Authority: Nures Kara

- Knowledgeable about the Site from1998 to present.
- Job title: Manager of Environmental Services.
- Provided Site occupancy information; Lindal Cedar Homes, Smallwood Sawmills and a Private Log Salvager.
- The oil stains beneath the cut-off saw in the mill were addressed in 2000/2001.
- The upland tenants are audited every 1 to 3 years.
- No knowledge of air emissions, effluent, chemical inventory, drainage, building ages, hazardous materials – referred to occupants.
- Previous environmental reports, photos, and Site data (leases, tax information) were provided.
- The log salvager has occupied Parcels Rem-C, 7 and 8 for approximately 3 years.
- The log salvager has used a band saw, front-end loader forklift and log picker on-Site during the course of occupation.

FINAL REPORT

Phase 2 Environmental Site Assessment
Brownsville Site, Surrey, BC

Prepared for:
FRASER RIVER PORT AUTHORITY
400 – 625 Agnes Street
New Westminster, BC V3M 5Y4

Prepared by:
HEMMERA
Suite 250-1380 Burrard Street
Vancouver, BC, V6Z 2H3

File: 405-003.02
May 2008

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EXECUTIVE SUMMARY

Hemmera was retained by the Fraser River Port Authority (FRPA) to complete a Phase 2 Environmental Site Assessment (ESA) for the Brownsville Site in Surrey, BC.

The Brownsville Site ("the Site") is a 1.43-hectare property owned by the Canadian National Railway (CNR) Company. The Site is comprised of six parcels (Parcel A, B, C, Rem-C, 7 and 8) situated between the Fraser River and the CNR rail line to the southwest of the Pattullo Bridge. This Phase 2 ESA program was conducted in support of a proposed property transfer from CNR to the Government of Canada, to be administered by the FRPA.

The objective of the Phase 2 ESA program was to assess soil and groundwater quality in areas of potential environmental concern (APECs) identified in a Phase I ESA (Hemmera, 2006) and to identify areas of environmental concern (AECs). The Phase 2 ESA program included:

- A borehole drilling program and monitoring well installation program to assess soil and groundwater quality at identified APECs; and
- An investigation of the area beneath the green chain.

The results of the Phase 2 ESA program indicate the following:

- A volatile petroleum hydrocarbon (VPH) concentration greater than the Contaminated Sites Regulation (CSR) industrial land use (IL) standard was identified in one soil sample collected from MW06-2.
- VPH and light extractable petroleum hydrocarbon (LEPH) concentrations greater than the CSR aquatic life (AW) standard were identified in the groundwater sample collected from MW06-2.
- Based on a review of the laboratory chromatograms for the exceeding soil and groundwater samples, the VPH and LEPH detected are consistent with Varsol (a hydrocarbon fluid often used as a solvent).

The sampling location MW06-2 is situated immediately down gradient of the CNR rail and Brownsville rail spur, and immediately upgradient of the current Lindal Cedar Homes warehouse and distribution building.

Based on the distribution and types of parameters measured in excess of the applicable CSR standards, the VPH exceedances in the soil and groundwater at MW06-2 appear to be associated with either APEC-2 (on-site Sawmill operations from approximately 1932 to present) or APEC-6 (Adjacent and up gradient historical industrial activities and Brownsville rail spur adjacent to Parcels A, B and C, Rem-C, 7 and 8).

If the FRPA assumes the Brownsville Site, the exceedances identified above would represent a liability to the FRPA. As such, several actions are recommended to further assess the source of these exceedances (i.e., is there an on-site or off-site source) and their risk to human health or the environment. These recommended actions are as follows:

1) Delineate the VPH and LEPH impacts in the groundwater at MW06-2;
2) Delineate the horizontal and vertical extent of VPH impacts in the soil at MW06-2; and
3) Investigate the area up gradient of MW06-2 to assess whether background concentrations could be migrating onto the Site from off-site sources.

It is also recommended that prior to the proposed property transfer, FRPA should identify and quantify the on-site waste materials (e.g. small pieces of abandoned machinery, tires, wood pallets, scrap wood, etc.) in order to assess future disposal costs. These waste materials would not likely result in Site contamination and do not represent an immediate environmental concern, but the assumption of a property with waste materials could represent a liability to FRPA, since the cost and responsibility associated with the appropriate off-site disposal of these materials would also be assumed.

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1.0 INTRODUCTION

Hemmera was retained by the Fraser River Port Authority (FRPA) to complete a Phase 2 Environmental Site Assessment (ESA) for the Brownsville Site in Surrey, BC (**Figure 1**).

The Brownsville Site ("the Site") is a 1.43-hectare property owned by the Canadian National Railway (CNR) Company. The Site is comprised of six parcels (Parcel A, B, C, Rem-C, 7 and 8) situated between the Fraser River and the CNR rail line southwest of the Pattullo Bridge (**Figure 2**). This Phase 2 ESA program was conducted in support of a proposed property transfer from CNR to the Government of Canada, to be administered by the FRPA.

1.1 OBJECTIVES

The objective of the Phase 2 ESA program was to assess the soil and groundwater quality in the areas of potential environmental concern (APECs) identified in the Phase I ESA (Hemmera, 2006) and to identify areas of environmental concern (AECs).

Based on the findings of the Phase 1 ESA, it was concluded there were four on-site APECs and three off-site APECs that could potentially impact soil and/or groundwater on-site (Hemmera, 2006). The APECs and their constituents of potential concern (COPCs), investigation rationale and investigation locations are summarized in **Table 1** and **Table 2** below.

Table 1: Summary On-Site APECs and COPCs

APEC No.	APEC Description	Media	COPCs	Investigation Rationale	Investigation Locations
1	Oil Storage Shed	Soil and Groundwater	Petroleum Hydrocarbons	Extensive staining inside and outside of storage shed and unprotected drums stored outside shed, as observed by PWGSC in 1996, by FRPA in July 2000, and by Hemmera during 2006 Site visit. No secondary containment for drums in use inside shed. Smallwood Sawmill Ltd reportedly removed outside drums and oil-stained soil in September 2000, but extent of soil removal is unknown and many outside drums and staining are still present.	MW06-1
2	Sawmill operations located on-site (Parcels A, B, C, Rem-C, 7, and 8) from approximately 1932 to present	Soil and Groundwater	Petroleum Hydrocarbons, Metals, Chlorophenols	Specific sawmill activities / locations are not known.	MW06-1, MW06-2, MW06-3, MW06-4, MW06-5
3	Oil stains/odours observed beneath the green chain	Soil and Potentially Groundwater	Petroleum Hydrocarbons	Petroleum hydrocarbon odours and potential staining were observed beneath the green chain during 2006 Site visit. The ground surface beneath the green chain is concrete of unknown condition.	Detailed inspection
4	Historic fill materials of unknown origin, within top 2 to 3 m below ground surface (bgs) across the Site	Soil and Potentially Groundwater	Petroleum Hydrocarbons, Metals (particularly Zinc)	The age and origin of the fill materials is unknown, though the materials were likely placed on the Site prior to 1932. Historic soil samples within the Site fill materials indicated concentrations of zinc above the CSR standards. Site fill materials have never been sampled for petroleum hydrocarbons, the primary Site COPC.	MW06-1, MW06-2, MW06-3, MW06-4, MW06-5

Table 2: Summary Off-Site APECs and COPCs

APEC No.	APEC Description	Media	COPCs	Investigation Rationale	Investigation Locations
5	Former pentachlorophenol (PCP) spraying tank reportedly located immediately southeast of Parcel 7 (near railroad tracks). PCP-treated wood was also reportedly stored adjacent to the Site for drying.	Soil and Groundwater	Petroleum Hydrocarbons, Chlorophenols	Identified during 1996 investigation by PWGSC, and discussed in 2000 FRPA report and 2002 Keystone report. Stacked wood reportedly placed on supports and hand-sprayed with PCP pumped from a tank. Surface below tank was apparently asphalt paved, but the extent and condition of the historic paving is unknown. Treated products were then reportedly stored south of the railroad tracks.	MW06-4
6	Adjacent and up gradient historical industrial activities and Brownsville rail spur adjacent to Parcels A, B and C, Rem-C, 7 and 8.	Soil and Groundwater	Petroleum Hydrocarbons, Metals, Chlorophenols	Milling operations or related industries have been adjacent to the Site since at least 1932, and the rail spur has been present since 1891. A metal depot was operated adjacent (northwest of the Site) from 1970 to 1985. Historical light industrial operations, including auto body repair shops, shingle production, and concrete production were located within 300 m of the Site.	MW06-1, MW06-2, MW06-3, MW06-4, MW06-5
7	RV Park Diesel Spill	Soil and Groundwater	Petroleum Hydrocarbons	BC Site registry search indicated a diesel spill occurred at 11940 Old Yale Road (RV Park) in 1999. The Site is currently “ACTIVE UNDER ASSESSMENT” according to BC MOE.	MW06-4, MW06-5

1.2 SCOPE OF WORK

To achieve the objectives identified above, the following work was completed as part of the Phase 2 ESA program:

- A Site specific health and safety plan (HASP) was developed and presented to Hemmera field staff and subcontractors prior to commencing work;
- Underground utility lines (potential and known) in the vicinity of proposed borehole locations were identified through the use of a private utility locate company (Inter-Project Systems). Proposed borehole locations were moved a safe working distance (at least 2 m) from identified potential or known underground utility;

- Boreholes were advanced to investigate soil quality in the identified APECs;
- Monitoring wells were installed to investigate groundwater quality in the identified APECs;
- Groundwater monitoring was completed. Combustible headspace vapours (CHVs) and depth to water measurements were collected;
- Soil and groundwater samples were collected (from the boreholes and monitoring wells, respectively) and were submitted to the laboratory for analysis of COPCs;
- A differential survey of the monitoring wells was completed;
- Monitoring well locations were measured relative to local datum;
- The area beneath the green chain (APEC 3) was assessed and a surface soil sample was collected;
- Soil and groundwater data was interpreted; and
- A report of the Phase 2 ESA findings was prepared (this report).

1.3 PROFESSIONAL STATEMENT

This report includes the interpretation of sampling program results and a comparison of chemical analytical data to applicable standards specified in the BC Ministry of Environment (MOE) Contaminated Sites Regulation (CSR), including amendments, up to B.C. Reg. 239/2007, which came into effect July 1, 2007. This report has been prepared using a protocol that is consistent with the requirements of the MOE *Environmental Management Act* and the CSR (as amended).

This report also includes the interpretation of investigation results and comparison of analytical data to The *Canadian Environmental Quality Guidelines,* as established by the Canadian Council of Ministers for the Environment (CCME 2005) (as requested by the FRPA).

Hemmera confirms that the persons signing this report have demonstrable experience in the investigation of the type of constituents of concern at the Brownsville Site.

2.0 REGULATORY POLICY AND FRAMEWORK

The following section describes the regulatory framework under which the work was completed.

2.1 PROVINCIAL LEGISLATION AND REGULATIONS

Given that the Site is located in BC, the relevant provincial legislation includes the British Columbia *Environmental Management Act* (EMA). Under the EMA, the CSR and the *Hazardous Waste Regulation* (HWR) are the relevant regulations to this Site and provide standards for soil and groundwater at contaminated sites in BC.

2.2 FEDERAL LEGISLATION AND GUIDELINES

As requested by the FRPA, federal legislation and guidelines have been provided for reference. Federal environmental quality guidelines and standards for soil and groundwater are governed by the *Canadian Environmental Quality Guidelines* and *Canada Wide Standards for Petroleum Hydrocarbons in Soil* (CWS*).*

The Canadian Environmental Quality Guidelines, as established by the Canadian Council of Ministers for the Environment (CCME 2005), include soil quality guidelines that are based on direct contact, ingestion and inhalation toxicity data. Guidelines exist for agricultural, residential/parkland, commercial, and industrial land uses. The water quality guidelines include guidelines for drinking water, recreational water, protection of freshwater and marine aquatic life, irrigation water and livestock water use.

The Canada Wide Standards for Petroleum Hydrocarbons in Soil (CWS*)* is a three-tiered risk based remedial standard developed for four generic land uses: agricultural, residential/parkland, commercial, and industrial. Petroleum hydrocarbons are divided into four fractions. Fraction 1 (F1) includes hydrocarbons from C_6 to C_{10}, Fraction 2 (F2) includes hydrocarbons from C_{10} to C_{16}, Fraction 3 (F3) includes hydrocarbons from C_{16} to C_{34}, and Fraction 4 (F4) includes hydrocarbons above C_{35}. Standards are available for each fraction based on whether the soil is coarse textured (median grain size > 75 μm) or fine textured (median grain size < 75 μm).

2.3 APPLICABLE SOIL STANDARDS

The applicable soil standards for the Brownsville Site are based on the BC MOE CSR. The current and future land use for the Site is industrial, therefore the CSR industrial land use (IL) standards are considered applicable.

In accordance with the CSR, the applicable matrix soil standards are:

- “Intake of contaminated soil” (mandatory for all sites);
- “Groundwater flow to surface water used by aquatic life (marine)”, (a Site specific feature); and
- “Toxicity to soil invertebrates and plants” (mandatory for all sites).

As a conservative measure, the most stringent of the above-noted matrix standards was used for evaluating soil quality at the Brownsville Site.

The federal CCME industrial land use (IL) guidelines, CWS IL standards have been provided (as requested by FRPA) for reference.

In accordance with the CCME, the CWS were used to analyse petroleum hydrocarbon parameters. The federal CWS use a different analytical method than the CSR extractable petroleum hydrocarbons (EPH) method and are therefore not directly comparable. However, the CWS F1 to F3 fractions are generally equivalent to volatile petroleum hydrocarbons (VPH) (C_6 to C_{10}), light extractable petroleum hydrocarbons (LEPH) (C_{10} to C_{19}) and heavy extractable petroleum hydrocarbons (HEPH) (C_{19}-C_{32}) respectively. There is no CSR equivalent to the CWS F4 fraction.

2.4 APPLICABLE GROUNDWATER STANDARDS

The applicable groundwater standards for the Site are based on the BC MOE CSR and are dependent upon water use, distance, and travel time to the closest down-gradient point of use.

With respect to groundwater use, a search of the BC groundwater well database indicated that one off-site groundwater well (domestic) is located approximately 1.5 km to the southeast and up gradient of the Site. Since the well is located approximately 1.5 km up gradient from the Site, CSR drinking water standards are not considered applicable.

The land in the vicinity of the Site is not used for agricultural purposes; therefore, neither irrigation nor livestock watering standards are applicable.

The closest surface body water is the Fraser River (a marine aquatic environment), located approximately 50 m down gradient and northwest of the Site. Due to proximity of the Fraser River, the CSR standards for the protection of marine and/or estuarine aquatic life (AW standards) are considered applicable.

Federal CCME guidelines for the protection of marine aquatic life (MAL) have been provided for reference (as requested by the FRPA). Environment Canada has acknowledged that the appropriate aquatic life groundwater evaluation criteria for federal contaminated sites includes the CCME Canadian Water Quality Guidelines for the protection of MAL multiplied by a factor of ten (CCME FAL x 10).

3.0 INVESTIGATION METHODOLOGY

3.1 SOIL INVESTIGATION PROGRAM

Boreholes were advanced using a truck-mounted drill rig with solid stem auger supplied by Beck Drilling Ltd. (BECK), of Richmond, BC on June 29, 2006. A total of five boreholes were advanced at the Site to a

maximum depth of 4.6 m below grade. Soil cuttings from the auger flytes were placed into labelled 55-gallon barrels for subsequent off-site disposal.

Borehole locations are illustrated on **Figure 2** attached.

As the Site soils were sufficiently cohesive, representative soil samples were collected directly from the solid stem auger flights at approximately 0.6 metre intervals and/or at specific horizons where notable changes were observed. The samples were monitored for combustible soil vapour (CSV) concentrations using a Gastector® 1238 ME hydrocarbon surveyor. Boreholes were logged for soil type; colour, consistency, moisture content, staining, odour, modifiers and other relevant observations based on the Unified Soil Classification System. Borehole logs are provided in **Appendix A**.

A total of 10 samples were submitted to Cantest Ltd. of Burnaby, BC for analysis of COPCs. Soil samples were selected for analysis based on field observations and CSV concentrations. The rationale for selecting soil samples for laboratory analysis are summarized in **Table 3** below:

Table 3: Soil Sample Submission Rationale

Sample ID	Rationale
MW06-1-2	This sample had the second highest CSV measured at this location. The sample with the highest CSV was measured within the peat layer and was not selected for analysis because elevated CSVs are commonly measured in peat, and are not necessarily indicative of hydrocarbon impacts.
MW06-1-5	This sample was selected to provide vertical delineation of potential impacts at shallower depths.
MW06-2-1	Surface sample: This sample was selected as APECs 2, 4 and 6 have potential contaminant sources that would originate at ground surface.
MW06-2-3	This sample had the highest CSV measured at this location (worst case).
MW06-3-1	Surface sample: This sample was selected as APECs 2, 4 and 6 have potential contaminant sources that would originate at ground surface.
MW06-3-3	This sample had the highest CSV measured at this location (worst case).
MW06-4-1	Surface sample: This sample was selected as APECs 2, 4 and 6 have potential contaminant sources that would originate at ground surface.
MW06-4-4	This sample was selected as it's situated at the water table, where light non-aqueous phase liquid (LNAPL) from potential on-site contaminant sources would be expected. The sample with the highest CSV was measured within the peat layer and was not selected for analysis because elevated CSVs are commonly measured in peat, and are not necessarily indicative of hydrocarbon impacts.
MW06-5-1	Surface sample: This sample was selected as APECs 2, 4 and 6 have potential contaminant sources that would have originated at ground surface.
MW06-5-5	This sample was selected as it's situated at the water table, where LNAPL (from potential on-site contaminant sources) would be expected. The sample with the highest CSV was measured within the peat layer and was not selected for analysis because elevated CSVs are commonly measured in peat, and are not necessarily indicative of hydrocarbon impacts.

A peat layer, wood chips and wood fragments were present in most of the boreholes, therefore a silica gel clean up was requested as part of the laboratory analysis for petroleum hydrocarbons. A silica gel cleanup removes interference from naturally occurring hydrocarbons. These naturally occurring hydrocarbons can augment petroleum hydrocarbon concentrations if not removed.

3.2 GROUNDWATER INVESTIGATION PROGRAM

As part of the Phase 2 ESA, five boreholes were completed as monitoring wells. Monitoring well installations were completed by BECK under the supervision of Hemmera.

Once the desired depth was reached in the each borehole, the drill auger was removed from the borehole and the monitoring well was constructed. The subsurface material encountered at the Site was sufficiently cohesive for the boreholes to remain open without sloughing. Monitoring well construction details are provided in **Appendix A** (borehole logs).

The monitoring wells were developed following installation to restore the natural hydraulic properties of the water-bearing formation after drilling. Monitoring well development included purging six well volumes from each well.

On July 5, 2006, groundwater monitoring and sampling was conducted at the five Site monitoring wells. Groundwater monitoring included measuring CHVs and depth to water. Groundwater sampling at each monitoring well location was conducted using a low-flow technique, involving a peristaltic pump and dedicated peristaltic tubing. The low flow technique was used to collect groundwater samples submitted for analysis of extractable hydrocarbons (EH_w), light extractable petroleum hydrocarbons ($LEPH_w$), heavy extractable petroleum hydrocarbons ($HEPH_w$), polycyclic aromatic hydrocarbons (PAHs), chlorinated phenols and metals. Bailers were then used to collect groundwater samples submitted for benzene, toluene, ethyl benzene, xylenes (BTEX), volatile organic compounds (VOC_w), and volatile petroleum hydrocarbon (VPH_w) analysis.

On July 18, 2006, a manual differential elevation survey was conducted. Elevation measurements (relative to a 100 m datum) were collected from the top of casing and from the surrounding ground surface at each monitoring well location.

3.3 GREEN CHAIN INVESTIGATION

The area beneath the green chain (APEC 3) was assessed on June 29, 2006. Wood debris was removed from various locations beneath the green chain, and the concrete surface beneath the wood debris was reviewed in detail and photographed. One hole was identified in the concrete surface and a surface soil sample (SS06-1) was collected from this hole. Other than this hole, the concrete surface appeared to be

continuous. Surface soil sample SS06-1 was monitored for CSV using a Gastector® 1238 ME hydrocarbon surveyor.

3.4 QA/QC FOR THE INVESTIGATION PROGRAM

3.4.1 Field QA/QC

Hemmera's field quality assurance/quality control program (QA/QC) included practicing standard soil and groundwater-sampling protocols to minimise the potential for cross contamination between samples. The field QA/QC procedure also included the collection and analysis of blind field duplicates. Three field duplicate soil samples and one field duplicate groundwater samples were collected from randomly selected borehole and monitoring well locations during Site investigation activities. One soil and one groundwater duplicate sample were submitted for laboratory analysis.

The QA/QC methods were evaluated by determining the relative percent differences (RPD) between characterization samples and their field duplicates. In cases where the concentration of a parameter was less than five times the reported detection limit (RDL), the RPD was not calculated since concentrations near the detection limit of the laboratory method are not typically precise. The RPD data quality objectives were 20% for groundwater parameters and 30% for soil parameters.

3.4.2 Laboratory QA/QC

Soil and groundwater analyses were completed by Cantest Ltd., of Burnaby, BC (Cantest). The samples submitted to Cantest were subjected to QA/QC procedures specific to the laboratory. Laboratory QA/QC included internal/surrogate standards, replicates and duplicates, method blanks and method spikes. The Cantest QA/QC procedures are included in each certified laboratory report (**Appendix B**).

4.0 INVESTIGATION PROGRAM RESULTS

The results of the investigation program are presented below.

4.1 GEOLOGY

The typical soil stratigraphy encountered at the Brownsville Site is summarized in **Table 4** below:

Table 4: Summary of Soil Stratigraphy

Approximate Elevation*		Thickness (m)	Soil Description
Top	Bottom		
100.4 to 99.8	98.9 to 98.2	0.9 to 2.1	SAND: medium to fine grained, trace silt, brown to dark grey, loose, poorly graded.
98.9 to 98.2	98.3 to 97.7	0.0 to 0.6	PEAT: some sand, medium to fine grained, trace silt, dark brown, loose, poorly graded, with wood chips/fragments. (This peat layer was encountered in each Hemmera borehole except for MW06-2)
98.3 to 97.7	96.8 to 95.7	1.5 to 2.2	SILT: trace sand, trace clay, dark grey, medium stiff, poorly graded, moist to wet, trace peat and wood fragments.

* Elevation relative to 100 m datum (top of concrete pad at base of conveyor belt that feeds the storage bunker on Parcel A)

Further details regarding the Site stratigraphy are provided on the borehole logs in **Appendix A**.

4.2 GROUNDWATER FLOW

Groundwater flow was inferred to be towards the Fraser River (northwest) and is expected to be heavily influenced by surface water levels in the nearby Fraser River. Hemmera measured groundwater elevations across the Site on July 5, 2006. The groundwater elevations on this date ranged from 98.83 m on Parcel A (in reference to the Site specific datum) to 97.33 m on Parcel 7. Groundwater elevations are presented on **Table 6**.

4.3 QA/QC RESULTS

Results of the RPD calculations are included in the soil and groundwater analytical tables (**Tables 5 and 6**). The RPD data quality objectives are 20% for groundwater parameters and 30% for soil parameters.

4.3.1 Groundwater

The groundwater sample duplicate set (MW06-1 and Dup 05/07/06) exceeded the RPD data quality objective in one (aluminium 62%) out of 109 analyzed groundwater parameters. As the groundwater data quality objective was exceeded, the highest concentration (between the original sample and the field duplicate) was conservatively used.

4.3.2 Soil

The initial soil sample duplicate set (MW06-1-2 and Dup-1) exceeded the RPD data quality objective for lead and copper. Additionally, concentrations of other metals parameters (including antimony, arsenic, and tin) exceeded the applicable standard in the original sample (MW06-1-2), but were below laboratory detection limit in the duplicate sample (Dup-1). Based on the discrepancy of the laboratory results for metals in soil, Cantest was requested to conduct a quality assurance investigation (see **Appendix B** for Cantest Quality Assurance Report). The two samples (MW06-1-2 and Dup-1) were re-prepared and re-analyzed in duplicate, resulting in each sample being analysed three times. Good agreement was obtained between samples MW06-1-2 and Dup-1 from the re-analysis results. As an explanation for the initial discrepancy between these results, Cantest stated, "We can only speculate that there might be slight difference in the sample content between the two bottles…such that the high concentrations found initially…were not repeated in the re-analysis."

As five out of six soil samples analyzed for metals within the duplicate data set are in agreement, the initial sample analyzed from MW06-1-2 is considered to be anomalous and not representative of soil quality at this location. The highest concentration (between the five samples subsequently analyzed and in agreement) was conservatively used.

For the remaining parameters analyzed in soil, the duplicate set (MW06-1-2 and Dup-1) exceeded the RPD data quality objective for moisture and toluene. As the data quality objective was exceeded, the highest concentration between the original sample and the field duplicate was conservatively used.

4.4 SOIL ANALYTICAL RESULTS

The results of the soil analytical program are presented in **Table 5**. Soil concentrations were reported in excess of the applicable CSR IL standards in one soil sample collected from MW06-2, as follows:

- MW06-2-3 (from 1.8 to 2.4 m bgs) reported a soil concentration of VPH that exceeded the CSR IL standard. VOCs were not detected in this sample.

Soil concentrations were reported in excess of the CCME IL guidelines in one soil sample collected from MW06-1, as follows:

- MW06-1-2 (from 0.3 to 0.91 m bgs) reported a soil concentration of toluene that exceeded the CCME guideline for material with a median grain size of <=75 µm (silts and clays). As MW06-1-2 was not submitted for grain-size analysis, the most stringent guideline for toluene was applied. Based on field data (i.e. the sample was described as "medium to fine grained sand with trace silt"), the median grain-size was >75 µm (sands and gravels). Assuming the grain-size was >75 µm, the toluene concentration does not exceed the guideline and is not considered a concern. To confirm, a soil sample from this location would have to be re-collected and submitted for grain-size analysis.

The CCME IL stipulates a pH range (not less than 6 and not greater than 8). Based on this range, a number of soil samples had pH levels less than 6.

Borehole locations along with soil concentration in excess of the CSR IL standards are presented on **Figure 3** and copies of the laboratory reports are presented in **Appendix B**.

4.5 GROUNDWATER ANALYTICAL RESULTS

The results of the groundwater analytical program are presented in **Table 6**. Groundwater concentrations were reported in excess of the applicable CSR AW standards in one groundwater sample collected from MW06-2, as follows:

- MW06-2 reported groundwater concentrations of VPH and LEPH that exceeded the CSR AW standards. VOCs were not analysed in the groundwater sample collected from this location[1].

The groundwater samples did not contain concentrations of the analyzed parameters greater than CCME guidelines[2].

The monitoring well locations, along with groundwater concentrations in excess of the CSR AW standards, are presented on **Figure 3**. Copies of analytical laboratory reports and chain of custody forms for the soil analyses are presented in **Appendix B**.

4.6 GREEN CHAIN INVESTIGATION RESULTS

A detailed review of the area beneath the green chain indicated that the green chain concrete base was continuous and intact with the exception of one small hole located in the southwestern end of the green-chain (approximately 0.3 m in diameter and 0.1 m in depth). A surface soil sample (SS06-1) was collected from within this hole (see **Figure 2**). As no evidence of hydrocarbon impacts were observed (i.e. no hydrocarbon odour or staining) and the CSV measurement was 0 ppm, this sample was not submitted to the laboratory for analysis.

1 VOCs were analyzed in groundwater collected from MW06-2 in July 2007 during supplemental Phase 2 ESA activities.
2 There are no CCME guidelines for VPH or LEPH.

5.0 DISCUSSION AND CONCLUSIONS

The results of the Phase 2 ESA program indicate the following:

a) A VPH concentration greater than the CSR IL standard was identified in one soil sample collected from MW06-2. This sample was collected from 1.8 to 2.4 m bgs, which is below the groundwater table in that area. The horizontal and vertical extent of elevated VPH soil concentrations in this area is not known.

b) VPH and LEPH concentrations greater than the CSR AW standard were identified in the groundwater sample collected from MW06-2. The extent of elevated VPH and LEPH concentrations in the groundwater in this area is not known.

c) The sampling location MW06-2 is situated immediately down gradient of the CNR rail and Brownsville rail spur, and immediately upgradient of the current Lindal Cedar Homes warehouse and distribution building. In addition to the CNR rail and Brownsville Rail Spur, light industrial operations, including wood processing and manufacturing and shingle manufacturing are located up gradient of MW06-2, across the railroad tracks.

d) Based on a review of the laboratory chromatograms, the elevated VPH concentrations detected in the soil and groundwater samples collected from MW06-2 are consistent with Varsol (a hydrocarbon fluid often used as a solvent).

e) Solvents such as Varsol may also contain VOCs. VOCs were not detected in soil sample MW06-2-3, where the elevated VPH was detected. However, VOCs were not analysed in the groundwater sample collected from MW06-2, and should be, to better characterise the impacts and potential contaminant source(s) in the vicinity of MW06-2[3].

f) Toluene greater than the CCME guideline for material with a median grain size of <=75 µm (silts and clays) was identified in one soil sample collected from MW06-1-2. As this sample was not submitted for grain-size analysis, the most stringent guideline for toluene was applied. Based on field data (i.e. the sample was described as “medium to fine grained sand with trace silt”), the median grain-size was >75 µm (sands and gravels). Assuming the grain-size was >75 µm, the toluene concentration does not exceed the guideline and is not considered a concern. To confirm, a soil sample from this location would have to be re-collected and submitted for grain-size analysis.

g) The groundwater samples did not contain concentrations of the COPCs greater than CCME guidelines.

[3] VOCs were analyzed in groundwater collected from MW06-2 in July 2007 during supplemental Phase 2 ESA activities.

Based on the distribution and types of parameters measured in excess of the applicable CSR standards, the VPH exceedance in the soil and VPH and LEPH exceedances in the groundwater at MW06-2 appear to be associated with either APEC-2 (on-site Sawmill operations from approximately 1932 to present) or APEC-6 (adjacent and up gradient historical industrial activities and Brownsville rail spur adjacent to Parcels A, B and C, Rem-C, 7 and 8).

Based on a review of the Site investigation results, APEC-1, APEC-3, APEC-4, APEC-5 and APEC-7 were dismissed as AECs. The rationale for dismissing these APECs is summarised in **Table 7**.

Table 7: Summary of APEC Dismissal

APEC No.	APEC Description	Media	COPCs	Results of Investigation	AEC
1	Oil Storage Shed	Soil and Groundwater	Petroleum Hydrocarbons	Despite some hydrocarbon odours and staining, petroleum hydrocarbons were not detected in the groundwater and soil samples collected immediately adjacent to the Oil Storage Shed; metals concentrations were below the applicable standards.	No
2	Sawmill operations located on-site (Parcels A, B, C, Rem-C, 7, and 8) from approximately 1932 to present	Soil and Groundwater	Petroleum Hydrocarbons, Metals, Chlorophenols	VPH was detected in one soil sample collected from MW06-2 in concentrations greater than the applicable standard. VPH and LEPH were detected in one groundwater sample collected from MW06-2 in concentrations greater than the applicable standard.	Possibly
3	Oil stains/odours observed beneath the green chain	Soil and Potentially Groundwater	Petroleum Hydrocarbons	A detailed review of the area beneath the green chain indicated that the green chain concrete base was continuous and intact (no cracks or holes) with the exception of one small hole (approximately 0.3 m in diameter). A surface soil sample was collected from within this hole. No odour or evidence of hydrocarbon impacts were observed in this sample and the CSV measurement was 0 ppm.	No
4	Historic fill materials of unknown origin, within top 2 to 3 m bgs across the Site	Soil and Potentially Groundwater	Petroleum Hydrocarbons, Metals (particularly Zinc)	Petroleum hydrocarbons and metals (including Zinc) were not detected above the applicable standards in soil samples collected from the on-site fill.	No
5	Former PCP spraying tank reportedly located immediately southeast of Parcel 7 (near railroad tracks). PCP-treated wood was also reportedly stored adjacent to the Site for drying.	Soil and Groundwater	Petroleum Hydrocarbons, Chlorophenols	Petroleum hydrocarbons and chlorophenols were not detected above the applicable standards in soil or groundwater samples collected from MW06-4.	No
6	Adjacent and up gradient historical industrial activities and Brownsville rail spur adjacent to Parcels A, B and C, Rem-C, 7 and 8.	Soil and Groundwater	Petroleum Hydrocarbons, Metals, Chlorophenols	VPH was detected in one soil sample collected from MW06-2 in concentrations greater than the applicable standard. VPH and LEPH were detected in one groundwater sample collected from MW06-2 in concentrations greater than the applicable standard.	Possibly
7	RV Park Diesel Spill	Soil and Groundwater	Petroleum Hydrocarbons	Petroleum hydrocarbons were not detected above the applicable standards in soil or groundwater samples collected from MW06-4 and MW06-5.	No

6.0 RECOMMENDATIONS

If FRPA assumes the Brownsville Site, the VPH and LEPH exceedances identified above would represent a liability to the FRPA. As such, several actions are recommended to further assess the source of these exceedances (i.e., is there an on-site or off-site source) and their risk to human health or the environment. These recommended actions are as follows:

1) Delineate the VPH and LEPH impacts in the groundwater at MW06-2. A future groundwater sample collected from MW06-2 should also be analysed for VOCs;

2) Delineate the horizontal and vertical extent of VPH impacts in the soil at MW06-2; and

3) Investigate the area up gradient of MW06-2 to assess whether background concentrations could be migrating onto the Site from off-site sources.

It is also recommended that prior to the proposed property transfer, FRPA should identify and quantify the on-site waste materials (e.g. small pieces of abandoned machinery, tires, wood pallets, scrap wood, etc.) in order to assess future disposal costs. These waste materials would not likely result in Site contamination and do not represent an immediate environmental concern, but the assumption of a property with waste materials could represent a liability to FRPA, since the cost and responsibility associated with the appropriate off-site disposal of these materials would also be assumed.

We would be pleased to prepare a work plan to conduct this work. If you have any questions, or require anything further, please contact any of the undersigned.

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7.0 REFERENCES

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Public Works and Government Services Environmental Services (PWGSC), *Environmental Audit Report Brownsville/Port Mann CN Land Swap, Surrey BC.* August 23, 1996.

8.0 STATEMENT OF LIMITATIONS

This report ("Report") was prepared by Hemmera, based on fieldwork conducted by Hemmera, for the sole benefit and exclusive use the Fraser River Port Authority. The material in it reflects Hemmera's best judgment in light of the information available to it at the time of preparing this Report. Any use that a third party makes of this Report, or any reliance on or decision made based on it, is the responsibility of such third parties. Hemmera accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this Report.

Hemmera has performed the work as described above and made the findings and conclusions set out in this Report in a manner consistent with the level of care and skill normally exercised by members of the environmental science profession practicing under similar conditions at the time the work was performed.

This Report represents a reasonable review of the information available to Hemmera within the established Scope, work schedule and budgetary constraints. It is possible that the levels of contamination or hazardous materials may vary across the Site, and hence currently unrecognised contamination or potentially hazardous materials may exist at the Site. No warranty, expressed or implied, is given concerning the presence or level of contamination on the Site, except as specifically noted in this Report. The conclusions and recommendations contained in this Report are based upon applicable legislation existing at the time the Report was drafted. Any changes in the legislation may alter the conclusions and/or recommendations contained in the Report. Regulatory implications discussed in this Report were based on the applicable legislation existing at the time this Report was written.

In preparing this Report, Hemmera has relied in good faith on information provided by others as noted in this Report, and has assumed that the information provided by those individuals is both factual and accurate. Hemmera accepts no responsibility for any deficiency, mis-statement or inaccuracy in this Report resulting from the information provided by those individuals.

The liability of Hemmera to Fraser River Port Authority shall be limited to injury or loss caused by the negligent acts of Hemmera. The total aggregate liability of Hemmera related to this agreement shall not exceed the lesser of the actual damages incurred, or the total fee of Hemmera for services rendered on this project.

TABLES

Table 5
Soil Analytical Results
Fraser River Port Authority
Phase 2 ESA, Brownsville Site, Surrey, BC

	Location ID:		MW06-1									
	Sample ID:		MW06-1-2 [25]	MW06-1-2 (Dup-1) [25]		MW06-1-2 [25]	Dup-1 (MW06-1-2) [25]		MW06-1-2 (Lab dup) [25]	Dup-1 (MW06-1-2) (Lab Dup) [25]		MW06-1-5
	Description:		initital sample	duplicate of initial sample	*RPD (%)*	1st re-analysis of initial sample	1st re-analysis of duplicate sample	*RPD (%)*	2nd re-analysis of initial sampe	2nd re-analysis of duplicate sample	*RPD (%)*	-
	Date Sampled:		2006-06-29	2006-06-29		2006-06-29	2006-06-29		2006-06-29	2006-06-29		2006-06-29
	Sample Depth (m):		0.30-0.91	0.30-0.91	-	0.30-0.91	0.30-0.91	-	0.30-0.91	0.30-0.91	-	2.44-3.05
Parameter	**CCME IL [3,4]**	**CSR IL [5,6]**										
Sample Info												
Sample Depth, From (m)	-	-	0.304	0.304	-	0.304	0.304	-	0.304	0.304	-	2.438
Sample Depth, To (m)	-	-	0.914	0.914	-	0.914	0.914	-	0.914	0.914	-	3.048
Field Tests												
Field Vapours (ppm)	-	-	320	320	-	320	320	-	320	320	-	180
Physical Tests												
Moisture (%)	-	-	21.4	15.5	***32.0***	-	-	-	-	-	-	31.3
pH	6-8 [7,13]	-	6.9	7.6	*9.7*	7.2	7.4		7.2	7.4		-
Total Inorganics												
Phosphorus	-	-	458	466	*1.7*	-	-	-	-	-	-	-
Total Metals												
Aluminum	-	-	11400	11300	*0.9*	8110	8180	*0.9*	7940	8140	*2.5*	-
Antimony	40 [7]	40 [14]	**755**	<10	-	< 10	< 10	-	< 10	< 10	-	-
Arsenic	12 [8]	25 [15]	**23**	<10	-	< 10	< 10	-	< 10	< 10	-	-
Barium	2000 [8]	2000 [14]	71	65	*8.8*	56	59	*5.2*	61	57	*6.8*	-
Beryllium	8 [7]	8 [14]	<1	<1	-	< 1	< 1	nc	< 1	< 1	-	-
Boron	-	-	2	2	*0.0*	< 1	< 1	nc	< 1	< 1	-	-
Cadmium	22 [8]	2-500 [16]	<0.5	<0.5	-	< 0.5	< 0.5	nc	< 0.5	< 0.5	-	-
Calcium	-	-	4610	4580	*0.7*	4130	4040	*2.2*	3940	4100	*4.0*	-
Chromium	87 [8]	60 [15]	31	29	*6.7*	26	24	*8.0*	26	25	*3.9*	-
Cobalt	300 [7]	300 [14]	11	11	*0.0*	8	8	*0.0*	8	8	*0.0*	-
Copper	91 [8]	90-250 [17]	41	21	***64.5***	15	15	*0.0*	15	15	*0.0*	-
Iron	-	-	18100	17800	*1.7*	17000	16500	*3.0*	16600	16700	*0.6*	-
Lead	600 [8]	150-2000 [18]	**4370**	6	***199.5***	< 5	< 5	-	< 5	< 5	-	-
Magnesium	-	-	7930	7770	*2.0*	7010	7010	*0.0*	7080	7040	*0.6*	-
Manganese	-	-	373	393	*5.2*	327	327	*0.0*	319	337	*5.5*	-
Mercury	50 [8]	150 [19]	0.02	0.02	*0.0*	0.02	0.02	*0.0*	0.03	0.02	-	-
Molybdenum	40 [7]	40 [14]	<4	<4	-	< 4	< 4	-	< 4	< 4	-	-
Nickel	50 [8]	500 [14]	41	39	*5.0*	32	31	*3.2*	32	31	*3.2*	-
Potassium	-	-	588	625	*6.1*	484	528	*8.7*	507	517	*2.0*	-
Selenium	2.9 [8]	10 [14]	0.2	<0.2	-	< 1	< 1	-	< 1	< 1	-	-
Silver	40 [7]	40 [14]	<2	<2	-	< 2	< 2	-	< 2	< 2	-	-
Sodium	-	-	210	237	*12.1*	230	243	*5.5*	228	231	*1.3*	-
Strontium	-	100000 [20]	27	27	*0.0*	22	24	*8.7*	21	24	*13.3*	-
Tin	300 [7]	300 [14]	**617**	<5	-	< 5	< 5	-	< 5	< 5	-	-
Titanium	-	-	593	561	*5.5*	442	476	*7.4*	457	468	*2.4*	-
Vanadium	130 [8]	-	37	36	*2.7*	35	35	*0.0*	34	35	*2.9*	-
Zinc	360 [8]	150-600 [21]	50	48	*4.1*	39	38	*2.6*	39	38	*2.6*	-
Zirconium	-	-	5	4	*22.2*	4	5	*22.2*	4	5	*22.2*	-

Table 5
Soil Analytical Results
Fraser River Port Authority
Phase 2 ESA, Brownsville Site, Surrey, BC

	Location ID:		MW06-1									
	Sample ID:		MW06-1-2 [25]	MW06-1-2 (Dup-1) [25]		MW06-1-2 [25]	Dup-1 (MW06-1-2) [25]		MW06-1-2 (Lab dup) [25]	Dup-1 (MW06-1-2) (Lab Dup) [25]		MW06-1-5
	Description:		initital sample	duplicate of initial sample	*RPD (%)*	1st re-analysis of initial sample	1st re-analysis of duplicate sample	*RPD (%)*	2nd re-analysis of initial sampe	2nd re-analysis of duplicate sample	*RPD (%)*	-
	Date Sampled:		2006-06-29	2006-06-29		2006-06-29	2006-06-29		2006-06-29	2006-06-29		2006-06-29
	Sample Depth (m):		0.30-0.91	0.30-0.91	-	0.30-0.91	0.30-0.91	-	0.30-0.91	0.30-0.91	-	2.44-3.05
Parameter	**CCME IL [3,4]**	**CSR IL [5,6]**										
BTEX												
Benzene	0.0068-0.030 [9]	2.5 [15]	<0.03 [26]	<0.03 [26]	-	-	-	-	-	-	-	-
Ethylbenzene	0.018-0.082 [10]	20 [19]	<0.03 [26]	<0.03 [26]	-	-	-	-	-	-	-	-
Styrene	50 [7]	50 [14]	<0.03	<0.03	-	-	-	-	-	-	-	-
Toluene	0.08-0.37 [11]	25 [19]	**0.26**	**0.18**	***36.4***	-	-	-	-	-	-	-
Xylenes	2.4-11 [12]	50 [19]	<0.03	<0.03	-	-	-	-	-	-	-	-
EPHs												
EPH10-19 (Si-gel)	-	2000 [22]	<250	<250	-	-	-	-	-	-	-	<250
EPH19-32 (Si-gel)	-	5000 [22]	<250	<250	-	-	-	-	-	-	-	<250
LEPH (Si-gel)	-	2000 [14]	<250	<250	-	-	-	-	-	-	-	-
HEPH (Si-gel)	-	5000 [14]	<250	<250	-	-	-	-	-	-	-	-
VPHs												
VH6-10	-	-	<100	<100	-	-	-	-	-	-	-	-
VPH	-	200 [14]	<100	<100	-	-	-	-	-	-	-	-
PAHs												
2-Methylnaphthalene	-	-	0.12	0.18	-	-	-	-	-	-	-	-
Acenaphthene	-	-	<0.05	<0.05	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	<0.05	<0.05	-	-	-	-	-	-	-	-
Anthracene	-	-	<0.05	<0.05	-	-	-	-	-	-	-	-
Benzo(a)anthracene	10 [7]	10 [14]	<0.05	<0.05	-	-	-	-	-	-	-	-
Benzo(a)pyrene	0.7 [8]	10 [19]	<0.05	<0.05	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	10 [7]	10 [14]	<0.05	<0.05	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	<0.05	<0.05	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	10 [7]	10 [14]	<0.05	<0.05	-	-	-	-	-	-	-	-
Chrysene	-	-	<0.05	<0.05	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	10 [7]	10 [14]	<0.05	<0.05	-	-	-	-	-	-	-	-
Fluoranthene	-	-	0.08	<0.05	-	-	-	-	-	-	-	-
Fluorene	-	-	<0.05	<0.05	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	10 [7]	10 [14]	<0.05	<0.05	-	-	-	-	-	-	-	-
Naphthalene	22 [8]	50 [14]	0.24	0.07	-	-	-	-	-	-	-	-
Phenanthrene	50 [7]	50 [14]	0.13	0.1	-	-	-	-	-	-	-	-
Pyrene	100 [7]	100 [14]	0.09	<0.05	-	-	-	-	-	-	-	-
Total PAH's	-	-	0.65	0.35	-	-	-	-	-	-	-	-

Table 5
Soil Analytical Results
Fraser River Port Authority
Phase 2 ESA, Brownsville Site, Surrey, BC

	Location ID:	MW06-1									
	Sample ID:	MW06-1-2 [25]	MW06-1-2 (Dup-1) [25]	RPD (%)	MW06-1-2 [25]	Dup-1 (MW06-1-2) [25]	RPD (%)	MW06-1-2 (Lab dup) [25]	Dup-1 (MW06-1-2) (Lab Dup) [25]	RPD (%)	MW06-1-5
	Description:	initital sample	duplicate of initial sample		1st re-analysis of initial sample	1st re-analysis of duplicate sample		2nd re-analysis of initial sampe	2nd re-analysis of duplicate sample		-
	Date Sampled:	2006-06-29	2006-06-29		2006-06-29	2006-06-29		2006-06-29	2006-06-29		2006-06-29
	Sample Depth (m):	0.30-0.91	0.30-0.91	-	0.30-0.91	0.30-0.91	-	0.30-0.91	0.30-0.91	-	2.44-3.05
Parameter	**CCME IL [3,4]**	**CSR IL [5,6]**									
VOCs											
1,1,1-Trichloroethane	-	50 [14]	<0.03	<0.03	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	50 [7]	9.3 [20]	<0.03	<0.03	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	-	50 [14]	<0.03	<0.03	-	-	-	-	-	-	-	-
1,1-Dichloroethane	50 [7]	50 [14]	<0.03	<0.03	-	-	-	-	-	-	-	-
1,1-Dichloroethene	50 [7]	50 [14]	<0.03	<0.03	-	-	-	-	-	-	-	-
1,2-Dibromoethane	-	0.28 [20]	<0.03	<0.03	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	10 [7]	10 [14]	<0.03	<0.03	-	-	-	-	-	-	-	-
1,2-Dichloroethane	50 [7]	50 [14]	<0.06	<0.06	-	-	-	-	-	-	-	-
1,2-Dichloroethene (cis)	-	50 [20]	<0.03	<0.03	-	-	-	-	-	-	-	-
1,2-Dichloroethene (trans)	-	50 [20]	<0.03	<0.03	-	-	-	-	-	-	-	-
1,2-Dichloropropane	50 [7]	50 [14]	<0.03	<0.03	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	10 [7]	10 [14]	<0.03	<0.03	-	-	-	-	-	-	-	-
1,3-Dichloropropene (cis)	-	50 [14]	<0.03	<0.03	-	-	-	-	-	-	-	-
1,3-Dichloropropene (trans)	-	50 [14]	<0.03	<0.03	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	10 [7]	10 [14]	<0.03	<0.03	-	-	-	-	-	-	-	-
2-Butanone (Methyl Ethyl Ketone)	-	27000 [20]	<1.5	<1.5	-	-	-	-	-	-	-	-
2-Hexanone	-	-	<1.5	<1.5	-	-	-	-	-	-	-	-
Bromodichloromethane	-	18 [20]	<0.03	<0.03	-	-	-	-	-	-	-	-
Bromomethane (Methyl Bromide)	-	13 [20]	<0.12	<0.12	-	-	-	-	-	-	-	-
Chlorobenzene	10 [7]	10 [14]	<0.03	<0.03	-	-	-	-	-	-	-	-
Chloroethane	-	65 [20]	<0.06	<0.06	-	-	-	-	-	-	-	-
Dibromochloromethane	-	26 [20]	<0.03	<0.03	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	-	310 [20]	<0.06	<0.06	-	-	-	-	-	-	-	-
Dichloromethane (Methylene Chloride)	50 [7]	50 [14]	<0.9	<0.9	-	-	-	-	-	-	-	-
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	-	2800 [20]	<0.6	<0.6	-	-	-	-	-	-	-	-
Methylene Bromide (Dibromomethane)	-	230 [20]	<0.03	<0.03	-	-	-	-	-	-	-	-
Monochloromethane (Methyl chloride)	-	26 [20]	<0.12	<0.12	-	-	-	-	-	-	-	-
Tetrachloroethylene (PERC)	0.6 [8]	5 [23]	<0.03	<0.03	-	-	-	-	-	-	-	-
Tetrachloromethane (Carbon tetrachloride)	50 [7]	50 [14]	<0.03	<0.03	-	-	-	-	-	-	-	-
Tribromomethane (Bromoform)	-	2200 [20]	<0.03	<0.03	-	-	-	-	-	-	-	-
Trichloroethylene (TCE)	0.01 [8]	0.65 [23]	<0.03 [26]	<0.03 [26]	-	-	-	-	-	-	-	-
Trichlorofluoromethane	-	2000 [20]	<0.03	<0.03	-	-	-	-	-	-	-	-
Trichloromethane (Chloroform)	50 [7]	50 [14]	<0.03	<0.03	-	-	-	-	-	-	-	-
Vinyl Chloride	-	7.5 [20]	<0.06	<0.06	-	-	-	-	-	-	-	-

Table 5
Soil Analytical Results
Fraser River Port Authority
Phase 2 ESA, Brownsville Site, Surrey, BC

	Location ID:		MW06-1									
	Sample ID:		MW06-1-2 [25]	MW06-1-2 (Dup-1) [25]		MW06-1-2 [25]	Dup-1 (MW06-1-2) [25]		MW06-1-2 (Lab dup) [25]	Dup-1 (MW06-1-2) (Lab Dup) [25]		MW06-1-5
	Description:		initital sample	duplicate of initial sample	*RPD (%)*	1st re-analysis of initial sample	1st re-analysis of duplicate sample	*RPD (%)*	2nd re-analysis of initial sampe	2nd re-analysis of duplicate sample	*RPD (%)*	-
	Date Sampled:		2006-06-29	2006-06-29		2006-06-29	2006-06-29		2006-06-29	2006-06-29		2006-06-29
	Sample Depth (m):		0.30-0.91	0.30-0.91	-	0.30-0.91	0.30-0.91	-	0.30-0.91	0.30-0.91	-	2.44-3.05
Parameter	**CCME IL [3,4]**	**CSR IL [5,6]**										
Phenols, Chlorinated												
2,3,4-Trichlorophenol	5 [7]	5 [14]	<0.01	<0.01	-	-	-	-	-	-	-	-
2,3,5-Trichlorophenol	-	5 [14]	<0.01	<0.01	-	-	-	-	-	-	-	-
2,3,6-Trichlorophenol	5 [7]	5 [14]	<0.01	<0.01	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	5 [7]	5 [14]	<0.01	<0.01	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	5 [7]	5 [14]	<0.01	<0.01	-	-	-	-	-	-	-	-
3,4,5-Trichlorophenol	5 [7]	5 [14]	<0.01	<0.01	-	-	-	-	-	-	-	-
Trichlorophenols	5 [7]	-	<0.01	<0.01	-	-	-	-	-	-	-	-
2,3,4,5-Tetrachlorophenol	5 [7]	5 [14]	<0.005	<0.005	-	-	-	-	-	-	-	-
2,3,4,6-Tetrachlorophenol	5 [7]	5 [14]	<0.005	<0.005	-	-	-	-	-	-	-	-
Tetrachlorophenols	5 [7]	-	<0.005	<0.005	-	-	-	-	-	-	-	-
Pentachlorophenol	7.6 [8]	0.15-50 [24]	<0.005	<0.005	-	-	-	-	-	-	-	-
Total Chlorinated Phenols	-	-	<0.005	<0.005	-	-	-	-	-	-	-	-

Table 5
Soil Analytical Results
Fraser River Port Authority
Phase 2 ESA, Brownsville Site, Surrey, BC

	Location ID:		MW06-2		MW06-3		MW06-4		MW06-5	
	Sample ID:		MW06-2-1	MW06-2-3	MW06-3-1	MW06-3-3	MW06-4-1	MW06-4-4	MW06-5-1	MW06-5-5
	Description:		-	-	-	-	-	-	-	-
	Date Sampled:		2006-06-29	2006-06-29	2006-06-29	2006-06-29	2006-06-29	2006-06-29	2006-06-29	2006-06-29
	Sample Depth (m):		0.46-1.07	1.83-2.44	0.30-0.91	1.52-1.98	0.00-0.61	2.74-3.05	0.00-0.61	2.44-3.05
Parameter	**CCME IL** [3,4]	**CSR IL** [5,6]								
Sample Info										
Sample Depth, From (m)	-	-	0.457	1.828	0.304	1.524	0	2.743	0	2.438
Sample Depth, To (m)	-	-	1.066	2.438	0.914	1.981	0.609	3.048	0.609	3.048
Field Tests										
Field Vapours (ppm)	-	-	60	520	60	150	10	25	10	20
Physical Tests										
Moisture (%)	-	-	-	26.9	17.9	35.8	-	29.1	-	52.1
pH	6-8 [7,13]	-	6.6	**5.7**	6.1	6.1	7.8	**5.1**	7.5	**5.5**
Total Inorganics										
Phosphorus	-	-	503	-	486	-	578	-	542	-
Total Metals										
Aluminum	-	-	10600	-	11200	-	11400	-	11900	-
Antimony	40 [7]	40 [14]	<10	-	<10	-	<10	-	<10	-
Arsenic	12 [8]	25 [15]	<10	-	<10	-	<10	-	<10	-
Barium	2000 [8]	2000 [14]	59	-	71	-	66	-	73	-
Beryllium	8 [7]	8 [14]	<1	-	<1	-	<1	-	<1	-
Boron	-	-	2	-	1	-	2	-	2	-
Cadmium	22 [8]	2-500 [16]	<0.5	-	<0.5	-	<0.5	-	<0.5	-
Calcium	-	-	3890	-	3710	-	6620	-	7640	-
Chromium	87 [8]	60 [15]	45	-	35	-	36	-	36	-
Cobalt	300 [7]	300 [14]	17	-	11	-	12	-	13	-
Copper	91 [8]	90-250 [17]	20	-	22	-	22	-	23	-
Iron	-	-	20200	-	17700	-	19600	-	19500	-
Lead	600 [8]	150-2000 [18]	390	-	6	-	7	-	6	-
Magnesium	-	-	7680	-	7530	-	8460	-	8970	-
Manganese	-	-	251	-	246	-	368	-	390	-
Mercury	50 [8]	150 [19]	0.02	-	0.03	-	0.03	-	0.03	-
Molybdenum	40 [7]	40 [14]	<4	-	<4	-	<4	-	<4	-
Nickel	50 [8]	500 [14]	41	-	40	-	42	-	45	-
Potassium	-	-	511	-	583	-	557	-	578	-
Selenium	2.9 [8]	10 [14]	<0.2	-	0.2	-	<0.2	-	0.2	-
Silver	40 [7]	40 [14]	<2	-	<2	-	<2	-	<2	-
Sodium	-	-	171	-	177	-	187	-	192	-
Strontium	-	100000 [20]	19	-	23	-	31	-	34	-
Tin	300 [7]	300 [14]	<5	-	<5	-	<5	-	<5	-
Titanium	-	-	578	-	572	-	545	-	567	-
Vanadium	130 [8]	-	42	-	37	-	43	-	40	-
Zinc	360 [8]	150-600 [21]	99	-	53	-	54	-	56	-
Zirconium	-	-	4	-	5	-	4	-	5	-

Table 5
Soil Analytical Results
Fraser River Port Authority
Phase 2 ESA, Brownsville Site, Surrey, BC

	Location ID:		MW06-2		MW06-3		MW06-4		MW06-5	
	Sample ID:		MW06-2-1	MW06-2-3	MW06-3-1	MW06-3-3	MW06-4-1	MW06-4-4	MW06-5-1	MW06-5-5
	Description:		-	-	-	-	-	-	-	-
	Date Sampled:		2006-06-29	2006-06-29	2006-06-29	2006-06-29	2006-06-29	2006-06-29	2006-06-29	2006-06-29
	Sample Depth (m):		0.46-1.07	1.83-2.44	0.30-0.91	1.52-1.98	0.00-0.61	2.74-3.05	0.00-0.61	2.44-3.05
Parameter	**CCME IL** [3,4]	**CSR IL** [5,6]								
BTEX										
Benzene	0.0068-0.030 [9]	2.5 [15]	-	<0.03 [26]	-	-	-	-	-	-
Ethylbenzene	0.018-0.082 [10]	20 [19]	-	<0.03 [26]	-	-	-	-	-	-
Styrene	50 [7]	50 [14]	-	<0.03	-	-	-	-	-	-
Toluene	0.08-0.37 [11]	25 [19]	-	<0.03	-	-	-	-	-	-
Xylenes	2.4-11 [12]	50 [19]	-	<0.03	-	-	-	-	-	-
EPHs										
EPH10-19 (Si-gel)	-	2000 [22]	-	970	<250	<250	-	<250	-	<250
EPH19-32 (Si-gel)	-	5000 [22]	-	<250	<250	<250	-	<250	-	<250
LEPH (Si-gel)	-	2000 [14]	-	970	-	-	-	<250	-	<250
HEPH (Si-gel)	-	5000 [14]	-	<250	-	-	-	<250	-	<250
VPHs										
VH6-10	-	-	-	960	-	-	-	-	-	-
VPH	-	200 [14]	-	**960**	-	-	-	-	-	-
PAHs										
2-Methylnaphthalene	-	-	-	<0.5	-	-	-	<0.05	-	<0.05
Acenaphthene	-	-	-	<0.5	-	-	-	<0.05	-	<0.05
Acenaphthylene	-	-	-	<0.5	-	-	-	<0.05	-	<0.05
Anthracene	-	-	-	<0.5	-	-	-	<0.05	-	0.07
Benzo(a)anthracene	10 [7]	10 [14]	-	<0.5	-	-	-	<0.05	-	0.44
Benzo(a)pyrene	0.7 [8]	10 [19]	-	<0.5	-	-	-	<0.05	-	0.51
Benzo(b)fluoranthene	10 [7]	10 [14]	-	<0.5	-	-	-	<0.05	-	0.85
Benzo(g,h,i)perylene	-	-	-	<0.5	-	-	-	<0.05	-	0.3
Benzo(k)fluoranthene	10 [7]	10 [14]	-	<0.5	-	-	-	<0.05	-	<0.05
Chrysene	-	-	-	<0.5	-	-	-	<0.05	-	0.47
Dibenz(a,h)anthracene	10 [7]	10 [14]	-	<0.5	-	-	-	<0.05	-	0.07
Fluoranthene	-	-	-	<0.5	-	-	-	<0.05	-	0.84
Fluorene	-	-	-	<0.5	-	-	-	<0.05	-	<0.05
Indeno(1,2,3-c,d)pyrene	10 [7]	10 [14]	-	<0.5	-	-	-	<0.05	-	0.34
Naphthalene	22 [8]	50 [14]	-	<0.5	-	-	-	<0.05	-	0.12
Phenanthrene	50 [7]	50 [14]	-	<0.5	-	-	-	<0.05	-	0.2
Pyrene	100 [7]	100 [14]	-	<0.5	-	-	-	<0.05	-	0.83
Total PAH's	-	-	-	-	-	-	-	-	-	5.03

Table 5
Soil Analytical Results
Fraser River Port Authority
Phase 2 ESA, Brownsville Site, Surrey, BC

	Location ID:		MW06-2		MW06-3		MW06-4		MW06-5	
	Sample ID:		MW06-2-1	MW06-2-3	MW06-3-1	MW06-3-3	MW06-4-1	MW06-4-4	MW06-5-1	MW06-5-5
	Description:		-	-	-	-	-	-	-	-
	Date Sampled:		2006-06-29	2006-06-29	2006-06-29	2006-06-29	2006-06-29	2006-06-29	2006-06-29	2006-06-29
	Sample Depth (m):		0.46-1.07	1.83-2.44	0.30-0.91	1.52-1.98	0.00-0.61	2.74-3.05	0.00-0.61	2.44-3.05
Parameter	**CCME IL** [3,4]	**CSR IL** [5,6]								
VOCs										
1,1,1-Trichloroethane	-	50 [14]	-	<0.03	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	50 [7]	9.3 [20]	-	<0.03	-	-	-	-	-	-
1,1,2-Trichloroethane	-	50 [14]	-	<0.03	-	-	-	-	-	-
1,1-Dichloroethane	50 [7]	50 [14]	-	<0.03	-	-	-	-	-	-
1,1-Dichloroethene	50 [7]	50 [14]	-	<0.03	-	-	-	-	-	-
1,2-Dibromoethane	-	0.28 [20]	-	<0.03	-	-	-	-	-	-
1,2-Dichlorobenzene	10 [7]	10 [14]	-	<0.03	-	-	-	-	-	-
1,2-Dichloroethane	50 [7]	50 [14]	-	<0.06	-	-	-	-	-	-
1,2-Dichloroethene (cis)	-	50 [20]	-	<0.03	-	-	-	-	-	-
1,2-Dichloroethene (trans)	-	50 [20]	-	<0.03	-	-	-	-	-	-
1,2-Dichloropropane	50 [7]	50 [14]	-	<0.03	-	-	-	-	-	-
1,3-Dichlorobenzene	10 [7]	10 [14]	-	<0.03	-	-	-	-	-	-
1,3-Dichloropropene (cis)	-	50 [14]	-	<0.03	-	-	-	-	-	-
1,3-Dichloropropene (trans)	-	50 [14]	-	<0.03	-	-	-	-	-	-
1,4-Dichlorobenzene	10 [7]	10 [14]	-	<0.03	-	-	-	-	-	-
2-Butanone (Methyl Ethyl Ketone)	-	27000 [20]	-	<1.5	-	-	-	-	-	-
2-Hexanone	-	-	-	<1.5	-	-	-	-	-	-
Bromodichloromethane	-	18 [20]	-	<0.03	-	-	-	-	-	-
Bromomethane (Methyl Bromide)	-	13 [20]	-	<0.12	-	-	-	-	-	-
Chlorobenzene	10 [7]	10 [14]	-	<0.03	-	-	-	-	-	-
Chloroethane	-	65 [20]	-	<0.06	-	-	-	-	-	-
Dibromochloromethane	-	26 [20]	-	<0.03	-	-	-	-	-	-
Dichlorodifluoromethane	-	310 [20]	-	<0.06	-	-	-	-	-	-
Dichloromethane (Methylene Chloride)	50 [7]	50 [14]	-	<0.9	-	-	-	-	-	-
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	-	2800 [20]	-	<0.6	-	-	-	-	-	-
Methylene Bromide (Dibromomethane)	-	230 [20]	-	<0.03	-	-	-	-	-	-
Monochloromethane (Methyl chloride)	-	26 [20]	-	<0.12	-	-	-	-	-	-
Tetrachloroethylene (PERC)	0.6 [8]	5 [23]	-	<0.03	-	-	-	-	-	-
Tetrachloromethane (Carbon tetrachloride)	50 [7]	50 [14]	-	<0.03	-	-	-	-	-	-
Tribromomethane (Bromoform)	-	2200 [20]	-	<0.03	-	-	-	-	-	-
Trichloroethylene (TCE)	0.01 [8]	0.65 [23]	-	<0.03 [26]	-	-	-	-	-	-
Trichlorofluoromethane	-	2000 [20]	-	<0.03	-	-	-	-	-	-
Trichloromethane (Chloroform)	50 [7]	50 [14]	-	<0.03	-	-	-	-	-	-
Vinyl Chloride	-	7.5 [20]	-	<0.06	-	-	-	-	-	-

Table 5
Soil Analytical Results
Fraser River Port Authority
Phase 2 ESA, Brownsville Site, Surrey, BC

	Location ID:		MW06-2		MW06-3		MW06-4		MW06-5	
	Sample ID:		MW06-2-1	MW06-2-3	MW06-3-1	MW06-3-3	MW06-4-1	MW06-4-4	MW06-5-1	MW06-5-5
	Description:		-	-	-	-	-	-	-	-
	Date Sampled:		2006-06-29	2006-06-29	2006-06-29	2006-06-29	2006-06-29	2006-06-29	2006-06-29	2006-06-29
	Sample Depth (m):		0.46-1.07	1.83-2.44	0.30-0.91	1.52-1.98	0.00-0.61	2.74-3.05	0.00-0.61	2.44-3.05
Parameter	**CCME IL** [3,4]	**CSR IL** [5,6]								
Phenols, Chlorinated										
2,3,4-Trichlorophenol	5 [7]	5 [14]	-	<0.01	<0.01	<0.01	-	<0.01	-	<0.01
2,3,5-Trichlorophenol	-	5 [14]	-	<0.01	<0.01	<0.01	-	<0.01	-	<0.01
2,3,6-Trichlorophenol	5 [7]	5 [14]	-	<0.01	<0.01	<0.01	-	<0.01	-	<0.01
2,4,5-Trichlorophenol	5 [7]	5 [14]	-	<0.01	<0.01	<0.01	-	<0.01	-	<0.01
2,4,6-Trichlorophenol	5 [7]	5 [14]	-	<0.01	<0.01	<0.01	-	<0.01	-	<0.01
3,4,5-Trichlorophenol	5 [7]	5 [14]	-	<0.01	<0.01	<0.01	-	<0.01	-	<0.01
Trichlorophenols	5 [7]	-	-	<0.01	<0.01	<0.01	-	<0.01	-	<0.01
2,3,4,5-Tetrachlorophenol	5 [7]	5 [14]	-	<0.005	<0.005	<0.005	-	<0.005	-	<0.005
2,3,4,6-Tetrachlorophenol	5 [7]	5 [14]	-	<0.005	<0.005	<0.005	-	<0.005	-	<0.005
Tetrachlorophenols	5 [7]	-	-	<0.005	<0.005	<0.005	-	<0.005	-	<0.005
Pentachlorophenol	7.6 [8]	0.15-50 [24]	-	<0.005	<0.005	<0.005	-	<0.005	-	<0.005
Total Chlorinated Phenols	-	-	-	<0.005	<0.005	<0.005	-	<0.005	-	<0.005

Table 5
Soil Analytical Results
Fraser River Port Authority
Phase 2 ESA
Brownsville Site, Surry, BC

(1) All values are reported as µg/g unless otherwise noted
(2) - = No standard or Not analyzed or Not calculated
(3) CCME = Canadian Council of Ministers of the Environment, Canadian Environmental Quality Guidelines, 1999, updated to January 2006
(4) CCME IL = Chapter 7, Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health, Summary Tables 1 and 2, Industrial land use, Update 7.0 September 2007
(5) CSR = BC Environmental Management Act, Contaminated Sites Regulation, B.C. Reg. 375/96, including amendments up to B.C. Reg. 239/2007, effective July 1, 2007
(6) CSR IL = Schedules 4 (Generic) and/or 5 (Matrix), Column VI Industrial, and/or Schedule 10, Column IV, Commercial, Industrial Soil Standard
(7) Table 2, Interim remediation criteria for soil that have not yet been replaced by Canadian Soil Quality Guidelines
(8) Table 1, Canadian Soil Quality Guidelines
(9) Benzene varies with Median grain size in µm as follows for CCME IL, Table 1, Canadian Soil Quality Guidelines:
0.0068 if Median grain size<=75
0.030 if Median grain size>75
(10) Ethylbenzene varies with Median grain size in µm as follows for CCME IL, Table 1, Canadian Soil Quality Guidelines:
0.018 if Median grain size<=75
0.082 if Median grain size>75
(11) Toluene varies with Median grain size in µm as follows for CCME IL, Table 1, Canadian Soil Quality Guidelines:
0.08 if Median grain size<=75
0.37 if Median grain size>75
(12) Xylenes varies with Median grain size in µm as follows for CCME IL, Table 1, Canadian Soil Quality Guidelines:
2.4 if Median grain size<=75
11 if Median grain size>75
(13) CCME IL stipulates pH not < 6 and not > 8
(14) Schedule 4, Generic Numerical Soil Standards
(15) Schedule 5, Environmental Protection, Groundwater flow to surface water used by aquatic life, Marine
(16) Cadmium varies with pH as follows for CSR IL, Schedule 5, Environmental Protection, Groundwater flow to surface water used by aquatic life, Marine:
2 if pH<7
3.5 if pH>=7 and pH<7.5
35 if pH>=7.5 and pH<8
200 if pH>=8
Otherwise, Schedule 5, Environmental Protection, Toxicity to soil invertebrates and plants applies (500 ug/g).
(17) Copper varies with pH as follows for CSR IL, Schedule 5, Environmental Protection, Groundwater flow to surface water used by aquatic life:
90 if pH<5
100 if pH>=5 and pH<5.5
200 if pH>=5.5 and pH<6
Otherwise, Schedule 5, Environmental Protection, Toxicity to soil invertebrates and plants applies (250 ug/g).
(18) Lead varies with pH as follows for CSR IL, Schedule 5, Environmental Protection, Groundwater flow to surface water used by aquatic life:
150 if pH<5.5
250 if pH>=5.5 and pH<6
Otherwise, Schedule 5, Environmental Protection, Toxicity to soil invertebrates and plants applies (2000 ug/g).
(19) Schedule 5, Environmental Protection, Toxicity to soil invertebrates and plants
(20) Schedule 10, Generic Numerical Soil and Water Standards, Column IV, Commercial, Industrial Soil Standard
(21) Zinc varies with pH as follows for CSR IL, Schedule 5, Environmental Protection, Groundwater flow to surface water used by aquatic life, Marine:
150 if pH<6.5
300 if pH>=6.5 and pH<7
Otherwise, Schedule 5, Environmental Protection, Toxicity to soil invertebrates and plants applies (600 ug/g).
(22) BC Ministry of Water, Land and Air Protection, Director of Waste Management, May 23, 2003, Update on Contaminated Sites, Clarification on Hydrocarbon Analytical Methods and Standards; the Director of Waste Management has extended the EPH/LEPH/HEPH equivalency to July 1, 2008; therefore, EPH concentrations not corrected for PAHs have been conservatively compared to the LEPH/HEPH standards
(23) Schedule 5, Environmental Protection, Groundwater flow to surface water used by aquatic life
(24) Pentachlorophenol varies with pH as follows for CSR IL, Schedule 5, Environmental Protection, Groundwater flow to surface water used by aquatic life:
0.15 if pH>=6.5 and pH<7.5
0.2 if pH>=7.5 and pH<8
0.3 if pH>=6 and pH<6.5
0.35 if pH>=8
2.5 if pH>=5.5 and pH<6
Otherwise, Schedule 5, Environmental Protection, Toxicity to soil invertebrates and plants applies (50 ug/g).
(25) MW06-1 and Dup-1 were re-analyzed for metals due to elevated RPDs for initial analysis.
(26) The laboratory reported detection limit is greater than the standard/guideline.
RPD = Relative percent difference (%)
RPD = Highlighted value exceeds the data quality objective

Table 6
Groundwater Analytical Results
Fraser River Port Authority
Phase 2 ESA, Brownsville Site, Surrey, BC

	Location ID:		MW06-1			MW06-2	MW06-3	MW06-4	MW06-5
	Sample ID:		MW06-1	MW06-1 (Dup 05/07/06)	*RPD (%)*	MW06-2	MW06-3	MW06-4	MW06-5
	Date Sampled:		2006-07-05	2006-07-05		2006-07-05	2006-07-05	2006-07-05	2006-07-05
Parameter	**CCME MALx10**[3,4]	**CSR AW**[5,6]							
Field Tests									
Field Conductivity (uS/cm)	-	-	220	220	-	640	321	612	342
Field pH	-	-	6.46	6.46	-	6.31	6.54	6.09	6.09
Field Temperature (ºC)	-	-	20.2	20.2	-	14.8	17.4	16.4	16.7
Field Vapours (ppm)	-	-	40	-	-	0	0	0	0
Physical Tests									
Hardness, Total (CaCO3) (mg/L)	-	-	60	64	*6.5*	234	147	194	145
pH	7-8.7[7]	-	**6.2**	**6**	*3.3*	**6.3**	**6.2**	**5.8**	**5.9**
Dissolved Inorganics									
Phosphorus (mg/L)	-	-	<0.150	<0.150	-	<0.150	<0.150	<0.150	<0.150
Dissolved Metals									
Aluminum	-	-	32	61	***62.4***	<5	7	<5	32
Antimony	-	200[8]	<1	<1	-	<1	<1	<1	<1
Arsenic	125	120[9]	22	21	*4.7*	2	3	<1	1
Barium	-	5000[9]	40	40	*0.0*	120	51	160	85
Beryllium	-	1000[9]	<1	<1	-	<1	<1	<1	<1
Bismuth	-	-	<1	<1	-	<1	<1	<1	<1
Boron	-	50000[8]	70	60	*15.4*	<50	<50	<50	<50
Cadmium	1.2	1[9]	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2
Calcium	-	-	17500	18800	*7.2*	69200	46600	53900	43200
Chromium	15	150[9]	1	1	*0.0*	<1	<1	<1	<1
Cobalt	-	40[8]	1	1	*0.0*	29	4	36	1
Copper	-	20[9]	1	1	*0.0*	<1	<1	<1	<1
Iron	-	-	13300	13100	*1.5*	1720	720	4850	2330
Lead	-	20[9]	<1	1	-	<1	<1	<1	<1
Lithium	-	-	2	2	*0.0*	1	1	3	2
Magnesium	-	-	3910	4110	*5.0*	14800	7310	14500	8960
Manganese	-	-	700	730	*4.2*	3750	1010	1990	1670
Mercury	0.16	1[8]	<0.02	<0.02	-	<0.02	<0.02	<0.02	<0.02
Molybdenum	-	10000[8]	1	1	-	1.6	1.3	0.5	<0.5
Nickel	-	83[9]	3	3	*0.0*	49	8	71	3
Potassium	-	-	2800	3000	*6.9*	2800	4400	5400	2900
Selenium	-	540[9]	<1	<1	-	<1	<1	<1	<1
Silicon	-	-	11900	11500	*3.4*	7600	13700	12400	10000
Silver	-	15[9]	<0.25	<0.25	-	<0.25	<0.25	<0.25	<0.25
Sodium	-	-	4790	4170	*13.8*	17900	8800	10000	3190
Strontium	-	-	75	80	*6.5*	320	110	250	180
Tellurium	-	-	<1	<1	-	<1	<1	<1	<1
Thallium	-	3[8]	<0.1	<0.1	-	<0.1	<0.1	0.1	<0.1
Thorium	-	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
Tin	-	-	<1	<1	-	<1	<1	<1	<1
Titanium	-	1000[8]	8	8	*0.0*	<1	1	<1	<1
Uranium	-	1000[9]	<0.5	<0.5	-	1	<0.5	0.6	<0.5
Vanadium	-	-	3	3	-	<1	<1	<1	<1
Zinc	-	100[9]	24	9	-	13	7	22	7
Zirconium	-	-	<10	<10	-	<10	<10	<10	<10

Table 6
Groundwater Analytical Results
Fraser River Port Authority
Phase 2 ESA, Brownsville Site, Surrey, BC

	Location ID:		MW06-1			MW06-2	MW06-3	MW06-4	MW06-5
		Sample ID:	MW06-1	MW06-1 (Dup 05/07/06)	*RPD (%)*	MW06-2	MW06-3	MW06-4	MW06-5
		Date Sampled:	2006-07-05	2006-07-05		2006-07-05	2006-07-05	2006-07-05	2006-07-05
Parameter	**CCME MALx10**[3,4]	**CSR AW**[5,6]							
BTEX									
Benzene	1100	1000[9]	<0.1	-	-	<0.5	-	-	-
Ethylbenzene	250	2500[9]	<0.1	-	-	0.7	-	-	-
Styrene	-	720[8]	<0.1	-	-	<0.5	-	-	-
Toluene	2150	3300[9]	<0.1	-	-	<0.5	-	-	-
Xylenes	-	-	5.3	-	-	2.5	-	-	-
EPHs									
EPH10-19	-	5000[8]	260	<250	-	2900	<250	<250	<250
EPH19-32	-	-	300	380	-	350	<250	<250	<250
LEPH	-	500[8]	260	<250	-	**2900**	<250	<250	<250
HEPH	-	-	300	380	-	350	<250	<250	<250
VPHs									
VH6-10	-	15000[8]	<100	-	-	2400	-	-	-
VPH	-	1500[8]	<100	-	-	**2400**	-	-	-
PAHs									
Acenaphthene	-	60[8]	0.68	<0.1	-	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1
Acridine	-	0.5[8]	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05
Anthracene	-	1[8]	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
Benzo(a)anthracene	-	1[8]	<0.01	<0.01	-	0.02	<0.01	<0.01	<0.01
Benzo(a)pyrene	-	0.1[8]	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	-	-	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	-	-	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
Chrysene	-	1[8]	<0.01	<0.01	-	0.02	<0.01	<0.01	<0.01
Dibenz(a,h)anthracene	-	-	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
Fluoranthene	-	2[8]	<0.04	<0.04	-	0.11	<0.04	<0.04	<0.04
Fluorene	-	120[8]	0.43	<0.05	-	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	-	-	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01
Naphthalene	14	10[8]	<0.3	<0.3	-	9.2	<0.3	<0.3	<0.3
Phenanthrene	-	3[8]	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05
Pyrene	-	0.2[8]	<0.02	<0.02	-	0.1	0.02	<0.02	<0.02
Quinoline	-	34[8]	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
Total PAH's	-	-	1.11	-	-	9.45	0.02	-	-

Table 6
Groundwater Analytical Results
Fraser River Port Authority
Phase 2 ESA, Brownsville Site, Surrey, BC

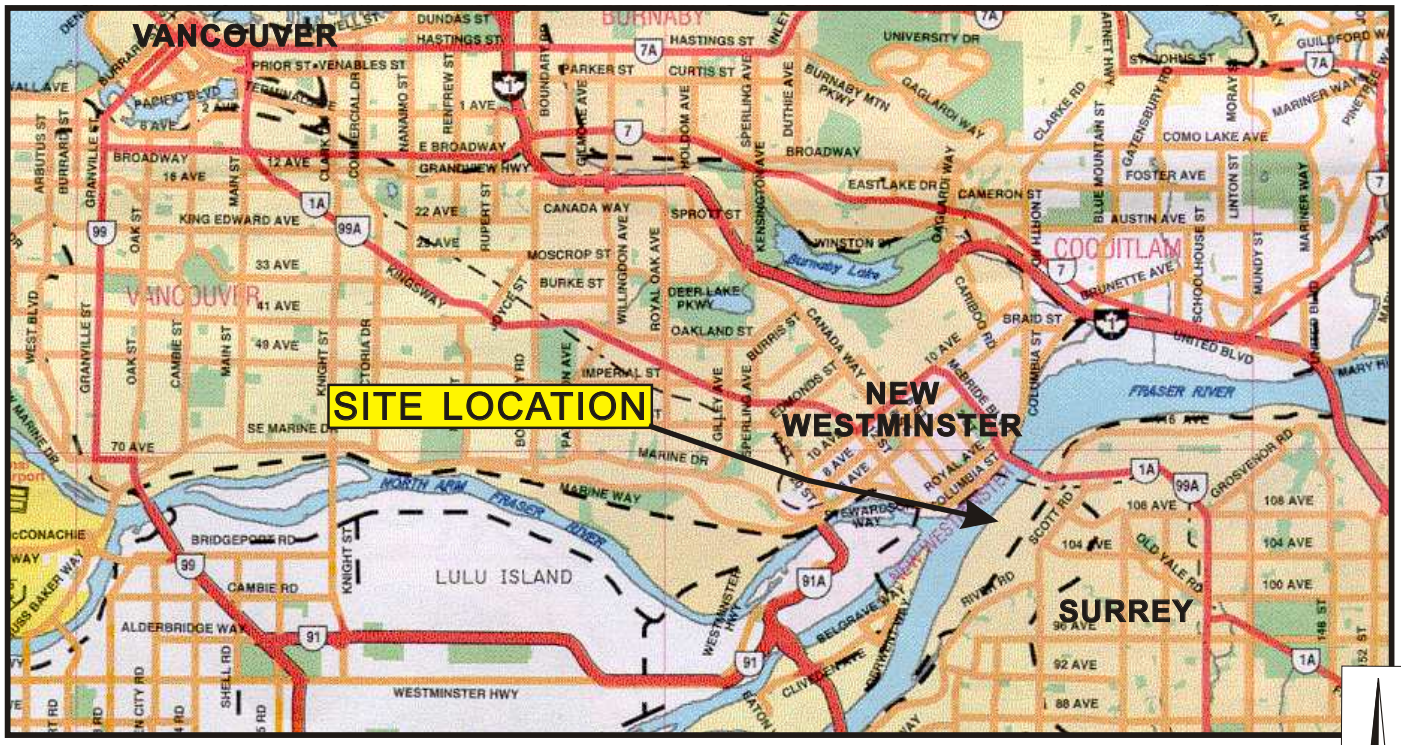
	Location ID:		MW06-1			MW06-2	MW06-3	MW06-4	MW06-5
	Sample ID:		MW06-1	MW06-1 (Dup 05/07/06)	*RPD (%)*	MW06-2	MW06-3	MW06-4	MW06-5
	Date Sampled:		2006-07-05	2006-07-05		2006-07-05	2006-07-05	2006-07-05	2006-07-05
Parameter	**CCME MALx10**[3,4]	**CSR AW**[5,6]							
VOCs									
1,1,1-Trichloroethane	-	-	<0.1	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	-	-	<0.2	-	-	-	-	-	-
1,1,2-Trichloroethane	-	-	<0.1	-	-	-	-	-	-
1,1-Dichloroethane	-	-	<0.1	-	-	-	-	-	-
1,1-Dichloroethene	-	-	<0.1	-	-	-	-	-	-
1,2-Dibromoethane	-	-	<0.1	-	-	-	-	-	-
1,2-Dichlorobenzene	420	420[9]	<0.1	-	-	-	-	-	-
1,2-Dichloroethane	-	1000[8]	<0.4	-	-	-	-	-	-
1,2-Dichloroethene (cis)	-	-	<0.1	-	-	-	-	-	-
1,2-Dichloroethene (trans)	-	-	<0.1	-	-	-	-	-	-
1,2-Dichloropropane	-	-	<0.1	-	-	-	-	-	-
1,3-Dichlorobenzene	-	1500[8]	<0.1	-	-	-	-	-	-
1,3-Dichloropropene (cis)	-	-	<0.1	-	-	-	-	-	-
1,3-Dichloropropene (trans)	-	-	<0.1	-	-	-	-	-	-
1,4-Dichlorobenzene	-	260[8]	<0.1	-	-	-	-	-	-
2-Butanone (Methyl Ethyl Ketone)	-	-	<5	-	-	-	-	-	-
2-Hexanone	-	-	<5	-	-	-	-	-	-
Bromodichloromethane	-	-	<0.1	-	-	-	-	-	-
Bromomethane (Methyl Bromide)	-	-	<0.8	-	-	-	-	-	-
Chlorobenzene	250	120[9]	<0.1	-	-	-	-	-	-
Chloroethane	-	-	<0.4	-	-	-	-	-	-
Dibromochloromethane	-	-	<0.1	-	-	-	-	-	-
Dichlorodifluoromethane	-	-	<0.2	-	-	-	-	-	-
Dichloromethane (Methylene Chloride)	-	980[8]	<6	-	-	-	-	-	-
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	-	-	<2	-	-	-	-	-	-
Methylene Bromide (Dibromomethane)	-	-	<0.2	-	-	-	-	-	-
Monochloromethane (Methyl chloride)	-	-	<0.4	-	-	-	-	-	-
Tetrachloroethylene (PERC)	-	1100[8]	<0.1	-	-	-	-	-	-
Tetrachloromethane (Carbon tetrachloride)	-	130[8]	<0.1	-	-	-	-	-	-
Tribromomethane (Bromoform)	-	-	<0.2	-	-	-	-	-	-
Trichloroethylene (TCE)	-	200[8]	<0.1	-	-	-	-	-	-
Trichlorofluoromethane	-	-	<0.2	-	-	-	-	-	-
Trichloromethane (Chloroform)	-	20[8]	<0.3	-	-	-	-	-	-
Vinyl Chloride	-	-	<0.2	-	-	-	-	-	-
Phenols, Chlorinated									
2,3,4-Trichlorophenol	-	2.5-320[10]	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1
2,3,5-Trichlorophenol	-	2.5-340[10]	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1
2,3,6-Trichlorophenol	-	8-1080[10]	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1
2,4,5-Trichlorophenol	-	2.5-300[10]	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1
2,4,6-Trichlorophenol	-	6-800[10]	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1
3,4,5-Trichlorophenol	-	1-128[10]	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1
Trichlorophenols	-	1-128[10]	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1
2,3,4,5-Tetrachlorophenol	-	2-260[10]	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05
2,3,4,6-Tetrachlorophenol	-	5.5-720[10]	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05
Tetrachlorophenols	-	2-260[10]	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05
Pentachlorophenol	-	1-110[10]	<0.05	<0.05	-	<0.05	0.3	<0.05	<0.05
Total Chlorinated Phenols	-	1-110[10]	<0.05	<0.05	-	<0.05	0.3	<0.05	<0.05

Table 6: Notes
Groundwater Analytical Results
Fraser River Port Authority
Phase 2 ESA
Brownsville Site, Surrey, BC

(1) All values are reported as µg/L unless otherwise noted
(2) - = No standard or Not analyzed or Not calculated
(3) CCME = Canadian Council of Ministers of the Environment, Canadian Environmental Quality Guidelines, 1999, updated to January 2006
(4) CCME MALx10 = Chapter 4, Canadian Water Quality Guidelines for the Protection of Aquatic Life, Summary Table, Marine, Update 7.0, September 2007; all values multiplied by an assumed 10x dilution factor for groundwater entering surface water body
(5) CSR = BC Environmental Management Act, Contaminated Sites Regulation, B.C. Reg. 375/96, including amendments up to B.C. Reg. 239/2007, effective July 1, 2007
(6) CSR AW = Schedule 6, Column II Aquatic Life
(7) CCME MALx10 stipulates pH not < 7 and not > 8.7
(8) Schedule 6, Generic Numerical Water Standards
(9) Schedule 6, Generic Numerical Water Standards, Standard to protect marine and/or estuarine aquatic life (Schedule 6, Note 8)
(10) Chlorophenol standards vary with pH, temperature and substance isomer for CSR AW Schedule 6, Generic Numerical Water Standards; see Technical Guidance Document 9, Chlorophenol Aquatic Life Water Quality Standards; for samples missing pH and/or temperature data, the most stringent standard has been applied.

RPD = Relative percent difference (%)
RPD = Highlighted value exceeds the data quality objective

FIGURES



REGIONAL MAP

NAD83

NTS MAP 92G/2 (New Westminster)

HEMMERA

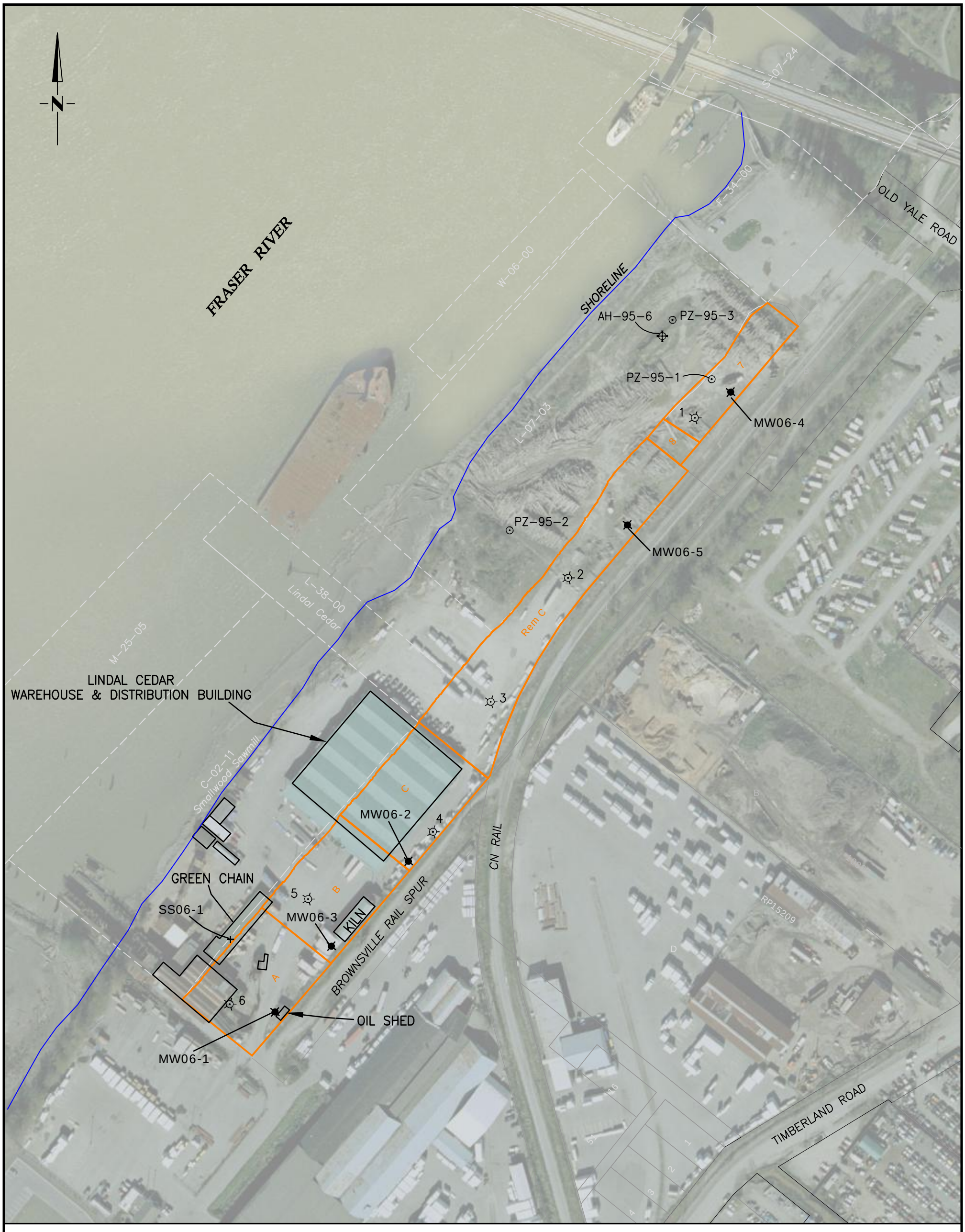
CLIENT: FRASER RIVER PORT AUTHORITY

PHASE 2 ENVIRONMENTAL SITE ASSESSMENT
BROWNSVILLE SITE, SURREY, BC

SITE LOCATION

PROJECT No.		
405-003.02	May 2008	FIGURE 1

405\003\02\



LEGEND

- ⊙ Piezometer Location (Klohn-Crippen, 1995)
- ⌖ Auger Test Hole Location (Klohn-Crippen, 1995)
- ⊙ Borehole Location (BC Research, 1991)
- ✦ Borehole/Monitoring Well Location (Hemmera, 2006)
- \+ Surface Soil Sample (Hemmera, 2006)
- Parcel & Property Boundaries
- B Parcel Number

SCALE 1:2000
metres
0 40 80

HEMMERA

CLIENT: FRASER RIVER PORT AUTHORITY

PHASE 2 ENVIRONMENTAL SITE ASSESSMENT
BROWNSVILLE SITE, SURREY, BC

SITE PLAN - INVESTIGATION LOCATIONS

PROJECT No.		
405-003.02	May 2008	FIGURE 2

FRASER RIVER

SHORELINE

OLD YALE ROAD

AH-95-6

PZ-95-3

PZ-95-1

MW06-4

PZ-95-2

MW06-5

MW06-2

MW06-3

KILN

SS06-1

GREEN CHAIN

LINDAL CEDAR
WAREHOUSE & DISTRIBUTION BUILDING

BROWNSVILLE RAIL SPUR

CN RAIL

OIL SHED

MW06-1

Soil Sample
MW06-2 (29/06/06)

Depth (m)	1.8-2.4
Parameter	Value
VPH (µg/L)	960

Groundwater Sample
MW06-2 (05/07/06)

Parameter	Value
VPH (µg/L)	2400
LEPH (µg/L)	2900

LEGEND

- Piezometer Location (Klohn-Crippen, 1995)
- Auger Test Hole Location (Klohn-Crippen, 1995)
- Borehole Location (BC Research, 1991)
- Borehole/Monitoring Well Location (Hemmera, 2006)
- Surface Soil Sample (Hemmera, 2006)
- Parcel & Property Boundaries
- B Parcel Number
- Sampling location with Concentration less than CSR IL Soil Standard and CCME IL Soil Guideline and less than CSR AW Groundwater Standard and CCME MAL guideline.
- Sampling Location with Concentration Exceeding CSR IL Soil Standard
- Sampling Location with Concentration Exceeding CSR AW Groundwater Standard
- Concentration Exceeds CSR IL Soil Standard
- Concentration Exceeds CSR AW Groundwater Standard

SCALE 1:2000
metres
0 40 80

HEMMERA

CLIENT: FRASER RIVER PORT AUTHORITY

PHASE 2 ENVIRONMENTAL SITE ASSESSMENT
BROWNSVILLE SITE, SURREY, BC

GROUNDWATER & SOIL EXCEEDANCES

PROJECT No.	405-003.02	May 2008	FIGURE 3

APPENDIX A
Borehole/Monitoring Well Logs

Log of Monitoring Well: MW06-1

HEMMERA

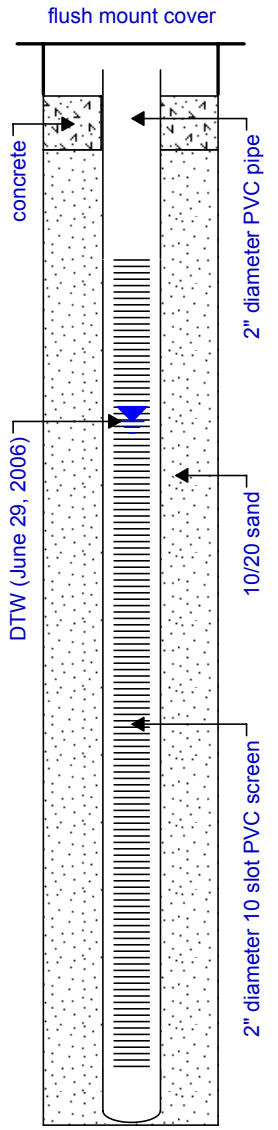
Project: Brownsville Phase II
Project No.: 405-003.02
Client: Fraser River Port Authority
Location: Surrey, BC
Elevation of Ground Surface: 99.80

Date Drilled: 06/29/2006
Drilling Company: BECK
Drilling Method: Solid Stem
Logged By: Seth Kingsbury
Elevation of Top of Pipe: 99.72

SUBSURFACE PROFILE | **SAMPLE**

Depth (ft / m)	Description	Depth/Elev.	Sample ID	Type	Vapour (ppm)
	Ground Surface	99.8			
0 / 0	***FILL (Sand and Gravel)*** some peat, dark grey, compact, poorly graded, dry, odour present, staining at surface	0.0 / 99.6	1	G	50
0.7 / 0.2	***FILL (Concrete Slab)*** potential former building slab	0.2 / 99.5			
1 / 0.3	***SAND*** medium to fine grained, trace silt, dark grey, loose, poorly graded, moist, odour present, no obvious staining)	0.3 / 98.9	2*		320
3 / 0.9	***PEAT*** some sand, medium to fine grained, trace silt, dark brown, loose, poorly graded, moist to wet, odour present, no staining, water encountered at 1.22m	0.9 / 98.3	3		12%
5 / 1.5	***SILT*** trace sand and clay, dark brown, medium stiff, poorly graded, wet, odour present, no staining	1.5 / 97.4	4		180
8 / 2.4		2.4 / 96.8	5*		180
10 / 3.0	End of Log	3.0			

Well Completion Details



* = submitted for analysis

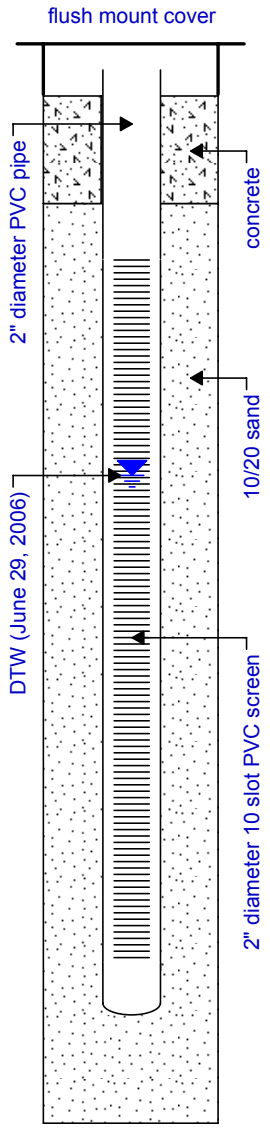
Log of Monitoring Well: MW06-2

HEMMERA

Project: Brownsville Phase II
Project No.: 405-003.02
Client: Fraser River Port Authority
Location: Surrey, BC
Elevation of Ground Surface: 99.48 m

Date Drilled: 06/29/2006
Drilling Company: BECK
Drilling Method: Solid Stem
Logged By: Seth Kingsbury
Elevation of Top of Pipe: 99.43 m

SUBSURFACE PROFILE				SAMPLE				
Depth (ft / m)	Symbol	Description	Depth/Elev.	Sample ID	Type	Vapour (ppm)	Depth (ft / m)	Well Completion Details
		Ground Surface	99.5					
		FILL (Asphalt)	0.0					
		FILL (Gravel)	99.3					
		road pack gravel	0.2					
1		***SAND*** medium to fine grained, trace silt, brown, loose, poorly graded, dry, no odour, no staining		1*		60	1	
			98.3					
		SILT trace sand and clay, dark grey, medium stiff, poorly graded, wet at 1.22m, odour present, no staining, trace wood fragments	1.2					
3				2		90	3	
5				3*		520	5	
7				4		320	7	
9			96.4				9	
11		End of Log	3.0				11	



* = submitted for analysis

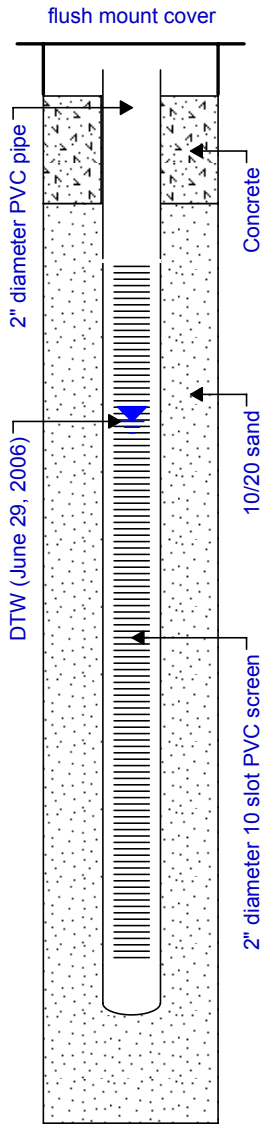
Log of Monitoring Well: MW06-3

HEMMERA

Project: Brownsville Phase II
Project No.: 405-003.02
Client: Fraser River Port Authority
Location: Surrey, BC
Elevation of Ground Surface: 99.53 m

Date Drilled: 06/29/2006
Drilling Company: BECK
Drilling Method: Solid Stem
Logged By: Seth Kingsbury
Elevation of Top of Pipe: 99.47 m

SUBSURFACE PROFILE				SAMPLE				
Depth (ft / m)	Symbol	Description	Depth/Elev.	Sample ID	Type	Vapour (ppm)	Depth (ft / m)	Well Completion Details
		Ground Surface	99.5					
		FILL (Concrete) concrete slab	0.0 99.3					
		SAND medium to fine grained, trace silt, dark grey, loose, poorly graded, moist, no odour, no staining	0.2	1*		60		
			98.5					
		PEAT some sand, medium to fine grained, trace silt, dark brown, loose, poorly graded, moist to wet, odour present, no staining, some wood chips/fragments encountered	1.1 98.0	2		90		
		SILT trace clay and sand, dark grey, medium stiff, poorly graded, wet, no odor, no staining, trace peat and wood chips/fragments until 1.98m	1.5	3*		520		
				4		320		
		End of Log	96.5 3.0					



* = submitted for analysis

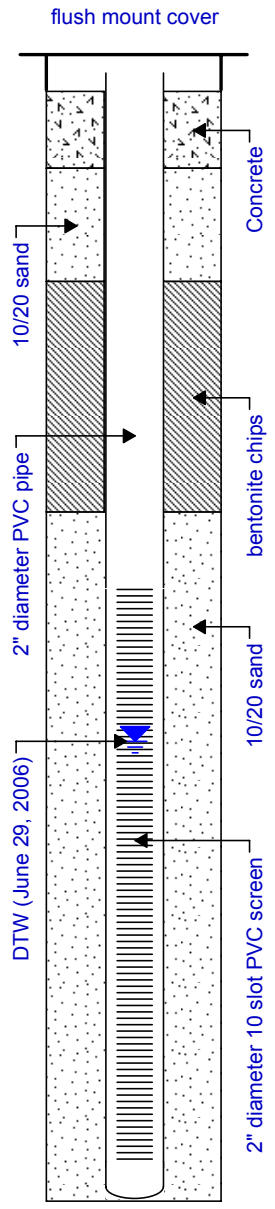
Log of Monitoring Well: MW06-4

HEMMERA

Project: Brownsville Phase II
Project No.: 405-003.02
Client: Fraser River Port Authority
Location: Surrey, BC
Elevation of Ground Surface: 100.30 m

Date Drilled: 06/29/2006
Drilling Company: BECK
Drilling Method: Solid Stem
Logged By: Seth Kingsbury
Elevation of Top of Pipe: 100.22 m

SUBSURFACE PROFILE				SAMPLE				
Depth (ft / m)	Symbol	Description	Depth/Elev.	Sample ID	Type	Vapour (ppm)	Depth (ft / m)	Well Completion Details
		Ground Surface	100.3					
		SAND medium to fine grained, trace silt, dark grey, loose, poorly graded, dry, no odor, no staining, trace wood chips/fragments	0.0	1*		10		
				2		55		
			98.2					
		PEAT some sand, medium to fine grained, trace silt, dark brown, loose, poorly graded, moist, odour present, no staining, wood chips/fragments encountered	2.1	3		100		
			97.7					
		SILT trace sand and clay, dark grey, medium stiff, poorly graded, moist to wet, no odour, no staining, trace peat and wood fragments, water encountered at 2.74m	2.6	4*		25		
				5		25		
				6		20		
			95.7					
		End of Log	4.6					

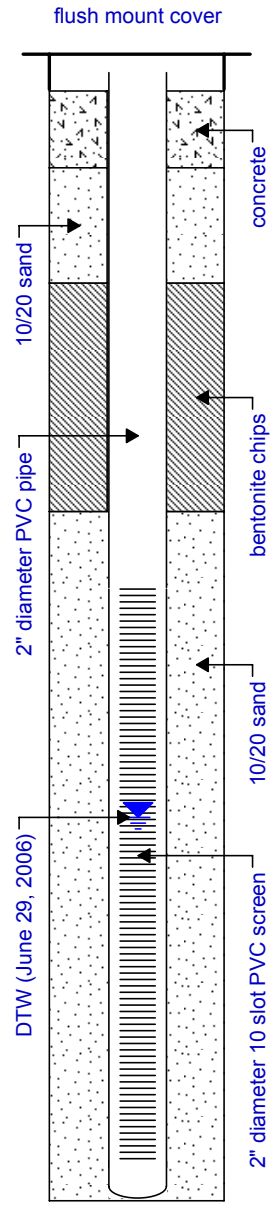


Log of Monitoring Well: MW06-5

Project: Brownsville Phase II
Project No.: 405-003.02
Client: Fraser River Port Authority
Location: Surrey, BC
Elevation of Ground Surface: 100.42 m

Date Drilled: 06/29/2006
Drilling Company: BECK
Drilling Method: Solid Stem
Logged By: Seth Kingsbury
Elevation of Top of Pipe: 100.32 m

SUBSURFACE PROFILE				SAMPLE				
Depth (ft / m)	Symbol	Description	Depth/Elev.	Sample ID	Type	Vapour (ppm)	Depth (ft / m)	Well Completion Details
		Ground Surface	100.4					
		SAND medium to fine grained, trace silt, dark grey, loose, poorly graded, dry, no odour, no staining, moist below 1.52m, trace wood chips/fragments	0.0	1*		10		
				2		20		
			98.9 1.5					
				3		50		
			98.3 2.1					
		PEAT some sand, medium to fine grained, trace silt, dark brown, loose, poorly graded, moist, odour present, no staining, wood chips/fragments encountered		4		125		
			98.0 2.4					
		SILT trace sand and clay, dark grey, medium stiff, poorly graded, moist to wet, no odour, no staining, trace peat and wood fragments, wet at 3.05m		5*		20		
				6		50		
			96.5 4.0					
				7		25		
			95.8 4.6					
		End of Log						



* = submitted for analysis

APPENDIX B
Laboratory Reports

Analysis Report

CANTEST LTD.

Professional
Analytical
Services

4606 Canada Way
Burnaby, B.C.
V5G 1K5

Fax: 604 731 2386

Tel: 604 734 7276

1 800 665 8566

REPORT ON: Analysis of Soil Samples

REPORTED TO: Hemmera Envirochem Inc.
250-1380 Burrard St
Vancouver, BC
V6Z 2H3

Att'n: Christiaan Iacoe

CHAIN OF CUSTODY: 197745, 197746, 197747
PROJECT NAME: Brownsville
PROJECT NUMBER: 405-003.02
P.O. NUMBER: 2477

NUMBER OF SAMPLES: 11

REPORT DATE: July 17, 2006

DATE SUBMITTED: June 30, 2006

GROUP NUMBER: 70706001

SAMPLE TYPE: Soil

NOTE: Results contained in this report refer only to the testing of samples as submitted. Other information is available on request.

TEST METHODS:

Volatile Hydrocarbons (VH) in Soil - analysis was performed using B.C. MOELP CSR-Analytical Method 1 "Volatile Hydrocarbons in Solids by GC/FID" approved August 12, 1999. The method involves methanol extraction and direct injection GC/FID analysis; components ranging from C6 to C10 are quantitated against m-xylene and 1,2,4-trimethylbenzene.

Volatile Petroleum Hydrocarbons (VPH) in Soil - results were obtained using B.C. MOELP CSR-Analytical Method Method 5 "Calculation of Volatile Petroleum Hydrocarbons in Solids or Water (VPH)" approved August 12, 1999. VPH is calculated by subtraction of specified MAH compounds from VH concentrations.

Moisture in Soil - analysis was performed gravimetrically by heating a separate sample portion at 105 C and measuring the weight loss.

pH in Soil or Solid - analysis was performed based on procedures described in the Manual on Soil Sampling and Methods of Analysis, published by the Canadian Society of Soil Science,1993. The test was performed using a deionized water leach with measurement by pH meter.

Extractable Petroleum Hydrocarbons in Water/Soil (LEPH/HEPH-GNS) - analysis was performed using a draft extraction-GC/FID procedure specified by the B.C. MOELP. Compounds eluting between n-decane (n-C10) and n-nonadecane (n-C19) are defined as Light Extractable Petroleum Hydrocarbons (LEPH). Compounds eluting between n-nonadecane and n-dotriacontane (n-C32) are defined as Heavy Extractable Petroleum Hydrocarbons (HEPH). The

(Continued)

CANTEST LTD.

Zhenyong Gao, M.Sc.
Coordinator, Trace Organics

Extractable Petroleum Hydrocarbons in Water/Soil (LEPH/HEPH-GNS)

results can be compared to Generic Numerical Standard (GNS) criteria. The report states if results were corrected for specified PAH's, & if silica gel cleanup was used.

Polynuclear Aromatic Hydrocarbons - analysis was performed using procedures based on U.S. EPA Methods 625/8270, involving extraction, clean-up steps, and analysis using GC/MS.

Chlorinated Phenols - analysis was performed using procedures based on U.S. EPA Methods 604/8040, involving extraction, derivatization, clean-up steps, and analysis using GC/ECD.

Mercury in Soil - analysis was performed using Cold Vapour Atomic Fluorescence.

Strong Acid Leachable Metals in Soil - analysis was performed using B.C. MOELP Method "Strong Acid Leachable Metals in Soil, Version 1.0". The method involves drying the sample at 60 C, sieving using a 2 mm (10 mesh) sieve and digestion using a mixture of hydrochloric and nitric acids. Analysis was performed using Inductively Coupled Argon Plasma Spectroscopy (ICAP) or by specific techniques as described.

Selenium in Soil - analysis was using Inductively Coupled Plasma Mass Spectrometry (ICP/MS).

Volatile Organic Compounds in Water and Soil - analysis was performed using procedures based on U.S. EPA Methods 624/8240/8260, involving sparging with a Purge and Trap apparatus and analysis using GC/MS.

TEST RESULTS:

(See following pages)

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706001

CANTEST®

Conventional Parameters in Soil

CLIENT SAMPLE IDENTIFICATION:	SAMPLE DATE	CANTEST ID	Moisture	pH
MW06-1-2	Jun 29/06	607060001	21.4	6.9
Dup-1	Jun 29/06	607060002	15.5	7.6
MW06-1-5	Jun 29/06	607060003	31.3	-
MW06-2-1	Jun 29/06	607060004	-	6.6
MW06-2-3	Jun 29/06	607060005	26.9	5.7
MW06-3-1	Jun 29/06	607060006	17.9	6.1
MW06-3-3	Jun 29/06	607060007	35.8	6.1
MW06-4-1	Jun 29/06	607060008	-	7.8
MW06-4-4	Jun 29/06	607060009	29.1	5.1
MW06-5-1	Jun 29/06	607060010	-	7.5
MW06-5-5	Jun 29/06	607060011	52.1	5.5
DETECTION LIMIT			0.1	0.1
UNITS			%	pH units

% = percent

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706001

CANTEST®

Polycyclic Aromatic Hydrocarbons in Soil

CLIENT SAMPLE IDENTIFICATION:	MW06-1-2	Dup-1	MW06-2-3	MW06-4-4	DETECTION LIMIT
DATE SAMPLED:	Jun 29/06	Jun 29/06	Jun 29/06	Jun 29/06	
CANTEST ID:	607060001	607060002	607060005	607060009	
ANALYSIS DATE:	Jul 11/06	Jul 11/06	Jul 11/06	Jul 11/06	
Naphthalene	0.24	0.07	< 0.5	<	0.05
2-Methylnaphthalene	0.12	0.18	< 0.5	<	0.05
Acenaphthylene	<	<	< 0.5	<	0.05
Acenaphthene	<	<	< 0.5	<	0.05
Fluorene	<	<	< 0.5	<	0.05
Phenanthrene	0.13	0.10	< 0.5	<	0.05
Anthracene	<	<	< 0.5	<	0.05
Total LMW-PAH's	0.49	0.35			
Fluoranthene	0.08	<	< 0.5	<	0.05
Pyrene	0.09	<	< 0.5	<	0.05
Benzo(a)anthracene	<	<	< 0.5	<	0.05
Chrysene	<	<	< 0.5	<	0.05
Benzo(b)fluoranthene	<	<	< 0.5	<	0.05
Benzo(k)fluoranthene	<	<	< 0.5	<	0.05
Benzo(a)pyrene	<	<	< 0.5	<	0.05
Indeno(1,2,3-cd)pyrene	<	<	< 0.5	<	0.05
Dibenz(a,h)anthracene	<	<	< 0.5	<	0.05
Benzo(g,h,i)perylene	<	<	< 0.5	<	0.05
Total HMW-PAH's	0.17				
Total PAH's	0.65	0.35			

Results expressed as micrograms per gram, on a dry weight basis. (μg/g)
< = Less than detection limit
Sample# 607060005 - Detection limits adjusted: Interference present in sample

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706001

CANTEST®

Polycyclic Aromatic Hydrocarbons in Soil

CLIENT SAMPLE IDENTIFICATION:	MW06-5-5	
DATE SAMPLED:	Jun 29/06	
CANTEST ID:	607060011	DETECTION LIMIT
ANALYSIS DATE:	Jul 11/06	
Naphthalene	0.12	0.05
2-Methylnaphthalene	<	0.05
Acenaphthylene	<	0.05
Acenaphthene	<	0.05
Fluorene	<	0.05
Phenanthrene	0.20	0.05
Anthracene	0.07	0.05
Total LMW-PAH's	0.39	
Fluoranthene	0.84	0.05
Pyrene	0.83	0.05
Benzo(a)anthracene	0.44	0.05
Chrysene	0.47	0.05
Benzo(b)fluoranthene	0.85	0.05
Benzo(k)fluoranthene	<	0.05
Benzo(a)pyrene	0.51	0.05
Indeno(1,2,3-cd)pyrene	0.34	0.05
Dibenz(a,h)anthracene	0.07	0.05
Benzo(g,h,i)perylene	0.30	0.05
Total HMW-PAH's	4.65	
Total PAH's	5.03	

Results expressed as micrograms per gram, on a dry weight basis. (μg/g)
< = Less than detection limit
NOTE: Benzo(b)fluoranthene and Benzo(k)fluoranthene reported as total.

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706001

CANTEST®

Volatile Organic Compounds in Soil

CLIENT SAMPLE IDENTIFICATION:	MW06-1-2	Dup-1	MW06-2-3	DETECTION LIMIT
DATE SAMPLED:	Jun 29/06	Jun 29/06	Jun 29/06	
CANTEST ID:	607060001	607060002	607060005	
ANALYSIS DATE:	Jul 7/06	Jul 7/06	Jul 7/06	
Benzene	<	<	<	0.03
Bromodichloromethane	<	<	<	0.03
Bromoform	<	<	<	0.03
Bromomethane	<	<	<	0.12
2-Butanone	<	<	<	1.5
Carbon Tetrachloride	<	<	<	0.03
Chlorobenzene	<	<	<	0.03
Chloroethane	<	<	<	0.06
Chloroform	<	<	<	0.03
Chloromethane	<	<	<	0.12
Dibromochloromethane	<	<	<	0.03
1,2-Dibromoethane	<	<	<	0.03
Dibromomethane	<	<	<	0.03
1,2-Dichlorobenzene	<	<	<	0.03
1,3-Dichlorobenzene	<	<	<	0.03
1,4-Dichlorobenzene	<	<	<	0.03
Dichlorodifluoromethane	<	<	<	0.06
1,1-Dichloroethane	<	<	<	0.03
1,2-Dichloroethane	<	<	<	0.06
1,1-Dichloroethene	<	<	<	0.03
cis-1,2-Dichloroethene	<	<	<	0.03
trans-1,2-Dichloroethene	<	<	<	0.03
1,2-Dichloropropane	<	<	<	0.03
cis-1,3-Dichloropropene	<	<	<	0.03
trans-1,3-Dichloropropene	<	<	<	0.03
Ethylbenzene	<	<	<	0.03
2-Hexanone	<	<	<	1.5
4-Methyl-2-pentanone	<	<	<	0.6
Methylene Chloride	<	<	<	0.9
Styrene	<	<	<	0.03
1,1,2,2-Tetrachloroethane	<	<	<	0.03

(Continued on next page)

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706001

CANTEST®

Volatile Organic Compounds in Soil

CLIENT SAMPLE IDENTIFICATION:	MW06-1-2	Dup-1	MW06-2-3	
DATE SAMPLED:	Jun 29/06	Jun 29/06	Jun 29/06	
CANTEST ID:	607060001	607060002	607060005	DETECTION LIMIT
ANALYSIS DATE:	Jul 7/06	Jul 7/06	Jul 7/06	
Tetrachloroethene	<	<	<	0.03
Toluene	0.26	0.18	<	0.03
1,1,1-Trichloroethane	<	<	<	0.03
1,1,2-Trichloroethane	<	<	<	0.03
Trichloroethene	<	<	<	0.03
Trichlorofluoromethane	<	<	<	0.03
Vinyl Chloride	<	<	<	0.06
Xylenes	<	<	<	0.03
Surrogate Recovery				
1,2-Dichloroethane-d4	90	90	101	-
Toluene-d8	101	103	110	-
Bromofluorobenzene	90	93	80	-

Results expressed as micrograms per gram, on a dry weight basis. (μg/g)
Surrogate recoveries expressed as percent (%)
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706001

CANTEST®

Chlorinated Phenols in Soil

CLIENT SAMPLE IDENTIFICATION:	MW06-1-2	Dup-1	MW06-2-3	MW06-3-1	
DATE SAMPLED:	Jun 29/06	Jun 29/06	Jun 29/06	Jun 29/06	DETECTION LIMIT
CANTEST ID:	607060001	607060002	607060005	607060006	
Pentachlorophenol	<	<	<	<	0.005
2,3,4-Trichlorophenol	<	<	<	<	0.01
2,3,5-Trichlorophenol	<	<	<	<	0.01
2,3,6-Trichlorophenol	<	<	<	<	0.01
2,4,5-Trichlorophenol	<	<	<	<	0.01
2,4,6-Trichlorophenol	<	<	<	<	0.01
3,4,5-Trichlorophenol	<	<	<	<	0.01
2,3,4,5-Tetrachlorophenol	<	<	<	<	0.005
2,3,4,6-Tetrachlorophenol	<	<	<	<	0.005
Total Trichlorophenols	<	<	<	<	0.01
Total Tetrachlorophenols	<	<	<	<	0.005
Total Chlorinated Phenols	<	<	<	<	0.005
Surrogate Recovery					
2,4,6-Tribromophenol	70	69	76	75	-

Results expressed as micrograms per gram, on a dry weight basis. (µg/g)
Surrogate recoveries expressed as percent (%)
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706001

CANTEST®

Chlorinated Phenols in Soil

CLIENT SAMPLE IDENTIFICATION:	MW06-3-3	MW06-4-4	MW06-5-5	
DATE SAMPLED:	Jun 29/06	Jun 29/06	Jun 29/06	DETECTION LIMIT
CANTEST ID:	607060007	607060009	607060011	
Pentachlorophenol	<	<	<	0.005
2,3,4-Trichlorophenol	<	<	<	0.01
2,3,5-Trichlorophenol	<	<	<	0.01
2,3,6-Trichlorophenol	<	<	<	0.01
2,4,5-Trichlorophenol	<	<	<	0.01
2,4,6-Trichlorophenol	<	<	<	0.01
3,4,5-Trichlorophenol	<	<	<	0.01
2,3,4,5-Tetrachlorophenol	<	<	<	0.005
2,3,4,6-Tetrachlorophenol	<	<	<	0.005
Total Trichlorophenols	<	<	<	0.01
Total Tetrachlorophenols	<	<	<	0.005
Total Chlorinated Phenols	<	<	<	0.005
Surrogate Recovery				
2,4,6-Tribromophenol	80	78	73	-

Results expressed as micrograms per gram, on a dry weight basis. (µg/g)
Surrogate recoveries expressed as percent (%)
< = Less than detection limit

CANTEST®

Monocyclic Aromatic Hydrocarbons-Methanol Extraction- in Soil

CLIENT SAMPLE IDENTIFICATION:	SAMPLE DATE	CANTEST ID	Volatile Hydrocarbons VHs6-10	VPHs
MW06-1-2	Jun 29/06	607060001	<	<
Dup-1	Jun 29/06	607060002	<	<
MW06-2-3	Jun 29/06	607060005	960	960
DETECTION LIMIT			100	100
UNITS			µg/g	µg/g

µg/g = micrograms per gram, on a dry weight basis.
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706001

CANTEST®

Strong Acid Soluble Metals in Soil

CLIENT SAMPLE IDENTIFICATION:		MW06-1-2	Dup-1	MW06-2-1	MW06-3-1	
DATE SAMPLED:		Jun 29/06	Jun 29/06	Jun 29/06	Jun 29/06	DETECTION LIMIT
CANTEST ID:		607060001	607060002	607060004	607060006	
Antimony	Sb	755	<	<	<	10
Arsenic	As	23	<	<	<	10
Barium	Ba	71	65	59	71	1
Beryllium	Be	<	<	<	<	1
Cadmium	Cd	<	<	<	<	0.5
Chromium	Cr	31	29	45	35	2
Cobalt	Co	11	11	17	11	1
Copper	Cu	41	21	20	22	1
Lead	Pb	4370	6	390	6	5
Mercury	Hg	0.02	0.02	0.02	0.03	0.01
Molybdenum	Mo	<	<	<	<	4
Nickel	Ni	41	39	41	40	2
Selenium	Se	0.2	<	<	0.2	0.2
Silver	Ag	<	<	<	<	2
Tin	Sn	617	<	<	<	5
Vanadium	V	37	36	42	37	1
Zinc	Zn	50	48	99	53	1
Aluminum	Al	11400	11300	10600	11200	10
Boron	B	2	2	2	1	1
Calcium	Ca	4610	4580	3890	3710	1
Iron	Fe	18100	17800	20200	17700	2
Magnesium	Mg	7930	7770	7680	7530	0.1
Manganese	Mn	373	393	251	246	1
Phosphorus	P	458	466	503	486	20
Potassium	K	588	625	511	583	10
Sodium	Na	210	237	171	177	5
Strontium	Sr	27	27	19	23	1
Titanium	Ti	593	561	578	572	1
Zirconium	Zr	5	4	4	5	1

Results expressed as micrograms per gram, on a dry weight basis. (μg/g)
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706001

CANTEST

Strong Acid Soluble Metals in Soil

CLIENT SAMPLE IDENTIFICATION:		MW06-4-1	MW06-5-1	
DATE SAMPLED:		Jun 29/06	Jun 29/06	DETECTION LIMIT
CANTEST ID:		607060008	607060010	
Antimony	Sb	<	<	10
Arsenic	As	<	<	10
Barium	Ba	66	73	1
Beryllium	Be	<	<	1
Cadmium	Cd	<	<	0.5
Chromium	Cr	36	36	2
Cobalt	Co	12	13	1
Copper	Cu	22	23	1
Lead	Pb	7	6	5
Mercury	Hg	0.03	0.03	0.01
Molybdenum	Mo	<	<	4
Nickel	Ni	42	45	2
Selenium	Se	<	0.2	0.2
Silver	Ag	<	<	2
Tin	Sn	<	<	5
Vanadium	V	43	40	1
Zinc	Zn	54	56	1
Aluminum	Al	11400	11900	10
Boron	B	2	2	1
Calcium	Ca	6620	7640	1
Iron	Fe	19600	19500	2
Magnesium	Mg	8460	8970	0.1
Manganese	Mn	368	390	1
Phosphorus	P	578	542	20
Potassium	K	557	578	10
Sodium	Na	187	192	5
Strontium	Sr	31	34	1
Titanium	Ti	545	567	1
Zirconium	Zr	4	5	1

Results expressed as micrograms per gram, on a dry weight basis. (μg/g)
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706001

CANTEST®

Extractable Petroleum Hydrocarbons - Silica-gel Cleanup in Soil

CLIENT SAMPLE IDENTIFICATION:	SAMPLE DATE	CANTEST ID	EPHs10-19 (Silica-gel treated)	EPHs19-32 (Silica-gel treated)
MW06-1-2	Jun 29/06	607060001	<	<
Dup-1	Jun 29/06	607060002	<	<
MW06-1-5	Jun 29/06	607060003	<	<
MW06-2-3	Jun 29/06	607060005	970	<
MW06-3-1	Jun 29/06	607060006	<	<
MW06-3-3	Jun 29/06	607060007	<	<
MW06-4-4	Jun 29/06	607060009	<	<
MW06-5-5	Jun 29/06	607060011	<	<
DETECTION LIMIT			250	250
UNITS			µg/g	µg/g

µg/g = micrograms per gram, on a dry weight basis.
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706001

CANTEST®

EPH - PAH Corrected with Silica-gel Cleanup in Soil

CLIENT SAMPLE IDENTIFICATION:	SAMPLE DATE	CANTEST ID	LEPH (w/Si-gel) corr. for PAH	HEPH (w/Si-gel) corr. for PAH
MW06-1-2	Jun 29/06	607060001	<	<
Dup-1	Jun 29/06	607060002	<	<
MW06-2-3	Jun 29/06	607060005	970	<
MW06-4-4	Jun 29/06	607060009	<	<
MW06-5-5	Jun 29/06	607060011	<	<
DETECTION LIMIT			250	250
UNITS			µg/g	µg/g

µg/g = micrograms per gram, on a dry weight basis.
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706001

Batch Quality Control for Monocyclic Aromatic Hydrocarbons-Methanol Extraction- in Soil (QC# 83161)

Parameter	Blank (ug/g)	Blank Limits
Volatile Hydrocarbons VHs6-10	< 100	100

ug/g = micrograms per gram

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706001

CANTEST®

Batch Quality Control for Polycyclic Aromatic Hydrocarbons in Soil (QC# 83206)

Parameter	Blank (ug/g)	Blank Limits	Duplicate (R.P.D.) 607080105	Duplicate Limits	NRC HS-5 Cert. Ref. Material (% Recovery)	NRC HS-5 Cert. Ref. Material Limits
Naphthalene	< 0.05	0.05	NC	40	88	57 - 111
Acenaphthylene	< 0.05	0.05	NC	40	87	45 - 135
Acenaphthene	< 0.05	0.05	NC	40	-	-
Fluorene	< 0.05	0.05	NC	40	-	-
Phenanthrene	< 0.05	0.05	NC	40	67	49 - 97
Anthracene	< 0.05	0.05	NC	40	79	54 - 129
Fluoranthene	< 0.05	0.05	NC	40	74	59 - 124
Pyrene	< 0.05	0.05	NC	40	59	46 - 84
Benzo(a)anthracene	< 0.05	0.05	NC	40	-	-
Chrysene	< 0.05	0.05	NC	40	79	53 - 114
Benzo(b)fluoranthene	< 0.05	0.05	NC	40	-	-
Benzo(a)pyrene	< 0.05	0.05	NC	40	-	-
Indeno(1,2,3-cd)pyrene	< 0.05	0.05	NC	40	57	49 - 102
Dibenz(a,h)anthracene	< 0.05	0.05	NC	40	80	61 - 126
Benzo(g,h,i)perylene	< 0.05	0.05	NC	40	-	-

ug/g = micrograms per gram
R.P.D. = Relative Percent Difference
NC = Not Calculated. Duplicate sample results were less than the detection limit. Relative Percent Difference calculation is not defined for analyte levels of less than detection limit.

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706001

CANTEST®

Batch Quality Control for Chlorinated Phenols in Soil (QC# 83373)

Parameter	Blank (ug/g)	Blank Limits	Duplicate (R.P.D.) 607060005	Duplicate Limits	Spike (% Recovery)	Spike Limits
Pentachlorophenol	< 0.005	0.005	NC	25	102	49 - 150
2,3,4-Trichlorophenol	< 0.01	0.01	NC	25	86	57 - 135
2,3,5-Trichlorophenol	< 0.01	0.01	NC	25	92	60 - 132
2,3,6-Trichlorophenol	< 0.01	0.01	NC	25	84	60 - 120
2,4,5-Trichlorophenol	< 0.01	0.01	NC	25	91	45 - 147
2,4,6-Trichlorophenol	< 0.01	0.01	NC	25	81	49 - 130
3,4,5-Trichlorophenol	< 0.01	0.01	NC	25	95	52 - 138
2,3,4,5-Tetrachlorophenol	< 0.005	0.005	NC	25	96	53 - 132
2,3,4,6-Tetrachlorophenol	< 0.005	0.005	NC	25	97	53 - 133

ug/g = micrograms per gram
R.P.D. = Relative Percent Difference
NC = Not Calculated. Duplicate sample results were less than the detection limit. Relative Percent Difference calculation is not defined for analyte levels of less than detection limit.

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706001

CANTEST®

Batch Quality Control for Strong Acid Soluble Metals in Soil (QC# 83157)

Parameter		Blank (ug/g)	Blank Limits	CAN MET Till-1 (% Recovery)	CAN MET Till-1 Limits	Duplicate (R.P.D.) 607060006	Duplicate Limits
Antimony	Sb	-	-	-	-	NC	30
Arsenic	As	< 10	10	138	77 - 146	NC	30
Barium	Ba	< 1	1	-	-	2.8	30
Beryllium	Be	-	-	-	-	NC	30
Chromium	Cr	-	-	-	-	2.9	30
Cobalt	Co	-	-	-	-	8.7	30
Copper	Cu	< 1	1	-	-	4.4	30
Lead	Pb	< 5	5	150	65 - 171	NC	30
Mercury	Hg	< 0.01	0.001	87	33 - 174	0	30
Molybdenum	Mo	-	-	-	-	NC	30
Nickel	Ni	< 2	2	111	49 - 149	5	30
Selenium	Se	< 0.2	0.2	-	-	NC	30
Tin	Sn	-	-	-	-	NC	30
Vanadium	V	-	-	-	-	8	30
Zinc	Zn	< 1	1	-	-	3.8	30
Calcium	Ca	-	-	81	51 - 106	-	-
Iron	Fe	-	-	110	74 - 139	-	-
Manganese	Mn	-	-	132	92 - 138	-	-

ug/g = micrograms per gram
R.P.D. = Relative Percent Difference
NC = Not Calculated. Duplicate sample results were less than the detection limit. Relative Percent Difference calculation is not defined for analyte levels of less than detection limit.

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706001

CANTEST®

Batch Quality Control for Strong Acid Soluble Metals in Soil (QC# 83157)

Parameter		Duplicate (R.P.D.) 607060022	Duplicate Limits	Duplicate (R.P.D.) 607060039	Duplicate Limits	Duplicate (R.P.D.) 607060221	Duplicate Limits
Antimony	Sb	NC	30	NC	30	NC	30
Arsenic	As	NC	30	NC	30	NC	30
Barium	Ba	11.5	30	0	30	14.6	30
Beryllium	Be	NC	30	NC	30	NC	30
Chromium	Cr	13.8	30	0	30	5.4	30
Cobalt	Co	0	30	0	30	7.4	30
Copper	Cu	0	30	4.7	30	7.4	30
Lead	Pb	NC	30	PASS	30	(*)	30
Mercury	Hg	0	30	0	30	0	30
Molybdenum	Mo	NC	30	NC	30	NC	30
Nickel	Ni	5	30	0	30	3	30
Selenium	Se	NC	30	NC	30	PASS	30
Tin	Sn	NC	30	NC	30	19.6	30
Vanadium	V	5	30	2.7	30	3.4	30
Zinc	Zn	2.3	30	12.7	30	18.6	30

ug/g = micrograms per gram
R.P.D. = Relative Percent Difference
PASS = Duplicate sample results were in the range of one to five times the detection limit. R.P.D. calculation is not applicable in this range. Acceptance criteria is a maximum difference between the duplicates equivalent to the value of the detection limit.
NC = Not Calculated. Duplicate sample results were less than the detection limit. Relative Percent Difference calculation is not defined for analyte levels of less than detection limit.
(*) = Quality Control results exceeded internally set limits; after review by Quality Assurance Unit, non-conformance overridden and batch sample analysis results released for reporting

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Batch Quality Control for Strong Acid Soluble Metals in Soil (QC# 83157)

Parameter		Duplicate (R.P.D.) 607060477	Duplicate Limits
Antimony	Sb	NC	30
Arsenic	As	NC	30
Barium	Ba	1.6	30
Beryllium	Be	NC	30
Chromium	Cr	4.4	30
Cobalt	Co	0	30
Copper	Cu	5.1	30
Lead	Pb	PASS	30
Mercury	Hg	0	30
Molybdenum	Mo	NC	30
Nickel	Ni	0	30
Selenium	Se	NC	30
Tin	Sn	NC	30
Vanadium	V	4.1	30
Zinc	Zn	4.7	30

ug/g = micrograms per gram
R.P.D. = Relative Percent Difference
PASS = Duplicate sample results were in the range of one to five times the detection limit. R.P.D. calculation is not applicable in this range. Acceptance criteria is a maximum difference between the duplicates equivalent to the value of the detection limit.
NC = Not Calculated. Duplicate sample results were less than the detection limit. Relative Percent Difference calculation is not defined for analyte levels of less than detection limit.

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Batch Quality Control for Volatile Organic Compounds in Soil (QC# 83318)

Parameter	Duplicate (R.P.D.) 607080125	Duplicate Limits
Benzene	NC	20
Bromodichloromethane	NC	20
Bromoform	NC	20
Carbon Tetrachloride	NC	20
Chlorobenzene	NC	20
Chloroform	NC	20
Dibromochloromethane	NC	20
1,2-Dibromoethane	NC	20
Dibromomethane	NC	20
1,2-Dichlorobenzene	NC	20
1,3-Dichlorobenzene	NC	20
1,4-Dichlorobenzene	NC	20
1,1-Dichloroethane	NC	20
1,2-Dichloroethane	NC	20
1,1-Dichloroethene	NC	20
cis-1,2-Dichloroethene	NC	20
trans-1,2-Dichloroethene	NC	20
1,2-Dichloropropane	NC	20
cis-1,3-Dichloropropene	NC	20
trans-1,3-Dichloropropene	NC	20
Ethylbenzene	NC	20
Styrene	NC	20
1,1,2,2-Tetrachloroethane	NC	20
Tetrachloroethene	NC	20
Toluene	NC	20
1,1,1-Trichloroethane	NC	20
1,1,2-Trichloroethane	NC	20
Trichloroethene	NC	20
Trichlorofluoromethane	NC	20
Xylenes	NC	20

ug/g = micrograms per gram
R.P.D. = Relative Percent Difference
NC = Not Calculated. Duplicate sample results were less than the detection limit. Relative Percent Difference calculation is not defined for analyte levels of less than detection limit.

Batch Quality Control Frequency Summary

EPH (LEPH/HEPH)- Soil Prep (Batch# 83124)

QC Type	No. Samples
Blank	1
Cert Ref Material RTC CRM355	1
Duplicate	1
Method Performance Check Spike	1

SALM in Soil Digestion (Batch# 83157)

QC Type	No. Samples
CAN MET Till-1	1
Blank	3
Duplicate	5

MeOH Extr'n Prep BTEX/VPH Soil (Batch# 83161)

QC Type	No. Samples
Blank	1
Method Performance Check Spike	1

PAH's in Soil Sample Prep (Batch# 83206)

QC Type	No. Samples
Blank	1
Duplicate	1
NRC HS-5 Cert. Ref. Material	1

Volatiles Analysis (Batch# 83318)

QC Type	No. Samples
Duplicate	1
Volatiles Soil Spike	1

(Continued on next page)

Batch Quality Control Frequency Summary

PCP Soil Preparation (Batch# 83373)

QC Type	No. Samples
Blank	1
Duplicate	1
Spike	1

EPH (LEPH/HEPH)- Soil Prep (Batch# 83124)

QC Type	No. Samples
Batch Size	19

SALM Metals in Soil Sieve (Batch# 83141)

QC Type	No. Samples
Batch Size	47

SALM in Soil Digestion (Batch# 83157)

QC Type	No. Samples
Batch Size	51

MeOH Extr'n Prep BTEX/VPH Soil (Batch# 83161)

QC Type	No. Samples
Batch Size	48

(Continued on next page)

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Batch Quality Control Frequency Summary

PAH's in Soil Sample Prep (Batch# 83206)

QC Type	No. Samples
Batch Size	19

Volatiles Analysis (Batch# 83318)

QC Type	No. Samples
Batch Size	35

PCP Soil Preparation (Batch# 83373)

QC Type	No. Samples
Batch Size	8

Analysis Report

CANTEST LTD.

Professional
Analytical
Services

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1 800 665 8566

REPORT ON: Analysis of Water Samples

REPORTED TO: Hemmera Envirochem Inc.
250-1380 Burrard St
Vancouver, BC
V6Z 2H3

Att'n: Christiaan Iacoe

CHAIN OF CUSTODY: 142434
PROJECT NAME: Brownsville
PROJECT NUMBER: 405-003.02
P.O. NUMBER: 2479

NUMBER OF SAMPLES: 6

REPORT DATE: July 17, 2006

DATE SUBMITTED: July 5, 2006

GROUP NUMBER: 70706017

SAMPLE TYPE: Water

NOTE: Results contained in this report refer only to the testing of samples as submitted. Other information is available on request.

TEST METHODS:

Volatile Organic Compounds in Water and Soil - analysis was performed using procedures based on U.S. EPA Methods 624/8240/8260, involving sparging with a Purge and Trap apparatus and analysis using GC/MS.

Volatile Hydrocarbons (VH) and Volatile Petroleum Hydrocarbons (VPH) in Water - analysis was performed using B.C. MOELP CSR-Analytical Method 2 "Volatile Hydrocarbons in Water by GC/FID" and CSR-Analytical Method 5 "Calculation of Volatile Petroleum Hydrocarbons in Solids or Water (VPH)" approved August 12, 1999. The method involves sparging/collection using a Purge & Trap apparatus with GC/MS analysis; VH components ranging from C6 to C10 are quantified against m-xylene and 1,2,4-trimethylbenzene. VPH is calculated by subtraction of specified MAH compounds from VH concentrations.

Conventional Parameters - analyses were performed using procedures based on those described in "British Columbia Environmental Laboratory Manual For the Analysis of Water, Wastewater, Sediment and Biological Materials" (1994 Edition), Province of British Columbia and "Standard Methods for the Examination of Water and Wastewater" 20th Edition, (1998), published by the American Public Health Association.

Extractable Petroleum Hydrocarbons and Light and Heavy Extractable Petroleum Hydrocarbons in Water - analysis was performed using B.C. MOELP CSR-Analytical Method 4 "Extractable Petroleum Hydrocarbons in Water by GC/FID" and CSR-Analytical Method 6 "Calculation of Light and Heavy Extractable Petroleum Hydrocarbons in Solids or Water (LEPH & HEPH)". The method involves DCM extraction and GC/FID analysis. EPH components ranging from C10 to C19 and C19 to C32 are quantified against eicosane (n-C20). LEPH & HEPH are calculated by subtraction of specified

(Continued)

CANTEST LTD.

Zhenyong Gao, M.Sc.
Coordinator, Trace Organics

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706017

Extractable Petroleum Hydrocarbons and Light and Heavy Extractable Petroleum Hydrocarbons in Water

PAH's.

Mercury in Water - analysis was performed using procedures based on U. S. EPA Method 245.7, oxidative digestion using bromination, and analysis using Cold Vapour Atomic Fluorescence Spectroscopy.

Dissolved Metals in Water - Samples were filtered in the laboratory and quantitatively determined using Inductively Coupled Plasma Optical Emission Spectroscopy (ICP) and/or Inductively Coupled Plasma-Mass Spectroscopy (ICP/MS).

Polynuclear Aromatic Hydrocarbons - analysis was performed using procedures based on U.S. EPA Methods 625/8270, involving extraction, clean-up steps, and analysis using GC/MS.

Chlorinated Phenols - analysis was performed using procedures based on U.S. EPA Methods 604/8040, involving extraction, derivatization, clean-up steps, and analysis using GC/ECD.

pH in Water - was determined based on Method 4500-H in Standard Methods (20th Edition) and Method X330 in the BC Laboratory Manual (1994 Edition).

TEST RESULTS:

(See following pages)

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706017

Conventional Parameters in Water

CLIENT SAMPLE IDENTIFICATION:	SAMPLE DATE	CANTEST ID	Hardness CaCO3
MW06-1	Jul 5/06	607060079	60
MW06-2	Jul 5/06	607060082	234
MW06-3	Jul 5/06	607060084	147
MW06-4	Jul 5/06	607060088	194
MW06-5	Jul 5/06	607060093	145
Dup 05/07/06	Jul 5/06	607060095	64
DETECTION LIMIT			1
UNITS			mg/L

mg/L = milligrams per liter

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706017

CANTEST®

pH in Water

CLIENT SAMPLE IDENTIFICATION:	SAMPLE DATE	CANTEST ID	pH, Laboratory
MW06-1	Jul 5/06	607060079	6.20
MW06-2	Jul 5/06	607060082	6.30
MW06-3	Jul 5/06	607060084	6.20
MW06-4	Jul 5/06	607060088	5.80
MW06-5	Jul 5/06	607060093	5.90
Dup 05/07/06	Jul 5/06	607060095	6.00
DETECTION LIMIT			-
UNITS			pH units

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706017

CANTEST®

Metals Analysis in Water

CLIENT SAMPLE IDENTIFICATION:		MW06-1	MW06-2	MW06-3	MW06-4	DETECTION LIMIT	UNITS
SAMPLE PREPARATION:		DISSOLVED	DISSOLVED	DISSOLVED	DISSOLVED		
DATE SAMPLED:		Jul 5/06	Jul 5/06	Jul 5/06	Jul 5/06		
CANTEST ID:		607060079	607060082	607060084	607060088		
Aluminum	Al	0.032	<	0.007	<	0.005	mg/L
Antimony	Sb	<	<	<	<	0.001	mg/L
Arsenic	As	0.022	0.002	0.003	<	0.001	mg/L
Barium	Ba	0.040	0.12	0.051	0.16	0.001	mg/L
Beryllium	Be	<	<	<	<	0.001	mg/L
Bismuth	Bi	<	<	<	<	0.001	mg/L
Boron	B	0.07	<	<	<	0.05	mg/L
Cadmium	Cd	<	<	<	<	0.0002	mg/L
Calcium	Ca	17.5	69.2	46.6	53.9	0.05	mg/L
Chromium	Cr	0.001	<	<	<	0.001	mg/L
Cobalt	Co	0.001	0.029	0.004	0.036	0.001	mg/L
Copper	Cu	0.001	<	<	<	0.001	mg/L
Iron	Fe	13.3	1.72	0.72	4.85	0.05	mg/L
Lead	Pb	<	<	<	<	0.001	mg/L
Lithium	Li	0.002	0.001	0.001	0.003	0.001	mg/L
Magnesium	Mg	3.91	14.8	7.31	14.5	0.05	mg/L
Manganese	Mn	0.70	3.75	1.01	1.99	0.001	mg/L
Mercury	Hg	<	<	<	<	0.02	µg/L
Molybdenum	Mo	0.0010	0.0016	0.0013	0.0005	0.0005	mg/L
Nickel	Ni	0.003	0.049	0.008	0.071	0.001	mg/L
Phosphorus	P	<	<	<	<	0.15	mg/L
Potassium	K	2.8	2.8	4.4	5.4	0.1	mg/L
Selenium	Se	<	<	<	<	0.001	mg/L
Silicon	Si	11.9	7.6	13.7	12.4	0.25	mg/L
Silver	Ag	<	<	<	<	0.00025	mg/L
Sodium	Na	4.79	17.9	8.80	10.0	0.05	mg/L
Strontium	Sr	0.075	0.32	0.11	0.25	0.001	mg/L
Tellurium	Te	<	<	<	<	0.001	mg/L
Thallium	Tl	<	<	<	0.0001	0.0001	mg/L
Thorium	Th	<	<	<	<	0.0005	mg/L
Tin	Sn	<	<	<	<	0.001	mg/L

(Continued on next page)

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706017

CANTEST®

Metals Analysis in Water

CLIENT SAMPLE IDENTIFICATION:		MW06-1	MW06-2	MW06-3	MW06-4	DETECTION LIMIT	UNITS
SAMPLE PREPARATION:		DISSOLVED	DISSOLVED	DISSOLVED	DISSOLVED		
DATE SAMPLED:		Jul 5/06	Jul 5/06	Jul 5/06	Jul 5/06		
CANTEST ID:		607060079	607060082	607060084	607060088		
Titanium	Ti	0.008	<	0.001	<	0.001	mg/L
Uranium	U	<	0.0010	<	0.0006	0.0005	mg/L
Vanadium	V	0.003	<	<	<	0.001	mg/L
Zinc	Zn	0.024	0.013	0.007	0.022	0.005	mg/L
Zirconium	Zr	<	<	<	<	0.01	mg/L

mg/L = milligrams per liter
μg/L = micrograms per liter
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706017

CANTEST®

Metals Analysis in Water

CLIENT SAMPLE IDENTIFICATION:		MW06-5	Dup 05/07/06	DETECTION LIMIT	UNITS
SAMPLE PREPARATION:		DISSOLVED	DISSOLVED		
DATE SAMPLED:		Jul 5/06	Jul 5/06		
CANTEST ID:		607060093	607060095		
Aluminum	Al	0.032	0.061	0.005	mg/L
Antimony	Sb	<	<	0.001	mg/L
Arsenic	As	0.001	0.021	0.001	mg/L
Barium	Ba	0.085	0.040	0.001	mg/L
Beryllium	Be	<	<	0.001	mg/L
Bismuth	Bi	<	<	0.001	mg/L
Boron	B	<	0.06	0.05	mg/L
Cadmium	Cd	<	<	0.0002	mg/L
Calcium	Ca	43.2	18.8	0.05	mg/L
Chromium	Cr	<	0.001	0.001	mg/L
Cobalt	Co	0.001	0.001	0.001	mg/L
Copper	Cu	<	0.001	0.001	mg/L
Iron	Fe	2.33	13.1	0.05	mg/L
Lead	Pb	<	0.001	0.001	mg/L
Lithium	Li	0.002	0.002	0.001	mg/L
Magnesium	Mg	8.96	4.11	0.05	mg/L
Manganese	Mn	1.67	0.73	0.001	mg/L
Mercury	Hg	<	<	0.02	µg/L
Molybdenum	Mo	<	0.0010	0.0005	mg/L
Nickel	Ni	0.003	0.003	0.001	mg/L
Phosphorus	P	<	<	0.15	mg/L
Potassium	K	2.9	3.0	0.1	mg/L
Selenium	Se	<	<	0.001	mg/L
Silicon	Si	10.0	11.5	0.25	mg/L
Silver	Ag	<	<	0.00025	mg/L
Sodium	Na	3.19	4.17	0.05	mg/L
Strontium	Sr	0.18	0.080	0.001	mg/L
Tellurium	Te	<	<	0.001	mg/L
Thallium	Tl	<	<	0.0001	mg/L
Thorium	Th	<	<	0.0005	mg/L
Tin	Sn	<	<	0.001	mg/L

(Continued on next page)

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706017

Metals Analysis in Water

CLIENT SAMPLE IDENTIFICATION:		MW06-5	Dup 05/07/06	DETECTION LIMIT	UNITS
SAMPLE PREPARATION:		DISSOLVED	DISSOLVED		
DATE SAMPLED:		Jul 5/06	Jul 5/06		
CANTEST ID:		607060093	607060095		
Titanium	Ti	<	0.008	0.001	mg/L
Uranium	U	<	<	0.0005	mg/L
Vanadium	V	<	0.003	0.001	mg/L
Zinc	Zn	0.007	0.009	0.005	mg/L
Zirconium	Zr	<	<	0.01	mg/L

mg/L = milligrams per liter
< = Less than detection limit

µg/L = micrograms per liter

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706017

CANTEST®

Polycyclic Aromatic Hydrocarbons in Water

CLIENT SAMPLE IDENTIFICATION:	MW06-1	MW06-2	MW06-3	MW06-4	
DATE SAMPLED:	Jul 5/06	Jul 5/06	Jul 5/06	Jul 5/06	
CANTEST ID:	607060079	607060082	607060084	607060088	DETECTION LIMIT
ANALYSIS DATE:	Jul 11/06	Jul 11/06	Jul 11/06	Jul 11/06	
Naphthalene	<	9.2	<	<	0.3
Acenaphthylene	<	<	<	<	0.1
Quinoline	<	<	<	<	0.5
Acenaphthene	0.68	<	<	<	0.1
Fluorene	0.43	<	<	<	0.05
Phenanthrene	<	<	<	<	0.05
Anthracene	<	<	<	<	0.01
Acridine	<	<	<	<	0.05
Total LMW-PAH's	1.11	9.2			
Fluoranthene	<	0.11	<	<	0.04
Pyrene	<	0.10	0.02	<	0.02
Benzo(a)anthracene	<	0.02	<	<	0.01
Chrysene	<	0.02	<	<	0.01
Benzo(b)fluoranthene	<	<	<	<	0.01
Benzo(k)fluoranthene	<	<	<	<	0.01
Benzo(a)pyrene	<	<	<	<	0.01
Indeno(1,2,3-cd)pyrene	<	<	<	<	0.01
Dibenz(a,h)anthracene	<	<	<	<	0.01
Benzo(g,h,i)perylene	<	<	<	<	0.01
Total HMW-PAH's		0.25	0.02		
Total PAH's	1.11	9.45	0.02		

Results expressed as micrograms per liter (μg/L)
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706017

Polycyclic Aromatic Hydrocarbons in Water

CLIENT SAMPLE IDENTIFICATION:	MW06-5	Dup 05/07/06	
DATE SAMPLED:	Jul 5/06	Jul 5/06	
CANTEST ID:	607060093	607060095	DETECTION LIMIT
ANALYSIS DATE:	Jul 11/06	Jul 11/06	
Naphthalene	<	<	0.3
Acenaphthylene	<	<	0.1
Quinoline	<	<	0.5
Acenaphthene	<	<	0.1
Fluorene	<	<	0.05
Phenanthrene	<	<	0.05
Anthracene	<	<	0.01
Acridine	<	<	0.05
Total LMW-PAH's			
Fluoranthene	<	<	0.04
Pyrene	<	<	0.02
Benzo(a)anthracene	<	<	0.01
Chrysene	<	<	0.01
Benzo(b)fluoranthene	<	<	0.01
Benzo(k)fluoranthene	<	<	0.01
Benzo(a)pyrene	<	<	0.01
Indeno(1,2,3-cd)pyrene	<	<	0.01
Dibenz(a,h)anthracene	<	<	0.01
Benzo(g,h,i)perylene	<	<	0.01
Total HMW-PAH's			
Total PAH's			

Results expressed as micrograms per liter (μg/L)
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706017

CANTEST®

Monocyclic Aromatic Hydrocarbons in Water

CLIENT SAMPLE IDENTIFICATION:	MW06-1	MW06-2	
DATE SAMPLED:	Jul 5/06	Jul 5/06	
CANTEST ID:	607060079	607060082	DETECTION LIMIT
ANALYSIS DATE:	Jul 6/06	Jul 6/06	
Benzene	-	<	0.5
Ethylbenzene	-	0.7	0.5
Toluene	-	<	0.5
Xylenes	-	2.5	0.5
Volatile Hydrocarbons VHw6-10	<	2400	100
VPHw	<	2400	100
Styrene	-	<	0.5
Surrogate Recovery			
Toluene-d8	101	107	-
Bromofluorobenzene	94	112	-

Results expressed as micrograms per liter (μg/L)
Surrogate recoveries expressed as percent (%)
< = Less than detection limit

CANTEST®

Volatile Organic Compounds in Water

CLIENT SAMPLE IDENTIFICATION:	MW06-1	
DATE SAMPLED:	Jul 5/06	
CANTEST ID:	607060079	DETECTION LIMIT
ANALYSIS DATE:	Jul 6/06	
Benzene	<	0.1
Bromodichloromethane	<	0.1
Bromoform	<	0.2
Bromomethane	<	0.8
2-Butanone	<	5
Carbon Tetrachloride	<	0.1
Chlorobenzene	<	0.1
Chloroethane	<	0.4
Chloroform	<	0.3
Chloromethane	<	0.4
Dibromochloromethane	<	0.1
1,2-Dibromoethane	<	0.1
Dibromomethane	<	0.2
Dichlorodifluoromethane	<	0.2
1,2-Dichlorobenzene	<	0.1
1,3-Dichlorobenzene	<	0.1
1,4-Dichlorobenzene	<	0.1
1,1-Dichloroethane	<	0.1
1,2-Dichloroethane	<	0.4
1,1-Dichloroethene	<	0.1
cis-1,2-Dichloroethene	<	0.1
trans-1,2-Dichloroethene	<	0.1
1,2-Dichloropropane	<	0.1
cis-1,3-Dichloropropene	<	0.1
trans-1,3-Dichloropropene	<	0.1
Ethylbenzene	<	0.1
2-Hexanone	<	5
4-Methyl-2-pentanone	<	2
Methylene Chloride	<	6
Styrene	<	0.1
1,1,2,2-Tetrachloroethane	<	0.2

(Continued on next page)

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706017

CANTEST®

Volatile Organic Compounds in Water

CLIENT SAMPLE IDENTIFICATION:	MW06-1	
DATE SAMPLED:	Jul 5/06	
CANTEST ID:	607060079	DETECTION LIMIT
ANALYSIS DATE:	Jul 6/06	
Tetrachloroethene	<	0.1
Toluene	<	0.1
1,1,1-Trichloroethane	<	0.1
1,1,2-Trichloroethane	<	0.1
Trichloroethene	<	0.1
Trichlorofluoromethane	<	0.2
Vinyl Chloride	<	0.2
Xylenes	5.3	0.1
Surrogate Recovery		
1,2-Dichloroethane-d4	85	-
Toluene-d8	101	-
Bromofluorobenzene	94	-

Results expressed as micrograms per liter (μg/L)
Surrogate recoveries expressed as percent (%)
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706017

CANTEST

Chlorinated Phenols in Water

CLIENT SAMPLE IDENTIFICATION:	MW06-1	MW06-2	MW06-3	MW06-4	
DATE SAMPLED:	Jul 5/06	Jul 5/06	Jul 5/06	Jul 5/06	DETECTION LIMIT
CANTEST ID:	607060079	607060082	607060084	607060088	
Pentachlorophenol	<	<	0.3	<	0.05
2,3,4-Trichlorophenol	<	<	<	<	0.1
2,3,5-Trichlorophenol	<	<	<	<	0.1
2,3,6-Trichlorophenol	<	<	<	<	0.1
2,4,5-Trichlorophenol	<	<	<	<	0.1
2,4,6-Trichlorophenol	<	<	<	<	0.1
3,4,5-Trichlorophenol	<	<	<	<	0.1
2,3,4,5-Tetrachlorophenol	<	<	<	<	0.05
2,3,4,6-Tetrachlorophenol	<	<	<	<	0.05
Total Trichlorophenols	<	<	<	<	0.1
Total Tetrachlorophenols	<	<	<	<	0.05
Total Chlorinated Phenols	<	<	0.3	<	0.05
Surrogate Recovery					
2,4,6-Tribromophenol	77	92	75	89	-

Results expressed as micrograms per liter (μg/L)
Surrogate recoveries expressed as percent (%)
< = Less than detection limit

CANTEST®

Chlorinated Phenols in Water

CLIENT SAMPLE IDENTIFICATION:	**MW06-5**	**Dup 05/07/06**	
DATE SAMPLED:	Jul 5/06	Jul 5/06	DETECTION LIMIT
CANTEST ID:	607060093	607060095	
Pentachlorophenol	<	<	0.05
2,3,4-Trichlorophenol	<	<	0.1
2,3,5-Trichlorophenol	<	<	0.1
2,3,6-Trichlorophenol	<	<	0.1
2,4,5-Trichlorophenol	<	<	0.1
2,4,6-Trichlorophenol	<	<	0.1
3,4,5-Trichlorophenol	<	<	0.1
2,3,4,5-Tetrachlorophenol	<	<	0.05
2,3,4,6-Tetrachlorophenol	<	<	0.05
Total Trichlorophenols	<	<	0.1
Total Tetrachlorophenols	<	<	0.05
Total Chlorinated Phenols	<	<	0.05
Surrogate Recovery			
2,4,6-Tribromophenol	96	82	-

Results expressed as micrograms per liter (μg/L)
Surrogate recoveries expressed as percent (%)
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706017

CANTEST®

Extractable Petroleum Hydrocarbons (EPH) in Water

CLIENT SAMPLE IDENTIFICATION:	SAMPLE DATE	CANTEST ID	EPHw10-19	EPHw19-32
MW06-1	Jul 5/06	607060079	260	300
MW06-2	Jul 5/06	607060082	2900	350
MW06-3	Jul 5/06	607060084	<	<
MW06-4	Jul 5/06	607060088	<	<
MW06-5	Jul 5/06	607060093	<	<
Dup 05/07/06	Jul 5/06	607060095	<	380
DETECTION LIMIT			250	250
UNITS			µg/L	µg/L

µg/L = micrograms per liter
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706017

CANTEST®

Extractable Petroleum Hydrocarbons - PAH Corrected in Water

CLIENT SAMPLE IDENTIFICATION:	SAMPLE DATE	CANTEST ID	LEPHw (corrected for PAH's)	HEPHw (corrected for PAH's)
MW06-1	Jul 5/06	607060079	260	300
MW06-2	Jul 5/06	607060082	2900	350
MW06-3	Jul 5/06	607060084	<	<
MW06-4	Jul 5/06	607060088	<	<
MW06-5	Jul 5/06	607060093	<	<
Dup 05/07/06	Jul 5/06	607060095	<	380
DETECTION LIMIT			250	250
UNITS			µg/L	µg/L

µg/L = micrograms per liter
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706017

CANTEST®

Batch Quality Control for Monocyclic Aromatic Hydrocarbons in Water (QC# 83235)

Parameter	Blank (ug/L)	Blank Limits	Duplicate (R.P.D.) 607060381	Duplicate Limits	Volatiles Water Spike (% Recovery)	Volatiles Water Spike Limits
Benzene	< 0.1	0.1	12.2	20	88	79 - 117
Ethylbenzene	< 0.1	0.1	8	20	89	76 - 124
Toluene	< 0.1	0.2	8.7	20	95	83 - 118
Xylenes	< 0.1	0.1	9.6	20	93	75 - 125
Volatile Hydrocarbons VHw6-10	< 100	100	4.1	20	-	-

ug/L = micrograms per liter
R.P.D. = Relative Percent Difference

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706017

Batch Quality Control for Extractable Petroleum Hydrocarbons (EPH) in Water (QC# 83193)

Parameter	Blank (ug/L)	Blank Limits
EPHw10-19	< 250	250
EPHw19-32	< 250	250

ug/L = micrograms per liter

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706017

CANTEST®

Batch Quality Control for Dissolved Metals Analysis in Water (QC# 83167)

Parameter		Dissolved Blank (mg/L)	Dissolved Blank Limits
Aluminum	Al	0.001	0.015
Antimony	Sb	< 0.0002	0.001
Arsenic	As	< 0.0002	0.001
Barium	Ba	< 0.0002	0.001
Beryllium	Be	< 0.0002	0.001
Cadmium	Cd	< 0.00004	0.001
Chromium	Cr	< 0.0002	0.001
Cobalt	Co	< 0.0002	0.001
Copper	Cu	< 0.0002	0.001
Lead	Pb	< 0.0002	0.001
Manganese	Mn	< 0.0002	0.001
Mercury	Hg	< 0.02	0.05
Molybdenum	Mo	< 0.0001	0.001
Nickel	Ni	0.0003	0.001
Potassium	K	0.02	0.05
Silver	Ag	< 0.00005	0.001
Strontium	Sr	< 0.0002	0.001
Thallium	Tl	< 0.00002	0.001
Thorium	Th	< 0.0001	0.0005
Tin	Sn	< 0.0002	0.005
Titanium	Ti	< 0.0002	0.001
Uranium	U	< 0.0001	0.0005
Vanadium	V	< 0.0002	0.001
Zinc	Zn	0.003	0.01
Zirconium	Zr	< 0.002	0.01

mg/L = milligrams per liter
Mercury Hg expressed as: ug/L (micrograms per liter)

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706017

CANTEST®

Batch Quality Control for Polycyclic Aromatic Hydrocarbons in Water (QC# 83192)

Parameter	Blank (ug/L)	Blank Limits	Spike (% Recovery)	Spike Limits
Naphthalene	< 0.3	0.3	98	43 - 125
Acenaphthylene	< 0.1	0.1	94	64 - 116
Acenaphthene	< 0.1	0.1	94	62 - 116
Fluorene	< 0.05	0.05	94	70 - 108
Phenanthrene	< 0.05	0.05	98	74 - 118
Anthracene	< 0.01	0.05	90	73 - 117
Acridine	< 0.05	0.05	84	63 - 120
Fluoranthene	< 0.04	0.05	92	75 - 121
Pyrene	< 0.02	0.02	88	78 - 120
Benzo(a)anthracene	< 0.01	0.01	86	76 - 118
Chrysene	< 0.01	0.01	88	71 - 127
Benzo(b)fluoranthene	< 0.01	0.01	84	59 - 138
Benzo(k)fluoranthene	< 0.01	0.01	84	72 - 114
Benzo(a)pyrene	< 0.01	0.1	88	80 - 120
Indeno(1,2,3-cd)pyrene	< 0.01	0.01	84	61 - 123
Dibenz(a,h)anthracene	< 0.01	0.01	82	58 - 126
Benzo(g,h,i)perylene	< 0.01	0.01	82	64 - 116

ug/L = micrograms per liter

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: July 17, 2006

GROUP NUMBER: 70706017

CANTEST®

Batch Quality Control for Chlorinated Phenols in Water (QC# 83306)

Parameter	Blank (ug/L)	Blank Limits	Duplicate (R.P.D.) 607060079	Duplicate Limits	Spike (% Recovery)	Spike Limits
Pentachlorophenol	< 0.05	0.05	NC	25	106	50 - 150
2,3,4-Trichlorophenol	< 0.1	0.1	NC	25	99	56 - 130
2,3,5-Trichlorophenol	< 0.1	0.1	NC	25	101	65 - 130
2,3,6-Trichlorophenol	< 0.1	0.1	NC	25	103	50 - 130
2,4,5-Trichlorophenol	< 0.1	0.1	NC	25	103	55 - 135
2,4,6-Trichlorophenol	< 0.1	0.1	NC	25	102	50 - 135
3,4,5-Trichlorophenol	< 0.1	0.1	NC	25	102	60 - 132
2,3,4,5-Tetrachlorophenol	< 0.05	0.05	NC	25	95	55 - 130
2,3,4,6-Tetrachlorophenol	< 0.05	0.05	NC	25	106	50 - 138

ug/L = micrograms per liter
R.P.D. = Relative Percent Difference
NC = Not Calculated. Duplicate sample results were less than the detection limit. Relative Percent Difference calculation is not defined for analyte levels of less than detection limit.

Instrument Quality Control for the GC #HP10 Dual ECD (QC# 163654)

QC Type: Calibration Verification

Parameter	% Recovery	Limits
Pentachlorophenol	98	85 - 115
2,3,4-Trichlorophenol	98	85 - 115
2,3,5-Trichlorophenol	98	85 - 115
2,3,6-Trichlorophenol	98	85 - 115
2,4,5-Trichlorophenol	102	85 - 115
2,4,6-Trichlorophenol	98	85 - 115
3,4,5-Trichlorophenol	98	85 - 115
2,3,4,5-Tetrachlorophenol	102	85 - 115
2,3,4,6-Tetrachlorophenol	102	85 - 115

Instrument Quality Control for the Beckman 240 pH Meter (QC# 163372)

QC Type: Calibration Verification

Parameter	% Recovery	Limits
pH, Laboratory	100	98 - 102

Batch Quality Control for Volatile Organic Compounds in Water (QC# 83235)

Parameter	Volatiles Water Spike (% Recovery)	Volatiles Water Spike Limits
Benzene	88	83 - 119
Bromodichloromethane	92	70 - 130
Bromoform	105	71 - 135
Carbon Tetrachloride	92	79 - 121
Chlorobenzene	90	83 - 119
Chloroform	88	70 - 130
Dibromochloromethane	105	69 - 129
1,2-Dibromoethane	107	71 - 125
Dibromomethane	100	69 - 139
1,2-Dichlorobenzene	99	77 - 127
1,3-Dichlorobenzene	93	79 - 123
1,4-Dichlorobenzene	98	79 - 123
1,1-Dichloroethane	88	74 - 118
1,2-Dichloroethane	94	70 - 138
1,1-Dichloroethene	88	72 - 126
cis-1,2-Dichloroethene	94	78 - 122
trans-1,2-Dichloroethene	91	78 - 124
1,2-Dichloropropane	91	78 - 126
cis-1,3-Dichloropropene	94	73 - 127
trans-1,3-Dichloropropene	93	69 - 127
Ethylbenzene	89	75 - 121
Styrene	97	76 - 128
1,1,2,2-Tetrachloroethane	83	70 - 132
Tetrachloroethene	93	74 - 126
Toluene	95	74 - 122
1,1,1-Trichloroethane	90	83 - 125
1,1,2-Trichloroethane	102	72 - 130
Trichloroethene	107	86 - 116
Trichlorofluoromethane	89	74 - 130
Xylenes	93	81 - 119

ug/L = micrograms per liter

CANTEST®

Batch Quality Control Frequency Summary

Dissolved Metals Preparation (Batch# 83167)

QC Type	No. Samples
Dissolved Blank	2
Duplicate	4

PAH's in Water Sample Prep (Batch# 83192)

QC Type	No. Samples
Blank	1
Spike	1

TEH/EPH Water Preparation (Batch# 83193)

QC Type	No. Samples
Blank	1
Method Performance Check Spike	1

Volatiles Analysis (Batch# 83235)

QC Type	No. Samples
Blank	1
Duplicate	1
Volatiles Water Spike	1

PCP Water/Leachate Preparation (Batch# 83306)

QC Type	No. Samples
Blank	1
Duplicate	1
Spike	1

(Continued on next page)

CANTEST®

Batch Quality Control Frequency Summary

Dissolved Metals Preparation (Batch# 83167)

QC Type	No. Samples
Batch Size	59

PAH's in Water Sample Prep (Batch# 83192)

QC Type	No. Samples
Batch Size	17

TEH/EPH Water Preparation (Batch# 83193)

QC Type	No. Samples
Batch Size	18

pH Analysis - Trace Organics (Batch# 83212)

QC Type	No. Samples
Batch Size	11

Volatiles Analysis (Batch# 83235)

QC Type	No. Samples
Batch Size	33

PCP Water/Leachate Preparation (Batch# 83306)

QC Type	No. Samples
Batch Size	12

Analysis Report

CANTEST LTD.

Professional
Analytical
Services

4606 Canada Way
Burnaby, B.C.
V5G 1K5

FAX: 604 731 2386

TEL: 604 734 7276

1 800 665 8566

REPORT ON: Analysis of Soil Samples

REPORTED TO: CANTEST Ltd. - Re-analysis Requests
4606 Canada Way
Burnaby, BC
V5G 1K5

Att'n: Aman Nagra

CHAIN OF CUSTODY: 197745
PROJECT NAME: 70706001
PROJECT NUMBER: HEM101

NUMBER OF SAMPLES: 4

REPORT DATE: September 7, 2006

DATE SUBMITTED: June 30, 2006

GROUP NUMBER: 70901071

SAMPLE TYPE: Soil

NOTE: Results contained in this report refer only to the testing of samples as submitted. Other information is available on request.

TEST METHODS:

pH in Soil or Solid - analysis was performed based on procedures described in the "Manual on Soil Sampling and Methods of Analysis" (1993) published by the Canadian Society of Soil Science. The test was performed using a deionized water leach with measurement by pH meter.

Mercury in Soil - analysis was performed using Cold Vapour Atomic Fluorescence.

Strong Acid Leachable Metals in Soil - analysis was performed using B.C. MOELP Method "Strong Acid Leachable Metals in Soil, Version 1.0". The method involves drying the sample at 60 C, sieving using a 2 mm (10 mesh) sieve and digestion using a mixture of hydrochloric and nitric acids. Analysis was performed using Inductively Coupled Argon Plasma Spectroscopy (ICAP) or by specific techniques as described.

Selenium in Soil - analysis was using Inductively Coupled Plasma Mass Spectrometry (ICP/MS).

TEST RESULTS:

(See following pages)

CANTEST LTD.

Anna Becalska, PhD
Coordinator, Trace Metals

REPORTED TO: CANTEST Ltd. - Re-analysis Requests

REPORT DATE: September 7, 2006

GROUP NUMBER: 70901071

Conventional Parameters in Soil

CLIENT SAMPLE IDENTIFICATION:	SAMPLE DATE	CANTEST ID	pH
MW06-1-2	Jun 29/06	609010236	7.2
MW06-1-2 Dup	Jun 29/06	609010237	7.2
Dup-1	Jun 29/06	609010238	7.4
Dup-1 Dup	Jun 29/06	609010239	7.4
DETECTION LIMIT			0.1
UNITS			pH units

REPORTED TO: CANTEST Ltd. - Re-analysis Requests

REPORT DATE: September 7, 2006

GROUP NUMBER: 70901071

Strong Acid Soluble Metals in Soil

CLIENT SAMPLE IDENTIFICATION:		MW06-1-2	MW06-1-2 Dup	Dup-1	Dup-1 Dup	
DATE SAMPLED:		Jun 29/06	Jun 29/06	Jun 29/06	Jun 29/06	DETECTION LIMIT
CANTEST ID:		609010236	609010237	609010238	609010239	
Antimony	Sb	<	<	<	<	10
Arsenic	As	<	<	<	<	10
Barium	Ba	56	61	59	57	1
Beryllium	Be	<	<	<	<	1
Cadmium	Cd	<	<	<	<	0.5
Chromium	Cr	26	26	24	25	2
Cobalt	Co	8	8	8	8	1
Copper	Cu	15	15	15	15	1
Lead	Pb	<	<	<	<	5
Mercury	Hg	0.02	0.03	0.02	0.02	0.01
Molybdenum	Mo	<	<	<	<	4
Nickel	Ni	32	32	31	31	2
Selenium	Se	<	<	<	<	1
Silver	Ag	<	<	<	<	2
Tin	Sn	<	<	<	<	5
Vanadium	V	35	34	35	35	1
Zinc	Zn	39	39	38	38	1
Aluminum	Al	8110	7940	8180	8140	10
Boron	B	<	<	<	<	1
Calcium	Ca	4130	3940	4040	4100	1
Iron	Fe	17000	16600	16500	16700	2
Magnesium	Mg	7010	7080	7010	7040	0.1
Manganese	Mn	327	319	327	337	1
Phosphorus	P	451	425	411	433	20
Potassium	K	484	507	528	517	10
Sodium	Na	230	228	243	231	5
Strontium	Sr	22	21	24	24	1
Titanium	Ti	442	457	476	468	1
Zirconium	Zr	4	4	5	5	1

Results expressed as micrograms per gram, on a dry weight basis. (µg/g)
< = Less than detection limit

REPORTED TO: CANTEST Ltd. - Re-analysis Requests

REPORT DATE: September 7, 2006

GROUP NUMBER: 70901071

Batch Quality Control for Strong Acid Soluble Metals in Soil (QC# 85275)

Parameter		Blank (ug/g)	Blank Limits	CAN MET Till-1 (% Recovery)	CAN MET Till-1 Limits	Duplicate (R.P.D.) 609010189	Duplicate Limits
Arsenic	As	< 10	10	115	77 - 146	-	-
Barium	Ba	< 1	1	-	-	-	-
Copper	Cu	< 1	1	-	-	-	-
Lead	Pb	< 5	5	125	65 - 171	-	-
Mercury	Hg	< 0.01	0.001	86	33 - 174	0	30
Nickel	Ni	< 2	2	94	49 - 149	-	-
Zinc	Zn	< 1	1	93	79 - 114	-	-
Calcium	Ca	-	-	73	51 - 106	-	-
Iron	Fe	-	-	102	74 - 139	-	-
Manganese	Mn	-	-	117	92 - 138	-	-

ug/g = micrograms per gram
R.P.D. = Relative Percent Difference

FINAL REPORT

Supplemental Phase 2 Environmental Site Assessment
Brownsville Site, Surrey, BC

Prepared for:
VANCOUVER FRASER PORT AUTHORITY
400 – 625 Agnes Street
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HEMMERA

February 10, 2009
File: 405-003.04

Vancouver Fraser Port Authority
400 – 625 Agnes Street
New Westminster, BC V3M 5Y4

Attention: **Nures Kara, Environmental Manager**

Dear Mr. Kara,

RE: **Supplemental Phase 2 Environmental Site Assessment, Brownsville Site, Surrey, BC**

Hemmera is pleased to provide the Vancouver Fraser Port Authority (VFPA) an electronic (PDF) copy of the Supplemental Phase 2 Environmental Site Assessment (ESA) report (final version). Hardcopies will be compiled and submitted upon request from VFPA.

We have appreciated the opportunity to work with you on this project and trust that this report meets your requirements. Please feel free to contact the undersigned by phone or email regarding any questions or further information that you may require.

Regards,
HEMMERA

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EXECUTIVE SUMMARY

Hemmera, on behalf of Vancouver Fraser Port Authority (VFPA), conducted a Supplemental Phase 2 Environmental Site Assessment (ESA) at the VFPA Brownsville Site in Surrey, BC (the "Site"). The location of the Site is shown on **Figure 1**.

The Brownsville Site is a 1.43-hectare property owned by the Canadian National Railway Company (CN). The Site is comprised of six parcels (Parcel A, B, C, Rem-C, 7 and 8) situated between the Fraser River and the CN Rail Line, southwest of the Pattullo Bridge (see **Figure 2**).

The Supplemental Phase 2 ESA program was based on the following work previously completed by Hemmera:

- *Phase 1 ESA, Brownsville Site, Surrey, BC, September 2006*.
- *Phase 2 ESA, Brownsville Site, Surrey, BC, May 2008*.
- Findings of additional Phase 2 ESA work conducted from June to August 2007 (details /findings of the program are included in this report).

Hemmera understands that the Phase 1 ESA and Phase 2 ESA are being conducted in support of a proposed property transfer of the Brownsville Site from CN to Transport Canada (administered by VFPA).

The Phase 1 ESA identified seven areas of potential environmental concern (APECs) that were investigated through a Phase 2 ESA program in June/July 2006. The Phase 2 ESA consisted of the installation of five monitoring wells (MW06-1, MW06-2, MW06-3, MW06-4 and MW06-5) and analysis of soil and groundwater samples. As a result of the June/July 2006 work, one area of environmental concern (AEC-1) was identified in the vicinity of MW06-2. Volatile petroleum hydrocarbon (VPH) and/or extractable petroleum hydrocarbon (EPH) contamination was identified in soil and groundwater at AEC-1.

Between June and August 2007 and September 2008, Hemmera conducted a Supplemental Phase 2 ESA to:

- Delineate soil contamination identified in vicinity of AEC-1.
- Delineate groundwater contamination identified in vicinity of AEC-1.
- Evaluate potential remedial/Site management options.

The Phase 2 ESA included:

- Advancement of four boreholes (MW07-6, MW07-7, MW07-8 and MW07-9) and installation of four monitoring wells in June-August 2007.
- Advancement of four boreholes (MW08-10, MW08-11, BH08-12 and MW08-13) and installation of three monitoring wells in September 2008.
- Soil analysis.
- Groundwater monitoring and sampling.

The Supplemental Phase 2 ESA included the following findings:

- VPH impacted soil is present within the upper sand unit and the lower silt unit (from approximately 1.4 to 2.4 m bgs) in AEC-1. VPH contaminated soil has essentially been delineated (laterally and vertically) on-site; however, the lateral extent of VPH contamination off-site to southeast of BH08-12 is unknown.
- It is estimated that approximately 400 m^3 of soil impacted with VPH concentrations greater than the applicable provincial industrial land use (IL) standards in present within AEC-1. However, we would recommend additional investigation to confirm this number, and to further constrain the contamination extent, if a remediation plan were to be developed.
- Light extractable petroleum hydrocarbon (LEPH) contaminated groundwater was identified in MW06-2, MW07-6 and MW07-7, and has essentially been delineated on-site. A source for the contamination was not identified in upgradient monitoring well MW07-9. LEPH concentrations in groundwater decreased between July/August 2007 and September 2008.
- The groundwater samples collected in September 2008 did not exceed the applicable provincial standards for VPH.
- Based on a review of the laboratory chromatograms, the elevated VPH in soil and groundwater samples is consistent with an aromatic petroleum hydrocarbon solvent (i.e. Varsol ©).
- Overall, the contamination appears to be localized and the concentrations of VPH and LEPH in groundwater have decreased between July/August 2007 and September 2008.

In consideration of the above findings and in support of the intended property transfer, a remedial options evaluation was completed to evaluate potential remedial/Site management options (included under separate cover).

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1.0 INTRODUCTION

Hemmera, on behalf of Vancouver Fraser Port Authority (VFPA), conducted a Supplemental Phase 2 Environmental Site Assessment (ESA) at the VFPA Brownsville Site in Surrey, BC (the "Site"). The location of the Site is shown on **Figure 1**.

The Brownsville Site is a 1.43-hectare property owned by the Canadian National Railway Company (CN). The Site is comprised of six parcels (Parcel A, B, C, Rem-C, 7 and 8) situated between the Fraser River and the CN Rail Line, southwest of the Pattullo Bridge (see **Figure 2**).

The Supplemental Phase 2 ESA program was based on the following work previously completed by Hemmera:

- *Phase 1 ESA, Brownsville Site, Surrey, BC, September 2006*.
- *Phase 2 ESA, Brownsville Site, Surrey, BC, May 2008*.
- Findings of additional Phase 2 ESA work conducted from June to August 2007 (details /findings of the program are included in this report).

Hemmera understands that the Phase 1 ESA and Phase 2 ESA are being conducted in support of a proposed property transfer of the Brownsville Site from CN to Transport Canada (administered by VFPA).

The Phase 1 ESA[1] identified seven areas of potential environmental concern (APECs) that were investigated through a Phase 2 ESA[2] program in June/July 2006. The Phase 2 ESA consisted of the installation of five monitoring wells (MW06-1, MW06-2, MW06-3, MW06-4 and MW06-5) and analysis of soil and groundwater. As a result of the June/July 2006 work, one area of environmental concern (AEC-1) was identified in the vicinity of MW06-2. Volatile petroleum hydrocarbon (VPH) and/or extractable petroleum hydrocarbon (EPH) contamination was identified in soil and groundwater at AEC-1.

Follow-up Phase 2 ESA work, consisting of the installation of four additional monitoring wells (MW07-6, MW07-7, MW07-8 and MW07-9), was conducted from June to August 2007 in an attempt to delineate soil and groundwater contamination identified at AEC-1. Based on the results of the additional Phase 2 ESA work, delineation of soil and groundwater contamination was not completed.

To further delineate the contamination, additional Phase 2 ESA work, consisting of the advancement of one borehole (BH08-12) and the installation of three monitoring wells (MW08-10, MW08-11 and MW08-13) was completed in September 2008.

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1 Refer to Hemmera report entitled, *"Phase 1 Environmental Site Assessment, Fraser River Port Authority, Brownsville Site, Surrey, BC",* dated September 2006 for details.

2 Refer to Hemmera report entitled, *"Final Report, Phase 2 Environmental Site Assessment, Brownsville Site, Surrey, BC"*, dated May 2008 for details.

The AEC, Contaminants of Concern (COCs), investigation locations and rationale are provided in **Table A**, below.

Table A Areas of Environmental Concern

AEC Reference Number	AEC Description	Investigation Locations	Rationale	COCs
1	Soil and groundwater contamination in vicinity of MW06-2	MW06-2, MW06-3, MW07-6, MW07-7, MW07-8, MW07-9, MW08-10, MW08-11, BH08-12, MW08-13	Delineate soil and groundwater contamination identified in vicinity of MW06-2	EPH, BTEX/VPH

1.1 PROFESSIONAL STATEMENT

This report includes the interpretation of investigation results and a comparison of chemical analytical data to applicable standards specified in the BC Ministry of Environment (MOE) Contaminated Sites Regulation (CSR), including amendments up to BC Reg. 239/2007, which came into effect July 1, 2007. This report was prepared using protocols consistent with the requirements of the BCMOE *Environmental Management Act* and the CSR.

This report also includes the interpretation of investigation results and comparison of chemical analytical data to the *Canadian Environmental Quality Guidelines*, as established by the *Canadian Council of Ministers for the Environment*, (CCME 2005), as requested by VFPA.

Hemmera confirms that the persons signing this report have demonstrable experience in the investigation of the type of contaminants of concern (COCs) at the Site.

1.2 OBJECTIVES

The objectives of the Supplemental Phase 2 ESA are as follows:

- Delineate soil contamination identified in vicinity of AEC-1.
- Delineate groundwater contamination identified in vicinity of AEC-1.
- Evaluate potential remedial/Site management options for the Site.

1.3 SCOPE OF WORK

To achieve the objectives, the following work was completed as part of the Supplemental Phase 2 ESA program. The Supplemental Phase 2 ESA program consists of work conducted in June/August 2007 and September 2008.

- A Site specific health and safety plan (HASP) was developed and presented by Hemmera field staff to subcontractors prior to commencing work.
- Underground utility lines (potential and known) in the vicinity of the proposed borehole locations were identified by a private utility locate company (Inter-Project Systems). Proposed borehole locations were adjusted to allow a safe working distance (at least two metres) from potential or known underground utilities.
- Four boreholes (MW07-6, MW07-7, MW07-8 and MW07-9) were advanced by Rocky Mountain Soil Sampling (RMSS) of North Vancouver, BC in August 2007. The four boreholes were completed as monitoring wells.
- Four additional boreholes (MW08-10, MW08-11, BH08-12 and MW08-13) were advanced by Beck Drilling and Environmental Services Ltd. (BECK) of Richmond, BC in September 2008. Three of the four boreholes were completed as monitoring wells. As proposed in the Hemmera workplan, *Proposed Workplan and Cost Estimate to Conduct a Phase 2 ESA at the VFPA Brownsville Site,* dated June 11, 2008, BH08-12 was advanced prior to MW08-13. As contamination was observed at BH08-12, a step-out location (MW08-13) was drilled in an attempt to further delineate the contamination.
- Soil samples were collected from the boreholes and submitted to Cantest Ltd. (Cantest) of Burnaby, BC, for analyses of COCs.
- Groundwater monitoring and sampling was completed at the newly installed monitoring wells and select existing monitoring wells in the vicinity of AEC-1 in August 2007 and September 2008.
- The horizontal position of investigation locations were measured relative to local features, and a differential elevation survey of the investigation locations was completed relative to an assumed benchmark.
- This supplemental Phase 2 ESA report was prepared.

2.0 REGULATORY FRAMEWORK

The following section outlines the regulatory framework under which the work was completed.

2.1 PROVINCIAL LEGISLATION AND REGULATIONS

For properties under provincial jurisdiction in BC, the relevant contaminated sites legislation includes the *Environmental Management Act* (EMA), the BC *Contaminated Sites Regulation* (CSR) (BC Reg 375/96, including July 2007 amendments) and the *Hazardous Waste Regulation* (HWR). These three pieces of legislation provide soil and groundwater quality standards for assessment. Other Ministry of Environment documents (protocols, technical and administrative guidance) also pertain to the collection and reporting of data.

The VFPA and Transport Canada agreed to apply Provincial Legislation and Regulations at the Site as BC CSR standards are widely used in BC, cover more criteria than federal guidelines and have been used by VFPA in previous land transactions.

2.2 FEDERAL GUIDELINES

VFPA requested that federal guidelines be provided for comparison. Federal environmental quality guidelines for soil and groundwater are provided by the *Canadian Environmental Quality Guidelines* and *Canada Wide Standards for Petroleum Hydrocarbons in Soil* (CWS*).*

The Canadian Environmental Quality Guidelines, as established by the *Canadian Council of Ministers for the Environment* (CCME 1999, updated to 2006), include soil quality guidelines that are based on direct contact, ingestion and inhalation toxicity data. Guidelines exist for agricultural, residential/parkland, commercial, and industrial land uses. The water quality guidelines include guidelines for drinking water, recreational water, protection of freshwater and marine aquatic life, irrigation water and livestock water use.

The Canada Wide Standards for Petroleum Hydrocarbons in Soil (CWS*)* is a three-tiered risk based remedial standard developed for four generic land uses: agricultural, residential/parkland, commercial, and industrial. Petroleum hydrocarbons are divided into four fractions. Fraction 1 (F1) includes hydrocarbons from C_6 to C_{10}, Fraction 2 (F2) includes hydrocarbons rom C_{10} to C_{16}, Fraction 3 (F3) includes hydrocarbons from C_{16} to C_{34}, and Fraction 4 (F4) includes hydrocarbons above C_{35}.

2.3 APPLICABLE SOIL CRITERIA

Provincial BC CSR industrial land use (IL) standards have been applied at this stage of the investigation. Federal CCME IL guidelines and CWS IL standards have been provided at request of VFPA.

In accordance with the CSR (as amended on July 1, 2007), the applicable matrix soil standards applied are:

- "Intake of contaminated soil" (mandatory for all sites).
- "Groundwater flow to surface water used by aquatic life (marine and freshwater)", (a Site specific feature).
- "Toxicity to soil invertebrates and plants" (mandatory for all sites).

Where applicable, the most stringent of the above-noted matrix standards was used. Generic numerical standards were used where matrix standards were not available.

Where analytical methodologies prescribed by the provincial and federal criteria are similar, the investigative results were compared to both of these criteria. In the case of the general hydrocarbon scan, the CWS analytical methodology was not used and results are therefore not directly comparable (CWS criteria are not provided in **Table 1**).

2.4 APPLICABLE GROUNDWATER CRITERIA

The applicable groundwater standards for the Site are based on the BC CSR and are dependant on water use, distance and travel time to the closest aquatic receptors.

The closest aquatic receptor to the Site is the Fraser River (a marine aquatic environment); located approximately 50 m down gradient to the northwest, therefore the CSR standards for the protection of marine and freshwater aquatic life (AW) were applied.

CCME guidelines for the protection of marine aquatic life (MAL) and freshwater aquatic life (FAL) were provided for reference at request of VFPA. Environment Canada has acknowledged that the appropriate aquatic life groundwater evaluation criteria for federal contaminated sites includes the CCME Canadian Water Quality Guidelines for the protection of marine aquatic life (MAL) multiplied by a factor of ten (CCME MAL x 10) to recognize, as the CSR does, that dilution of groundwater occurs when it reaches potential aquatic receptors.

With respect to groundwater use, a search of the BC groundwater well database indicated that one off-site groundwater well (domestic) is located approximately 1.5 km to the southeast. As the well is located upgradient and 1.5 km from the site, drinking water standards were not applied.

The land in the vicinity of the Site is not used for agricultural purposes (it is used for commercial/industrial purposes); therefore, neither irrigation nor livestock watering standards were applied.

3.0 FIELD INVESTIGATION METHODOLOGIES

3.1 BOREHOLE DRILLING

On August 15, 2007 four boreholes (MW07-6, MW07-7, MW07-8 and MW07-9) were advanced to a maximum of 4.57 metres below ground surface (m bgs) using a portable Pionjar drill and a track drill rig supplied by RMSS that is also used in areas of limited access. MW07-6, MW07-7 and MW07-8 were drilled with the track rig and MW07-9 was drilled with the Pionjar (the track rig could not access this location).

On September 16, 2008, four boreholes (MW08-10, MW08-11, BH08-12 and MW08-13) were advanced to a maximum depth of 4.57 m bgs using a limited-access track drill rig supplied by BECK.

As Site soils were sufficiently cohesive, representative soil samples were collected directly from the standard auger flytes at approximate 0.8 m intervals and/or at specific horizons where changes in stratigraphy or soil quality were observed. A split-spoon sampler was used to collect soil samples in MW07-9 (the Pionjar does not use augers) and portions of MW08-10 and MW08-11. The split-spoon sampler yielded poor sample recovery in MW08-10 and MW08-11; therefore, the majority of samples were collected directly from the auger flytes.

A total of 45 soil samples and four duplicate samples (resulting in an approximate 10% duplicate frequency) were collected from eight boreholes. Seventeen samples and two duplicate samples were submitted for analysis of COCs.

Boreholes were logged for soil type, colour, consistency, moisture content, staining, odour and other relevant observations based on the Unified Soil Classification System (USCS).

Borehole and monitoring well locations are illustrated on **Figure 2**.

3.2 SOIL SAMPLING/HANDLING

Soil samples collected during the borehole drilling programs were placed into laboratory-supplied, 125-mL glass jars and sealed with teflon-lined lids. A portion of each sample was also placed in a ziplock bag where the headspace was monitored for combustible soil vapour (CSV) concentrations using a photo ionization detector (PID). Sample jars were identified using labels supplied by Cantest noting the date and sample name. The sample jars were then stored in chilled coolers and shipped via courier to Cantest, accompanied by a Site-specific chain-of-custody form. This form contained pertinent sampling information and analytical requirements.

Boreholes were logged for soil type, colour, consistency, moisture content, staining, odour and other relevant observations. Soil stratigraphy observations are illustrated on borehole logs provided in **Appendix A.**

3.3 MONITORING WELL INSTALLATION

The following methodology was used to install the monitoring wells (monitoring well locations are illustrated on **Figure 2** and logs are provided in **Appendix A**. The monitoring wells were installed using the limited-access track drill rig and/or the Pionjar.

- When the required borehole depth was achieved, the auger or drill rod was removed from the borehole and the monitoring wells were installed directly within the open borehole (Site soils were sufficiently cohesive to allow direct monitoring well installation).
- Monitoring wells (with the exception of MW07-9) were constructed with solid casing (5 cm diameter PVC pipe) and screened casing (5 cm diameter, schedule 10 PVC pipe, with 10-slot 0.25 mm openings). MW07-9 was constructed with solid casing (2.5 cm diameter PVC pipe) and screened casing (2.5 cm diameter, schedule 10 PVC pipe, with 10-slot 0.25 mm openings).
- Well screen lengths were 3.0 m (with the exception of MW07-9), and were positioned at the base of the borehole. MW07-9 was constructed with a 1.5 m screen.
- A silica-sand filter pack was placed around the screened section, extending approximately 0.3 m above the top of the screen and around the upper solid casing section between the bentonite (clay) seal and the concrete.
- A bentonite seal approximately 0.2 m thick was placed within each monitoring well above the sand-filter pack. Each bentonite seal was hydrated upon installation.
- Monitoring wells were completed at surface with a steel flush-mount road-box, secured with concrete.
- Following installation, the wells were developed by removing six well volumes of water (or until the well was dry) with disposable polyurethane bailers to restore the natural hydraulic properties of the water-bearing formation after drilling.
- Groundwater sampling was conducted at least 24 hours after well development.

3.4 GROUNDWATER MONITORING

Groundwater monitoring and sampling was conducted on August 16, 2007 and September 22, 2008. During groundwater monitoring, the following parameters were measured:

- Combustible headspace vapours (CHVs) using a photo-ionization detector (PID).
- Absence/presence of light non-aqueous phase liquid (LNAPL) using a oil/water interface probe.
- Depth to water and depth to bottom using an oil/water interface probe.

Elevation and depth to water data was used to calculate hydraulic gradient and determine groundwater flow direction.

3.5 GROUNDWATER SAMPLING

Groundwater sampling at each monitoring well location was conducted using a low-flow technique with a peristaltic pump and dedicated plastic tubing. Prior to sampling, conductivity, pH, temperature and depth to water were monitored every four minutes using a pH/conductivity probe, until readings had stabilized, indicating representative formation groundwater was obtained.

Groundwater samples were collected in laboratory prepared bottles. Sample bottles were placed in coolers with cold packs and/or ice to maintain sample temperature at approximately 4°C during transportation and prior to laboratory analysis.

Groundwater sampling for the Supplemental Phase 2 ESA was conducted on July 6, 2007, August 16, 2007 and September 22, 2008. The following samples were collected:

- One groundwater sample (MW06-2) was collected on July 6, 2007.
- Four groundwater samples (MW07-6, MW07-7, MW07-8 and MW07-9) were collected on August 16, 2007.
- Eight samples (MW06-2, MW07-6, MW07-7, MW07-8, MW07-9, MW08-10, MW08-11 and MW08-13) were collected on September 22, 2008.

The samples were submitted to Cantest for analysis of COCs. A laboratory Chain of Custody form accompanied the samples during shipment.

3.6 QUALITY ASSURANCE / QUALITY CONTROL

Field quality assurance / quality control (QA/QC) procedures were as follows:

- The drilling and soil sampling equipment was decontaminated between locations/samples.
- For groundwater monitoring, the interface probe was decontaminated between monitoring well locations.
- Dedicated polyurethane tubing was used to collect groundwater samples to avoid cross-contamination.
- Field personnel wore a new pair of nitrile gloves to collect each soil and groundwater sample.
- Samples were placed in glass jars and bottles provided by the laboratory.
- Sample jars/bottles were clearly labelled and identified in the field.

- Two soil duplicate samples and two groundwater duplicate samples were submitted to the laboratory and analyzed for the same parameters at its characterization sample, resulting in an approximate 10% duplicate analysis frequency.
- Variation between sample duplicates was evaluated by calculating the relative percent differences (RPD). In cases where the concentration of a parameter was less than five times the reported detection limit (RDL), the RPD was not calculated. The RPD data quality objectives (DQO) considered were 20% for soil and groundwater.

Laboratory QA/QC procedures were as follows:

- Soil and groundwater analyses were completed by Cantest. The samples submitted to Cantest were subjected to rigorous QA/QC procedures specific to the laboratory. Laboratory QA/QC included internal/surrogate standards, replicates and duplicates, method blanks and method spikes.

4.0 INVESTIGATION RESULTS

4.1 LOCAL SURFACE GEOLOGY

The typical soil stratigraphy encountered during the Supplemental Phase 2 ESA consisted of predominately loose medium-fine grained sands with trace silt overlying medium-stiff silt with trace clay and trace sand. Intermittent lenses of peat and wood debris were observed in the upper sand layer. For details, refer to borehole/monitoring well logs provided in **Appendix A**.

4.2 HYDROGEOLOGY

Groundwater elevations were calculated using depth to water measurements collected in September 2008 (measured from the top of monitoring well casing)[3]. Groundwater elevations ranged from 97.649 m (MW07-8) to 97.267 m (MW08-100) as shown on **Figure 3.**

Using groundwater elevations, the local groundwater flow direction and horizontal hydraulic gradient were estimated by preparing a water table contour map **(Figure 3).** The contours are a graphical representation of the groundwater elevation, and are used to illustrate groundwater flow direction. The groundwater flow direction is perpendicular to the contours.

Based on September 2008 groundwater monitoring event, it appears that groundwater flows in a northwest direction toward the Fraser River at a horizontal hydraulic gradient of approximately 0.009 m/m (as measured between MW07-9 and MW08-10). Groundwater flow is expected to be heavily influenced by surface water levels in the Fraser River.

The average depth to groundwater in August 2007 was 1.415 m, and the average depth to groundwater in September 2008 was 1.958 m. The increased average depth to water in September 2008 is likely a result seasonal fluctuation of the Fraser River. Tidal effects are also possible.

4.3 SOIL ANALYTICAL RESULTS

The results of the soil analytical program are presented in **Table 1** and **Figure 4.** The certified laboratory analytical reports are included in **Appendix B.**

Soil samples that exceeded the applicable CSR IL standards in one or more of the parameters analyzed are summarized in **Table B,** below. The federal guidelines were not exceeded.

[3] Refer to Hemmera report entitled, "*Final Report, Phase 2 Environmental Site Assessment, Brownsville Site, Surrey, BC"*, dated May 2008 for survey data.

Table B Soil Exceedances

AEC Reference Number	AEC Description	Investigation Locations	COCs	Soil Exceedances With Respect to CSR IL Standards VPH (CSR IL) = 200 ug/g
1	Soil and groundwater contamination in vicinity of MW06-2	MW06-2, MW06-3, MW07-6, MW07-7, MW07-8, MW07-9, MW08-10, MW08-11, BH08-12, MW08-13	EPH, BTEX/VPH	**MW06-2** VPH (960 µg/g) 1.8-2.4 m **MW07-6** VPH (960 µg/g) 1.7-2.3 m **BH08-12** VPH (3000 µg/g) 1.35-1.7 m

Notes: LEPH concentrations are based on EPH_{10-19} analyses.
EPH_{10-19} concentrations are compared to LEPH standard as a conservative measure.

4.4 GROUNDWATER ANALYTICAL RESULTS

The results of the groundwater analytical program are presented in **Table 2** and **Figure 5.** The certified laboratory analytical reports are included in **Appendix B.**

Groundwater samples that exceeded the applicable CSR AW standards for one or more of the parameters analyzed are summarized in **Table C,** below. The federal guidelines were not exceeded.

Table C Groundwater Exceedances

AEC Reference Number	AEC Description	Investigation Locations	COCs	Groundwater Exceedances With Respect to CSR AW Standards		
				Monitoring Well	Date	Parameter > CSR AW VPH (CSR) = 1500 ug/L LEPH (CSR) = 500 ug/L
1	Soil and groundwater contamination in vicinity of MW06-2	MW06-2, MW06-3, MW07-6, MW07-7, MW07-8, MW07-9, MW08-10, MW08-11, MW08-13	EPH, BTEX/VPH	MW06-2	7/5/2006	VPH (2400 µg/L) LEPH (2300 µg/L)
					7/6/2007	VPH (2600 µg/L) LEPH (3000 µg/L)
					9/22/2008	LEPH (870 µg/L)
				MW07-6	8/16/2007	VPH (3600 µg/L) LEPH (2300 µg/L)
					9/22/2008	LEPH (700 µg/L)
				MW07-7	8/16/2007	VPH (1700 µg/L) LEPH (1900 µg/L)
					9/22/2008	LEPH (1900 µg/L)
				MW07-8	8/16/2007	LEPH (1400 µg/L)

Notes: LEPH concentrations are based on EPH_{10-19} analyses.
EPH_{10-19} concentrations are compared to LEPH standard as a conservative measure.

4.5 QUALITY ASSURANCE / QUALITY CONTROL

QA/QC results are provided in **Table 1** and **Table 2** (following the text) and **Appendix B** (certified laboratory analytical reports).

4.5.1 Soil

Two duplicate soil samples from the Supplemental Phase 2 ESA were analyzed. The RPD between the duplicate sample and original sample was calculated for parameters where concentrations of the sample and its duplicate were greater than five times the RDL.

The following parameters analyzed in the duplicate soil sample sets exceeded the RPD data quality objective DQO (20%):

- Moisture (23.2%), VH_{6-10} (85.7%) and VPH (85.7%) analyzed in BH08-12.3 and its duplicate sample (BH08-12.5).

The RPD values that exceeded the DQO may be attributed to the inherent heterogeneity of soil. Overall, the results of the soil samples and their duplicates above the RPD (20%) are not considered to affect the interpretation of the laboratory data and the results should be viewed with the understanding that there is some variability in the dataset. As a conservative measure, if the soil DQO was exceeded, the highest concentration (between the original sample and the field duplicate) was conservatively used.

4.5.2 Groundwater

Two duplicate groundwater samples from the Supplemental Phase 2 ESA were analyzed. The RPD between the duplicate sample and original sample was calculated for parameters where concentrations of the sample and its duplicate were greater than five times the RDL.

The following parameters analyzed in the duplicate groundwater sample sets exceeded the RPD data quality objective DQO (20%):

- Xylenes (27%) in MW07-7 and its duplicate sample (MW900/1000) in August 2007; and
- VH_{6-10} (27%) and VPH (28%) in MW07-7 and its duplicate sample (MW08-12) in September 2008.

Overall, the results of the groundwater samples and the corresponding duplicates above the RPD (20%) are not considered to affect the interpretation of the laboratory data and the results should be viewed with the understanding that there is some variability in the dataset. As a conservative measure, if the groundwater DQO was exceeded, the highest concentration (between the original sample and the field duplicate) was conservatively used.

5.0 DISCUSSION

5.1 SOIL QUALITY

VPH concentrations greater than the CSR IL standards were identified in soil collected from MW06-2, MW07-6 and BH08-12. The samples were collected from 1.35 to 2.4 m bgs, which correlates with the depth of the groundwater table in the area. Detectable concentrations of EPH, but less than the applicable standards, were identified at MW06-2 and MW07-7. The EPH impacts have been delineated (laterally and vertically). The soil samples did not contain concentrations of COCs greater than federal guidelines.

AEC-1 is situated immediately down gradient of the CN Rail Line and the former Brownsville Rail Spur (which is currently a dyke), and immediately upgradient of the current Lindal Cedar Homes warehouse and distribution building. Light industrial operations, including wood processing, wood manufacturing and shingle manufacturing are located beyond the former Brownsville Rail Spur, to the southeast of the Site. The specific source of the contamination at AEC-1 has not been identified; however, on-site operations (current or historical) and/or surrounding off-site operations could have contributed to the contamination at AEC-1. The sample collected from BH08-12 from 1.35 to 1.7 m bgs contained the greatest concentration of VPH (3000 ug/g) observed during the Phase 2 ESA delineation, and therefore appears to be near the source.

VPH contaminated soil has essentially been delineated (laterally and vertically) on-site; however, the lateral extent of VPH contamination off-site to southeast of BH08-12 is unknown.

It is estimated that approximately 400 m^3 of soil containing VPH at concentrations greater than the provincial IL standards is present within AEC-1 (estimated using boundaries of AEC-1 as shown on **Figure 4**). However, we would recommend additional investigation to confirm this number, and to further constrain the contamination extent, if a remediation plan were to be developed. An additional investigation would include drilling a number of monitoring wells within AEC-1.

5.2 GROUNDWATER QUALITY

VPH concentrations greater than CSR AW standards were identified in groundwater collected from MW06-2 (July 2006 and July 2007), MW07-6 (in August 2007), and MW07-7 (in August 2007). Groundwater samples collected in September 2008 did not exceed the CSR AW standards for VPH. Overall, VPH concentrations decreased between August 2007 and September 2008.

LEPH concentrations greater than CSR AW standards were identified in groundwater collected from MW06-2 (in July 2006, July 2007 and September 2008), MW07-6 (in August 2007 and September 2008), MW07-7 (in August 2007 and September 2008) and MW07-8 (in August 2007). Overall, LEPH concentrations decreased between August 2007 and September 2008.

The groundwater samples did not contain concentrations of COCs greater than federal guidelines.

LEPH contaminated groundwater has essentially been delineated on-site; however, the lateral extent of LEPH off-site to the southeast of BH08-12 is unknown.

6.0 CONCLUSIONS

The Supplemental Phase 2 ESA was completed to:

- Delineate soil contamination identified in vicinity of AEC-1.
- Delineate groundwater contamination identified in vicinity of AEC-1.
- Evaluate potential remedial/ Site management options for the Site.

Based on available data, the following conclusions are made:

- VPH impacted soil is present within the upper sand unit and the lower silt unit (from approximately 1.4 to 2.4 m bgs) in AEC-1. VPH contaminated soil has essentially been delineated (laterally and vertically) on-site; however, the lateral extent of VPH contamination off-site to southeast of BH08-12 is unknown.
- It is estimated that approximately 400 m^3 of soil impacted with VPH concentrations greater than the applicable provincial industrial land use (IL) standards in present within AEC-1. However, we would recommend additional investigation to confirm this number, and to further constrain the contamination extent, if a remediation plan were to be developed.
- Light extractable petroleum hydrocarbon (LEPH) contaminated groundwater was identified in MW06-2, MW07-6 and MW07-7, and has essentially been delineated on-site. A source for the contamination was not identified in upgradient monitoring well MW07-9. LEPH concentrations in groundwater decreased between July/August 2007 and September 2008.
- The groundwater samples collected in September 2008 did not exceed the applicable provincial standards for VPH.
- Based on a review of the laboratory chromatograms, the elevated VPH in soil and groundwater samples is consistent with an aromatic petroleum hydrocarbon solvent (i.e. Varsol ©).
- Overall, the contamination appears to be localized and the concentrations of VPH and LEPH in groundwater have decreased between July/August 2007 and September 2008.

7.0 NEXT STEPS

A remedial options evaluation was completed to address the contamination in support the proposed property transfer of the Site from CN to Transport Canada. The remedial options evaluation for the Site will be provided under a separate cover.

We sincerely appreciate the opportunity to have assisted you with this project and if there are any questions, please do not hesitate to contact the undersigned by phone or email.

Report prepared by:
HEMMERA

Seth Kingsbury, B.Sc., AScT, A.Ag.
Environmental Scientist

Report peer reviewed by:
HEMMERA

John Taylor, P.Eng.
Senior Environmental Engineer

8.0 REFERENCES

British Columbia Ministry of Environment, Technical Guidance on Contaminated Sites, Site Characterization and Confirmation Testing, July 2005.

British Columbia Ministry of Environment, Environmental Management Act, Contaminated Sites Regulation, B.C. Reg. 375/96, July 2004 (as amended up to B.C. Reg. 76/2005).

British Columbia Contaminated Sites Regulation (BC CSR). BC Reg. 375/96 (Effective April 1997 and amended July 1999, November 1999, February 2002, November 2003, and July 2004), including amendments up to B.C. Reg 239/2007, effective July1, 2007.

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Klohn-Crippen Consultants Ltd., Fraser River Harbour Commission, Lindal Cedar Homes Sawmill Expansion, Surrey BC - Preliminary Geotechnical and Environmental Assessments. April 1995.

Public Works and Government Services Environmental Services (PWGSC), Environmental Audit Report Brownsville/Port Mann CN Land Swap, Surrey BC. August 23, 1996.

9.0 STATEMENT OF LIMITATIONS

This report was prepared by Hemmera, based on fieldwork conducted by Hemmera, for the sole benefit and exclusive use of Vancouver Fraser Port Authority (VFPA). The material in it reflects Hemmera's best judgment in light of the information available to it at the time of preparing this Report. Any use that a third party makes of this Report, or any reliance on or decision made based on it, is the responsibility of such third parties. Hemmera accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this Report.

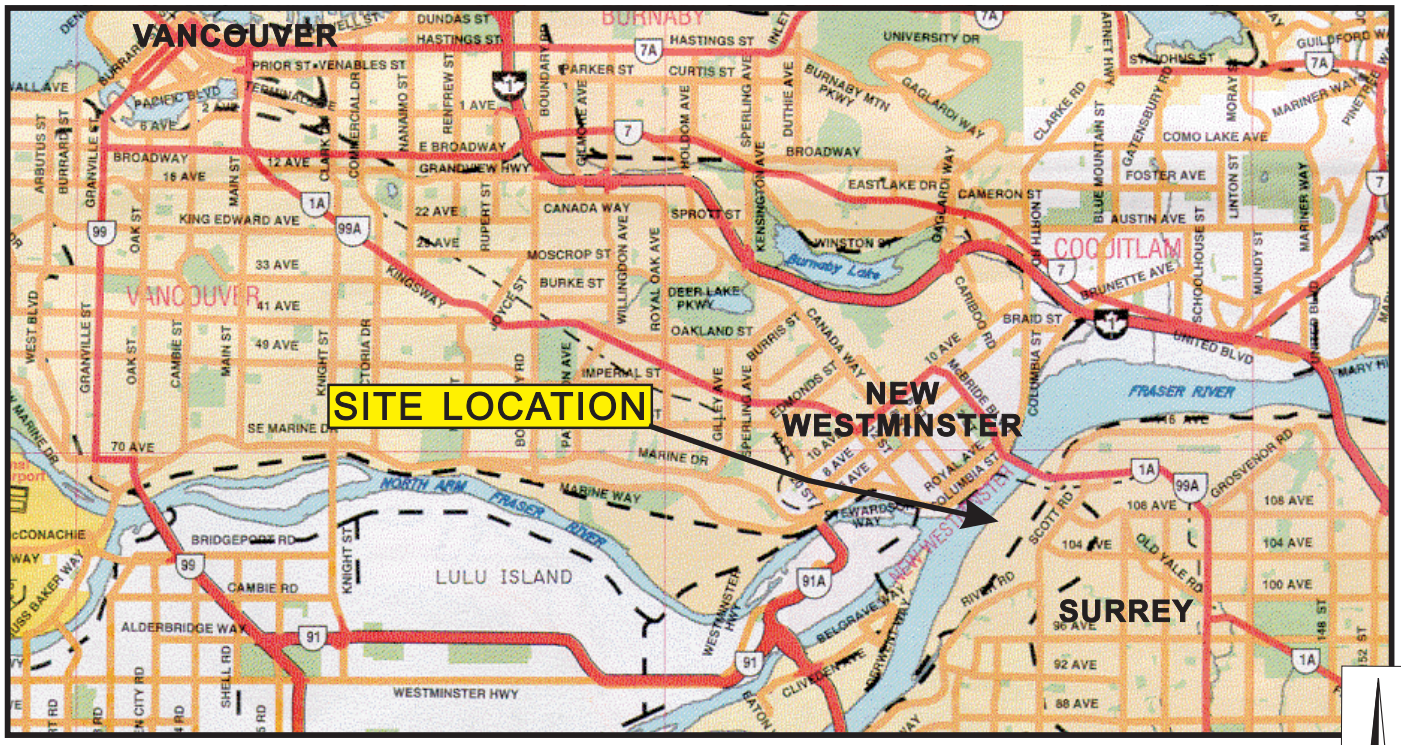
Hemmera has performed the work as described above and made the findings and conclusions set out in this Report in a manner consistent with the level of care and skill normally exercised by members of the environmental science profession practicing under similar conditions at the time the work was performed.

This Report represents a reasonable review of the information available to Hemmera within the established Scope, work schedule and budgetary constraints. It is possible that the levels of contamination or hazardous materials may vary across the Site, and hence currently unrecognised contamination or potentially hazardous materials may exist at the Site. No warranty, expressed or implied, is given concerning the presence or level of contamination on the Site, except as specifically noted in this Report. The conclusions and recommendations contained in this Report are based upon applicable legislation existing at the time the Report was drafted. Any changes in the legislation may alter the conclusions and/or recommendations contained in the Report. Regulatory implications discussed in this Report were based on the applicable legislation existing at the time this Report was written.

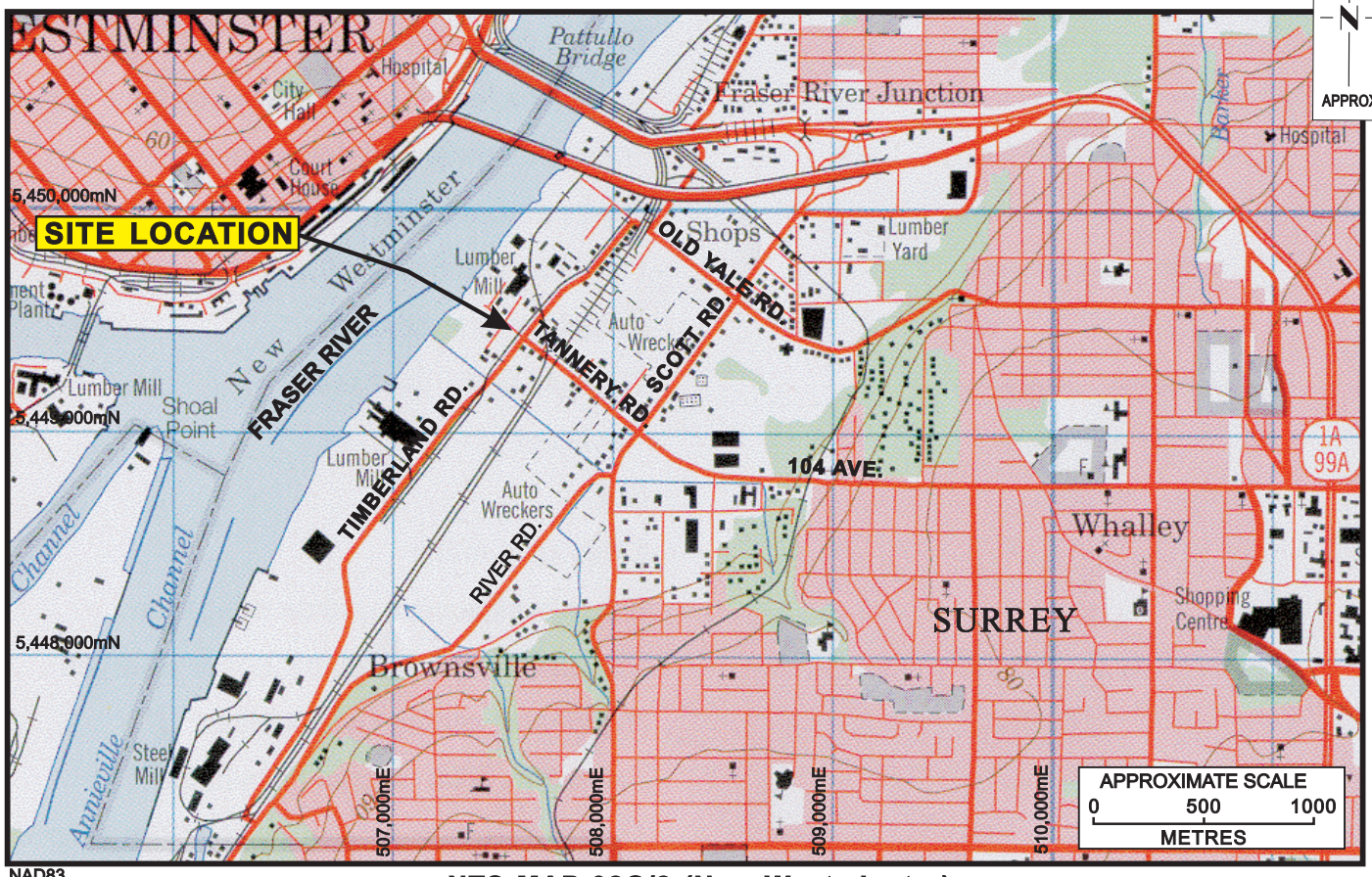
In preparing this Report, Hemmera has relied in good faith on information provided by others as noted in this Report, and has assumed that the information provided by those individuals is both factual and accurate. Hemmera accepts no responsibility for any deficiency, mis-statement or inaccuracy in this Report resulting from the information provided by those individuals.

The liability of Hemmera to VFPA shall be limited to injury or loss caused by the negligent acts of Hemmera. The total aggregate liability of Hemmera related to this agreement shall not exceed the lesser of the actual damages incurred, or the total fee of Hemmera for services rendered on this project.

FIGURES



REGIONAL MAP



NAD83

NTS MAP 92G/2 (New Westminster)

HEMMERA

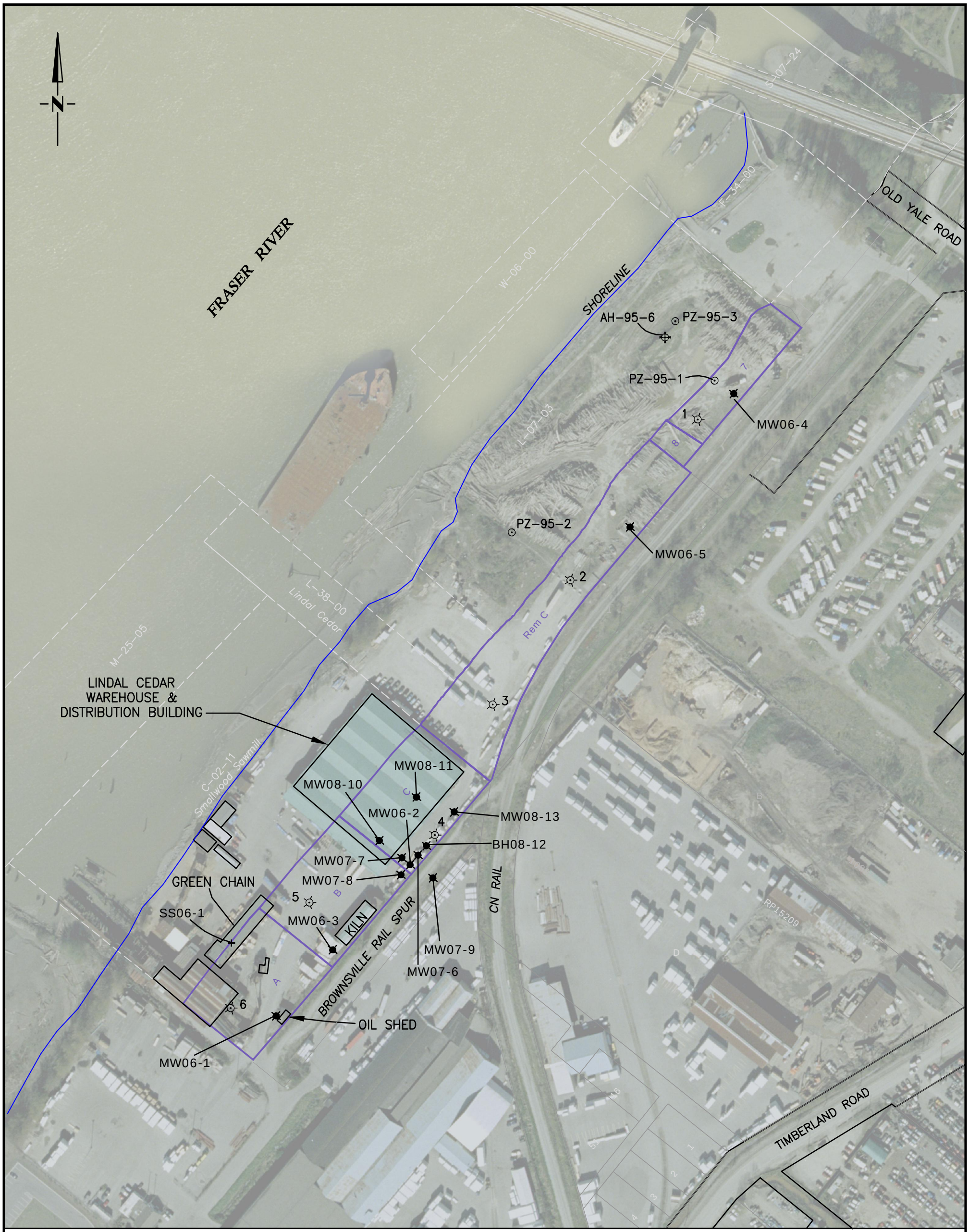
CLIENT: PORT METRO vancouver

SUPPLEMENTAL PHASE 2 ESA
BROWNSVILLE SITE, SURREY, BC

SITE LOCATION

PROJECT No.		
405-003.04	February 2009	FIGURE 1

405\003\04\



LEGEND

- ⊙ Piezometer Location (Klohn-Crippen, 1995)
- ⌖ Auger Test Hole Location (Klohn-Crippen, 1995)
- ⊙ Borehole Location (BC Research, 1991)
- ✦ Borehole/Monitoring Well Location (Hemmera, 2006, 2007 & 2008)
- \+ Surface Soil Sample (Hemmera, 2006)
- ——— Parcel & Property Boundaries
- B Parcel Number

SCALE 1:2000
metres
0 40 80

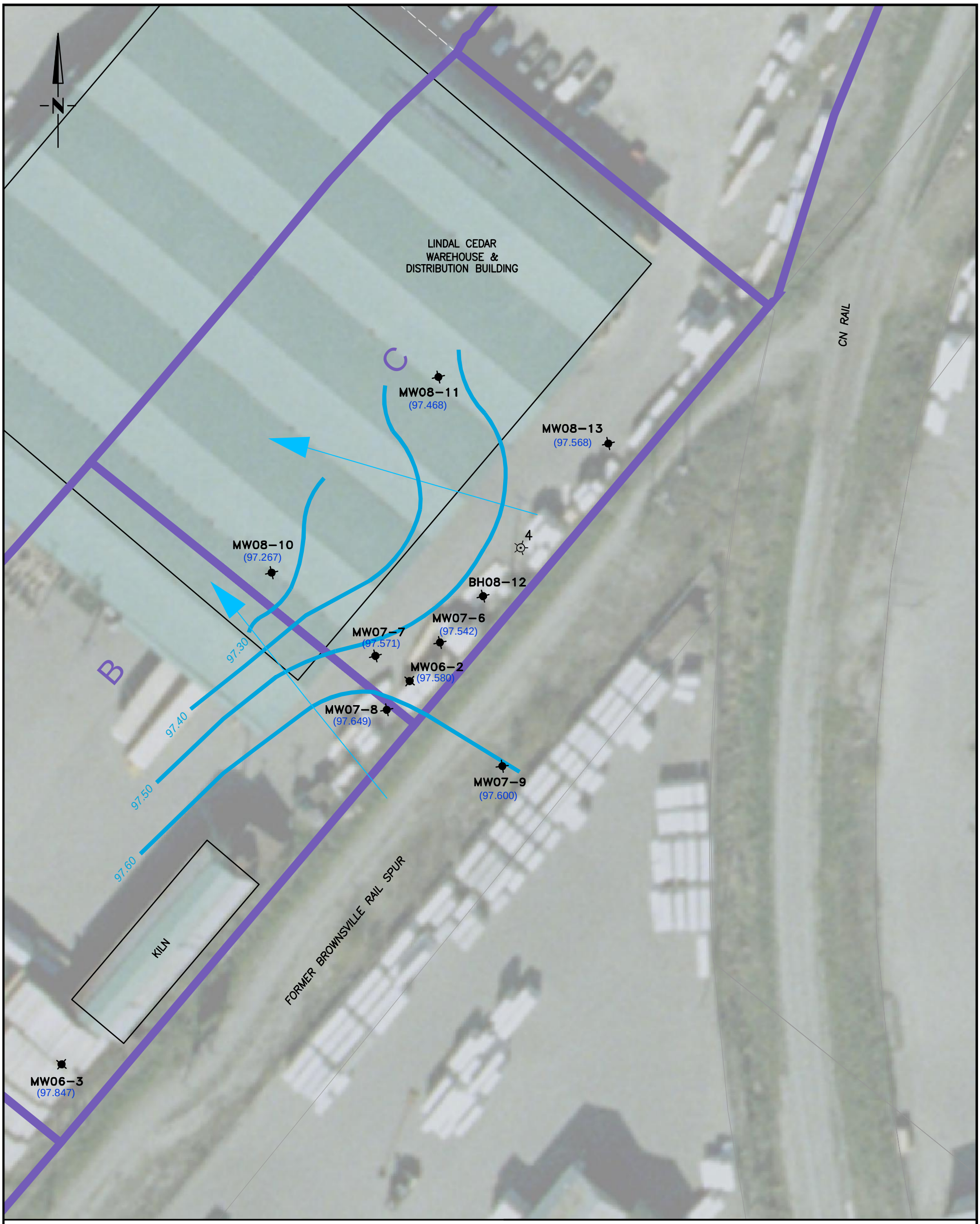
HEMMERA

CLIENT: PORT METRO vancouver

SUPPLEMENTAL PHASE 2 ESA
BROWNSVILLE SITE, SURREY, BC

SITE PLAN - INVESTIGATION LOCATIONS

PROJECT No.		
405-003.04	February 2009	FIGURE 2



LEGEND

- ⊙ Piezometer Location (Klohn-Crippen, 1995)
- ⌖ Auger Test Hole Location (Klohn-Crippen, 1995)
- ⊙ Borehole Location (BC Research, 1991)
- ✦ Borehole/Monitoring Well Location (Hemmera, 2006, 2007 & 2008)
- \+ Surface Soil Sample (Hemmera, 2006)
- Parcel & Property Boundaries
- B Parcel Number
- Inferred Groundwater Flow Direction
- *97.50* Groundwater Elevation Contour
- (97.649) Groundwater Elevation (m)

SCALE 1:450
metres
0 9 18

HEMMERA

CLIENT: PORT METRO vancouver

SUPPLEMENTAL PHASE 2 ESA
BROWNSVILLE SITE, SURREY, BC

GROUNDWATER ELEVATION CONTOURS
(SEPTEMBER 2008)

PROJECT No.		
405-003.04	February 2009	FIGURE 3

MW07-7		
Date Sampled	8/15/2007	
Sample Depth (m)	1.8-2.3	4.1-4.6
BTEX	< (nd)	< (nd)
VPH	<100	<100
EPH10-19	390	-
EPH19-32	<250	-

MW08-10		
Date Sampled	9/16/2008	
Sample Depth (m)	2.12-2.43	2.87-3.35
BTEX	< (nd)	< (nd)
VPH	<100	<100

MW06-3		
Date Sampled	6/29/2006	
Sample Depth (m)	0.30-0.91	1.52-1.98
EPH10-19	<250	<250
EPH19-32	<250	<250

MW07-8		
Date Sampled	8/15/2007	
Sample Depth (m)	2.3-2.7	3.2-3.6
BTEX	< (nd)	< (nd)
VPH	110	<100
EPH10-19	<250	-
EPH19-32	<250	-

MW08-11		
Date Sampled	9/16/2008	
Sample Depth (m)	1.5-2.0	2.75-3.05
BTEX	< (nd)	< (nd)
VPH	<100	<100

MW08-13			
Date Sampled	9/16/2008		
Sample Depth (m)	0.92-1.53	1.83-2.44	3.35-3.97
BTEX	< (nd)	< (nd)	< (nd)
VPH	<100	<100	<100

BH08-12		
Date Sampled	9/16/2008	
Sample Depth (m)	1.35-1.7	1.7-2.31
BTEX	< (nd)	< (nd)
VPH	**3000**	170

MW07-6		
Date Sampled	8/15/2007	
Sample Depth (m)	1.7-2.3	2.7-3.0
BTEX	< (nd)	< (nd)
VPH	**960**	110
EPH10-19	<250	<250
EPH19-32	<250	<250

MW07-9		
Date Sampled	8/15/2007	
Sample Depth (m)	1.7-2.3	2.7-3.0
BTEX	< (nd)	< (nd)
VPH	<100	<100
EPH10-19	<250	-
EPH19-32	<250	-

MW06-2	
Date Sampled	6/29/2006
Sample Depth (m)	1.8-2.4
BTEX	< (nd)
VPH	**960**
LEPH	970
HEPH	<250
EPH10-19	970
EPH19-32	<250

Selected CSR IL Standards	
Parameter	µg/g
BTEX	see table
EPH10-19	2000
EPH19-32	5000
LEPH	2000
HEPH	5000
VPH	200

LINDAL CEDAR WAREHOUSE & DISTRIBUTION BUILDING

CN RAIL

AEC-1

FORMER BROWNSVILLE RAIL SPUR

KILN

B

MW08-11 1.5-2.0 2.75-3.05

MW08-13 0.92-1.53 1.83-2.44 3.35-3.97

MW08-10 2.12-2.43 2.87-3.35

BH08-12 1.35-1.7 1.7-2.31

MW07-6 1.7-2.3 2.7-3.0

MW07-7 1.8-2.3 4.1-4.6

MW06-2 1.8-2.4

MW07-8 2.3-2.7 3.2-3.6

MW07-9 1.7-2.3 2.7-3.0

MW06-3 0.31-0.91 1.52-1.98

LEGEND

- Piezometer Location (Klohn-Crippen, 1995)
- Auger Test Hole Location (Klohn-Crippen, 1995)
- Borehole Location (BC Research, 1991)
- Borehole/Monitoring Well Location (Hemmera, 2006, 2007 & 2008)
- Surface Soil Sample (Hemmera, 2006)
- Parcel & Property Boundaries
- B — Parcel Number

- Sample Location with Concentration(s) Greater Than CSR Standard(s) in Soil
- Sample Location with Concentration(s) Less Than CSR Standard(s) in Soil
- Concentration Greater Than CSR Standard(s) in Soil
- 1.7-2.0 — Sample Interval (in metres) with Concentration(s) Greater Than CSR Standard(s) in Soil
- 1.7-2.0 — Sample Interval (in metres) with Concentration(s) Less Than CSR Standard(s) in Soil

SCALE 1:450
metres
0 9 18

HEMMERA

CLIENT: PORT METRO vancouver

SUPPLEMENTAL PHASE 2 ESA
BROWNSVILLE SITE, SURREY, BC

SOIL RESULTS - PETROLEUM HYDROCARBONS

PROJECT No. 405-003.04 | February 2009 | FIGURE 4

MW08-11	
Date Sampled	9/22/2008
Depth to Water (m)	1.926
BTEX	< (nd)
VPH	<100
EPH10-19/LEPH	<250*
EPH19-32/HEPH	<250*

MW08-10	
Date Sampled	9/22/2008
Depth to Water (m)	2.063
BTEX	< (nd)
VPH	<100
EPH10-19/LEPH	<250*
EPH19-32/HEPH	<250*

MW08-13	
Date Sampled	9/22/2008
Depth to Water (m)	1.952
BTEX	< (nd)
VPH	<100
EPH10-19/LEPH	<250*
EPH19-32/HEPH	<250*

MW07-7		
Date Sampled	8/16/2007	9/22/2008
Depth to Water (m)	1.289	1.779
BTEX	<	<
VPH	1700	780
EPH10-19/LEPH	1900*	1900*
EPH19-32/HEPH	<250*	<250*

MW07-6		
Date Sampled	8/16/2007	9/22/2008
Depth to Water (m)	1.632	1.888
BTEX	<	< (nd)
VPH	3600	1100
EPH10-19/LEPH	2300*	700*
EPH19-32/HEPH	<250*	<250*

MW07-8		
Date Sampled	8/16/2007	9/22/2008
Depth to Water (m)	1.379	1.739
BTEX	<	< (nd)
VPH	590	<100
EPH10-19/LEPH	1400*	<250*
EPH19-32/HEPH	<250*	<250*

MW07-9		
Date Sampled	8/16/2007	9/22/2008
Depth to Water (m)	1.30	1.39
BTEX	< (nd)	< (nd)
VPH	<100	<100
EPH10-19/LEPH	<250*	<250*
EPH19-32/HEPH	<250*	<250*

MW06-2			
Date Sampled	7/5/2006	7/6/2007	9/22/2008
Depth to Water (m)	1.589	1.475	1.845
BTEX	<	<	<
VPH	2400	2600	990
EPH10-19/LEPH	2900	3000*	870*
EPH19-32/HEPH	350	300*	<250*

MW06-3	
Date Sampled	5/7/2006
Depth to Water (m)	1.085
EPH10-19/LEPH	<250
EPH19-32/HEPH	<250

Selected CSR AW Standards	
Parameter	µg/L
BTEX	see table
EPH10-19	5000
EPH19-32	-
LEPH	500
HEPH	-
VPH	1500

LINDAL CEDAR WAREHOUSE & DISTRIBUTION BUILDING

CN RAIL

FORMER BROWNSVILLE RAIL SPUR

KILN

AEC-1

MW08-11 MW08-10 MW08-13 MW08-12 MW07-6 MW07-7 MW06-2 MW07-8 MW07-9 MW06-3

B C 4

LEGEND

- ⊙ Piezometer Location (Klohn-Crippen, 1995)
- ⌖ Auger Test Hole Location (Klohn-Crippen, 1995)
- ⊙ Borehole Location (BC Research, 1991)
- ✦ Borehole/Monitoring Well Location (Hemmera, 2006, 2007, 2008)
- \+ Surface Soil Sample (Hemmera, 2006)
- Parcel & Property Boundaries
- B Parcel Number

- Sample Location with Concentration(s) Greater Than CSR Standard(s) in Groundwater
- Sample Location with Concentration(s) Less Than CSR Standard(s) in Groundwater
- Concentration Greater Than CSR Standard(s)
- * Concentration is based on EPH_{10-19} and EPH_{19-32} analyses. EPH_{10-19} concentration is compared to LEPH standard as conservative measure.

SCALE 1:450
metres
0 9 18

HEMMERA

CLIENT: PORT METRO vancouver

SUPPLEMENTAL PHASE 2 ESA
BROWNSVILLE SITE, SURREY, BC

GROUNDWATER RESULTS
PETROLEUM HYDROCARBONS

PROJECT No.		
405-003.04	February 2009	FIGURE 5

TABLES

Table 1
Soil Analytical Results

	Location ID:		MW06-2	MW06-3		MW07-6		MW07-7				MW07-8	
	Sample ID:		MW06-2-3	MW06-3-1	MW06-3-3	MW07-6-4	MW07-6-7	MW07-7-5	Duplicate (MW600)	*RPD*	MW07-7-9	MW07-8-5	MW07-8-7
	Date Sampled:		2006-06-29	2006-06-29	2006-06-29	2007-08-15	2007-08-15	2007-08-15	2007-08-15		2007-08-15	2007-08-15	2007-08-15
Parameter	**CCME IL** [3,4]	**CSR IL** [5,6]											
Sample Info													
Sample Depth, From (m)	-	-	1.83	0.3	1.524	1.828	3.200	1.828	-	-	4.114	2.286	3.200
Sample Depth, To (m)	-	-	2.44	0.91	1.98	2.286	3.657	2.286	-	-	4.57	2.743	3.657
Field Tests													
Field Vapours (% LEL)	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Vapours (ppm)	-	-	520	60	150	405	500	>500	-	-	150	450	100
Physical Tests													
Moisture (%)	-	-	26.9	17.9	35.8	26.8	26.7	25.2	25.1	-	29	25.6	28.1
BTEX													
Benzene	0.0068-0.030 [7]	2.5 [12]	<0.03 [16]	-	-	<0.04 [16]	<0.04 [16]	<0.04 [16]	<0.04 [16]	-	<0.04 [16]	<0.04 [16]	<0.04 [16]
Ethylbenzene	0.018-0.082 [8]	20 [13]	<0.03 [16]	-	-	<0.5 [16]	<0.5 [16]	<0.5 [16]	<0.5 [16]	-	<0.5 [16]	<0.5 [16]	<0.5 [16]
Styrene	50 [9]	50 [14]	<0.03	-	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1
Toluene	0.08-0.37 [10]	25 [13]	<0.03	-	-	<0.5 [16]	<0.5 [16]	<0.5 [16]	<0.5 [16]	-	<0.5 [16]	<0.5 [16]	<0.5 [16]
Xylenes	2.4-11 [11]	50 [13]	<0.03	-	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1
EPHs													
EPH10-19 (Si-gel)	-	2000 [15]	970	<250	<250	770	-	390	-	-	-	<250	-
EPH19-32 (Si-gel)	-	5000 [15]	<250	<250	<250	<250	-	<250	-	-	-	<250	-
LEPH (Si-gel)	-	2000 [14]	970	-	-	-	-	-	-	-	-	-	-
HEPH (Si-gel)	-	5000 [14]	<250	-	-	-	-	-	-	-	-	-	-
VPHs													
VH6-10	-	-	960	-	-	960	110	<100	<100	-	<100	110	<100
VPH	-	200 [14]	**960**	-	-	**960**	110	<100	<100	-	<100	110	<100

Table 1
Soil Analytical Results

	Location ID:		MW07-9	MW07-9	MW08-10		MW08-11		BH08-12				MW08-13		
	Sample ID:		MW07-9-3	MW07-9-5	MW08-10.3	MW08-10.4	MW08-11.2	MW08-11.4	BH08-12.3	Duplicate (BH08-12.5)	*RPD*	BH08-12.4	MW08-13.2	MW08-13.4	MW08-13.5
	Date Sampled:		2007-08-15	2007-08-15	2008-09-16	2008-09-16	2008-09-16	2008-09-16	2008-09-16	2008-09-16		2008-09-16	2008-09-16	2008-09-16	2008-09-16
Parameter	**CCME IL** [3,4]	**CSR IL** [5,6]													
Sample Info															
Sample Depth, From (m)	-	-	1.700	2.667	2.12	2.87	1.5	2.75	1.35	1.35	-	1.7	0.92	1.83	3.35
Sample Depth, To (m)	-	-	2.286	3.048	2.43	3.35	2	3.04	1.7	1.7	-	2.31	1.53	2.44	3.97
Field Tests															
Field Vapours (% LEL)	-	-	-	-	-	-	-	-	10	10	-	5	-	-	-
Field Vapours (ppm)	-	-	150	200	60	50	50	30	-	-	-	-	140	35	30
Physical Tests															
Moisture (%)	-	-	27.6	26.1	25	23.5	21.3	25.1	28.9	22.9	*23.2*	25.7	15.6	27.8	26.4
BTEX															
Benzene	0.0068-0.030 [7]	2.5 [12]	<0.04 [16]	<0.04 [16]	<0.04 [16]	<0.04 [16]	<0.04 [16]	<0.04 [16]	<0.04 [16]	<0.04 [16]	-	<0.04 [16]	<0.04 [16]	<0.04 [16]	<0.04 [16]
Ethylbenzene	0.018-0.082 [8]	20 [13]	<0.5 [16]	<0.5 [16]	<0.5 [16]	<0.5 [16]	<0.5 [16]	<0.5 [16]	<0.5 [16]	<0.5 [16]	-	<0.5 [16]	<0.5 [16]	<0.5 [16]	<0.5 [16]
Styrene	50 [9]	50 [14]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1
Toluene	0.08-0.37 [10]	25 [13]	<0.5 [16]	<0.5 [16]	<0.5 [16]	<0.5 [16]	<0.5 [16]	<0.5 [16]	<0.5 [16]	<0.2	-	<0.5 [16]	<0.5 [16]	<0.5 [16]	<0.5 [16]
Xylenes	2.4-11 [11]	50 [13]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	-	<0.1	<0.1	<0.1	<0.1
EPHs															
EPH10-19 (Si-gel)	-	2000 [15]	<250	-	-	-	-	-	-	-	-	-	-	-	-
EPH19-32 (Si-gel)	-	5000 [15]	<250	-	-	-	-	-	-	-	-	-	-	-	-
LEPH (Si-gel)	-	2000 [14]	-	-	-	-	-	-	-	-	-	-	-	-	-
HEPH (Si-gel)	-	5000 [14]	-	-	-	-	-	-	-	-	-	-	-	-	-
VPHs															
VH6-10	-	-	<100	<100	<100	<100	<100	<100	1200	3000	*85.7*	170	<100	<100	<100
VPH	-	200 [14]	<100	<100	<100	<100	<100	<100	**1200**	**3000**	*85.7*	170	<100	<100	<100

Table 1
Soil Analytical Results

(1) All values are reported as µg/g unless otherwise noted
(2) - = No standard or not analyzed
(3) CCME = Canadian Council of Ministers of the Environment, Canadian Environmental Quality Guidelines, 1999, updated to December 2007 (v7.1)
(4) CCME IL = Chapter 7, Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health, Summary Tables 1 and 2, Industrial land use, Update 7.0 September 2007
(5) CSR = BC Environmental Management Act, Contaminated Sites Regulation, B.C. Reg. 375/96, including amendments up to B.C. Reg. 239/2007, effective July 1, 2007
(6) CSR IL = Schedules 4 (Generic) and/or 5 (Matrix), Column VI Industrial, and/or Schedule 10, Column IV, Commercial, Industrial Soil Standard
(7) Benzene varies with Median grain size in µm as follows for CCME IL, Table 1, Canadian Soil Quality Guidelines:
    0.0068 if Median grain size<=75
    0.030 if Median grain size>75
(8) Ethylbenzene varies with Median grain size in µm as follows for CCME IL, Table 1, Canadian Soil Quality Guidelines:
    0.018 if Median grain size<=75
    0.082 if Median grain size>75
(9) Table 2, Interim remediation criteria for soil that have not yet been replaced by Canadian Soil Quality Guidelines
(10) Toluene varies with Median grain size in µm as follows for CCME IL, Table 1, Canadian Soil Quality Guidelines:
    0.08 if Median grain size<=75
    0.37 if Median grain size>75
(11) Xylenes varies with Median grain size in µm as follows for CCME IL, Table 1, Canadian Soil Quality Guidelines:
    2.4 if Median grain size<=75
    11 if Median grain size>75
(12) Schedule 5, Environmental Protection, Groundwater flow to surface water used by aquatic life, Marine
(13) Schedule 5, Environmental Protection, Toxicity to soil invertebrates and plants
(14) Schedule 4, Generic Numerical Soil Standards
(15) BC Ministry of Water, Land and Air Protection, Director of Waste Management, May 23, 2003, Update on Contaminated Sites, Clarification on Hydrocarbon Analytical Methods and Standards; the Director has extended the EPH/LEPH/HEPH equivalency to July 1, 2010; therefore, EPH concentrations not corrected for PAHs have been conservatively compared to the LEPH/HEPH standards
(16) The laboratory reported detection limit is greater than the standard/guideline
(17) Si-gel = silica-gel clean-up

Table 2
Groundwater Analytical Results

			Location ID:	MW06-2			MW06-3	MW07-6		MW07-7			
			Sample ID:	MW06-2	MW06-2	MW06-2	MW06-3	MW07-6	MW07-6	MW07-7	Duplicate (MW900/1000)	*RPD* [10]	MW07-7
			Date Sampled:	7/5/2006	7/6/2007	9/22/2008	5/7/2006	8/16/2007	9/22/2008	8/16/2007	8/16/2007		9/22/2008
Parameter	**CCME MALx10** [11,12]	**CCME FALx10** [11,13]	**CSR AW** [3,4]										
Sample Info													
Well Depth, To Bottom (m)	-	-	-	2.763	2.77	2.745	2.773	2.958	2.958	3.51	-	-	3.5
Well Depth, To Water (m)	-	-	-	1.589	1.475	1.845	1.085	1.632	1.888	1.284	-	-	1.779
Field Tests													
Field Conductivity (uS/cm)	-	-	-	640	20	780	321	-	545.7	-	-	-	752
Field pH	-	-	-	6.31	6.62	6.43	6.54	-	6.16	-	-	-	6.29
Field Temperature (ºC)	-	-	-	14.8	15.2	15	17.4	-	15.5	-	-	-	17.6
Field Vapours (% LEL)	-	-	-	-	-	-	-	-	-	-	-	-	25
Field Vapours (ppm)	-	-	-	0	25	50	0	-	50	-	-	-	-
BTEX													
Benzene	1100	3700	1000 [5]	<0.5	3	5.8	-	<0.5	<0.1	<1	1.9	-	1.9
Ethylbenzene	250	900	2000 [6]	0.7	1.1	1.1	-	1.2	<0.1	<1	0.8	-	0.6
Styrene	-	720	720 [7]	<0.5	<0.5	<0.1	-	<0.5	<0.1	<1	<0.1	-	<0.1
Toluene	2150	20	390 [6]	<0.5	3	2.8	-	<0.5	<0.1	1.7	1.8	*6*	1.7
Xylenes	-	-	-	2.5	2.8	2.9	-	4.4	<0.1	2.9	3.8	*27*	2.6
EPHs													
EPH10-19	-	-	5000 [7]	**2900**	**3000** [9]	**870** [8,9]	<250 [8]	**2300** [9]	**700** [8,9]	**1700** [9]	**1900** [9]	*11*	**1700** [8,9]
EPH19-32	-	-	-	350	330	<250 [8]	<250	<250	<250 [8]	300	<250	-	<250 [8]
LEPH	-	-	500 [7]	**2900**	-	-	<250	-	-	-	-	-	-
HEPH	-	-	-	350	-	-	<250	-	-	-	-	-	-
VPHs													
VH6-10	-	-	15000 [7]	2400	2600	1000	-	3600	1100	1700	1400	*19*	600
VPH	-	-	1500 [7]	**2400**	**2600**	990	-	**3600**	1100	**1700**	1400	*19*	590

Table 2
Groundwater Analytical Results

			Location ID:			MW07-8		MW07-9		MW08-10	MW08-11	MW08-13
			Sample ID:	Duplicate (MW08-12)	*RPD* [10]	MW07-8	MW07-8	MW07-9	MW07-9	MW08-10	MW08-11	MW08-13
			Date Sampled:	9/22/2008		8/16/2007	9/22/2008	8/16/2007	9/22/2008	9/22/2008	9/22/2008	9/22/2008
Parameter	**CCME MALx10** [11,12]	**CCME FALx10** [11,13]	**CSR AW** [3,4]									
Sample Info												
Well Depth, To Bottom (m)	-	-	-	3.5	-	3.014	3.006	2.232	2.258	3.799	3.714	3.964
Well Depth, To Water (m)	-	-	-	1.779	-	1.379	1.739	1.3	1.385	2.063	1.926	1.952
Field Tests												
Field Conductivity (uS/cm)	-	-	-	752	-	-	297.4	-	467.1	1101	604	482.5
Field pH	-	-	-	6.29	-	-	5.93	-	6.5	6.37	6.5	6.2
Field Temperature (ºC)	-	-	-	17.6	-	-	15.1	-	14.9	14.7	14.7	15.6
Field Vapours (% LEL)	-	-	-	25	-	-	-	-	-	-	-	-
Field Vapours (ppm)	-	-	-	-	-	-	50	-	25	45	40	425
BTEX												
Benzene	1100	3700	1000 [5]	2.1	*10*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	250	900	2000 [6]	0.6	*0*	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Styrene	-	720	720 [7]	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	2150	20	390 [6]	2	*16*	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylenes	-	-	-	2.7	*4*	2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EPHs												
EPH10-19	-	-	5000 [7]	1900 [8,9]	-	1400 [9]	<250 [8, 9]	<250 [8, 9]	<250 [8, 9]	<250 [8, 9]	<250 [8, 9]	<250 [8, 9]
EPH19-32	-	-	-	<250 [8]	-	<250	<250 [8]	<250 [8]	<250 [8]	<250 [8]	<250 [8]	<250 [8]
LEPH	-	-	500 [7]	-	-	-	-	-	-	-	-	-
HEPH	-	-	-	-	-	-	-	-	-	-	-	-
VPHs												
VH6-10	-	-	15000 [7]	790	*27*	590	<100	<100	<100	<100	<100	<100
VPH	-	-	1500 [7]	780	*28*	590	<100	<100	<100	<100	<100	<100

Table 2
Groundwater Analytical Results
NOTES

(1) All values are reported as µg/L unless otherwise noted
(2) - = No standard or not analyzed
(3) CSR = BC Environmental Management Act, Contaminated Sites Regulation, B.C. Reg. 375/96, including amendments up to B.C. Reg. 239/2007, effective July 1, 2007
(4) CSR AW = Schedule 6, Column II Aquatic Life
(5) Schedule 6, Generic Numerical Water Standards, Standard to protect marine and/or estuarine aquatic life (Schedule 6, Note 8)
(6) Schedule 6, Generic Numerical Water Standards, Standard to protect freshwater aquatic life (Schedule 6, Note 6)
(7) Schedule 6, Generic Numerical Water Standards
(8) Silica-Gel clean-up conducted
(9) EPH10-19 value is compared to LEPH standard (500 µg/L) as a conservative measure
(10) *RPD = Relative Percent Difference (%)*
(11) CCME = Canadian Council of Ministers of the Environment, Canadian Environmental Quality Guidelines, 1999, updated to January 2006
(12) CCME MALx10 = Chapter 4, Canadian Water Quality Guidelines for the Protection of Aquatic Life, Summary Table, Marine, Update 7.0, September 2007; all values multiplied by an assumed 10x dilution factor for groundwater entering surface water body
(13) CCME FALx10 = Chapter 4, Canadian Water Quality Guidelines for the Protection of Aquatic Life, Summary Table, Freshwater Update 7.0, September 2007; all values multiplied by an assumed 10x dilution factor for groundwater entering surface water body

APPENDIX A

Borehole/Monitoring Well Logs

HEMMERA LOGS

PVC Casing: all casing is Schedule 40, 50 mm (2") diameter unless otherwise stated.

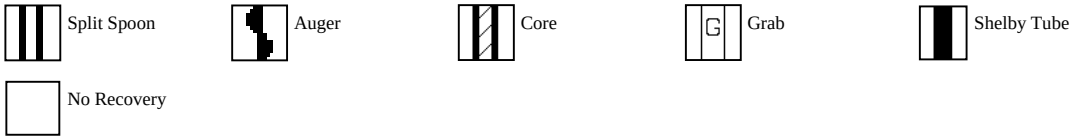
PVC slot screen: slot size is 0.25 mm (0.01" / 10 slot) unless otherwise stated.

TOC: Top of Casing

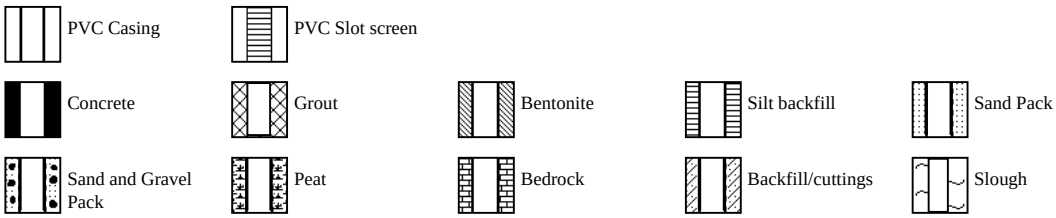
Density/Consistency: If no field test has been performed, inverted brackets are placed around the description (e.g. 'medium dense')

Duplicate samples: in the 'Samples Analysed' column, if an asterisk appears next to Y (yes) a duplicate of that sample has been analysed (i.e. Y*)

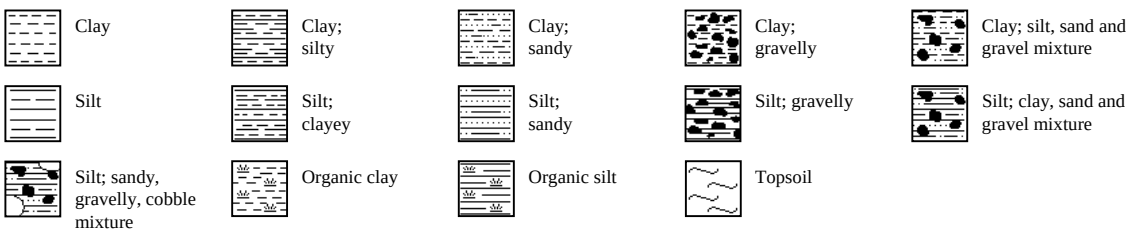
Sample Type Symbols



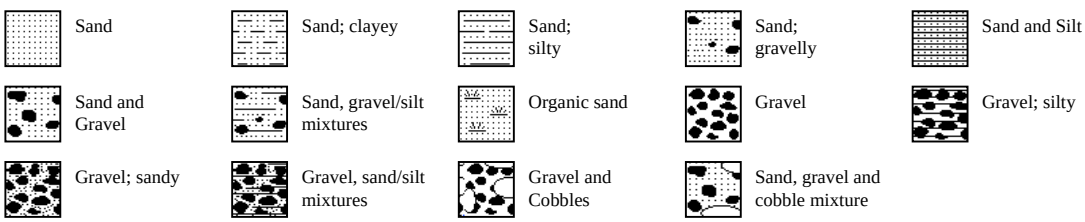
Well Symbols



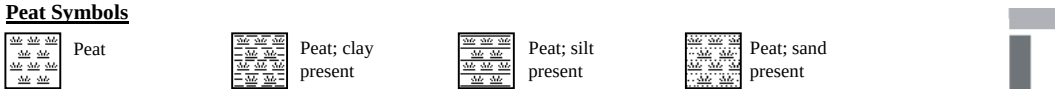
Fine Soil Description Symbols



Coarse Soil Description Symbols



Peat Symbols



Other Symbols

HEMMERA

Log of Monitoring Well: MW07-6

Project Name/No: Brownsville Phase 2 / 405-003.04

Client: PMV

Date Drilled: August 15, 2007

Site Location: Surrey, BC

Drilling Company: Rocky Mountain Soil Sampling

Drilling Method: Solid Stem Augering

Logged by: CMI

HEMMERA

Sheet: 1 of 1

SUBSURFACE PROFILE

SAMPLE

Depth (ft / m)	Symbol	Description	Depth/Elev (m)	Sample ID	Analysed Y,N	Sample Type	Vapour ppm (0 250 500)	LEL % (0 50 100)	Backfill details
0		Ground Surface	99.50						
0		**ASPHALT and GRAVEL FILL**	0.00 99.35						
1		**SAND** sand (medium to fine grained), trace silt, brown, loose, poorly graded, moist, no odour, no staining	0.15	MW07-6-1	N		55		
3 (1)		**SILT** silt, trace sand (fine grained), trace clay, dark grey, medium stiff, poorly graded, moist to wet, PHC odour, no staining, peat observed at 0.96 m	98.59 0.91	MW07-6-2	N		250		
5				MW07-6-3	N		395		
6 (2)				MW07-6-4	Y		405		
8				MW07-6-5	N		325		
9				MW07-6-6	N		460		
10 (3)				MW07-6-7	Y		500		
12		End of Log	95.84 3.66						
13 (4)									
16									

Well location: MW07-6

Depth to water level (TOC): 1.623 m

Date of water level: August 15, 2007

Borehole diameter: 15 cm

Well casing diameter: 5 cm

Well casing material: PVC

Well screen slot size: 0.025 cm

Well screen interval (bgs): 0.61 to 3.05 m

Depth of well (TOC): 2.973 m

Well Elevation (TOC): 99.430 m

Ground Elevation: 99.500 m

Log of Monitoring Well: MW07-7

Project Name/No: Brownsville Phase 2 / 405-003.04

Client: PMV

Date Drilled: August 15, 2007

Site Location: Surrey, BC

Drilling Company: Rocky Mountain Soil Sampling

Drilling Method: Solid Stem Augering

Logged by: CMI

HEMMERA

Sheet: 1 of 1

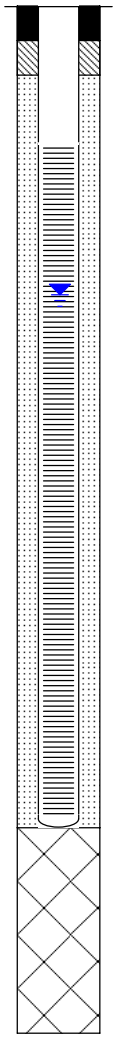
SUBSURFACE PROFILE

Depth (ft / m)	Symbol	Description	Depth/Elev (m)
		Ground Surface	99.41
0		**ASPHALT and GRAVEL FILL**	0.00 / 99.26
1		**SAND** sand (medium to fine grained), trace silt, brown, loose, poorly graded, moist, no odour, no staining	0.15
3 / 1		**SILT** silt, trace sand (fine grained), dark grey, firm, poorly graded, moist to wet, PHC odour, no staining, wood fragments observed from 0.91 and 1.52 m	98.50 / 0.91
15 / 4		End of Log	94.84 / 4.57

SAMPLE

Sample ID	Analysed Y,N	Sample Type	Vapour ppm (0 250 500)	LEL % (0 50 100)
MW07-7-1	N		250	
MW07-7-2	N		250	
MW07-7-3	N		400	
MW07-7-4	N		475	
MW07-7-5	Y		500	
MW07-7-6	N		425	
MW07-7-7	N		295	
MW07-7-8	N		150	
MW07-7-9	Y		150	

Backfill details



Well location: MW07-7

Depth to water level (TOC): 1.284 m

Date of water level: August 15, 2007

Borehole diameter: 15 cm

Well casing diameter: 5 cm

Well casing material: PVC

Well screen slot size: 0.025 cm

Well screen interval (bgs): 0.61 to 3.66 m

Depth of well (TOC): 3.519 m

Well Elevation (TOC): 99.350 m

Ground Elevation: 99.410 m

Log of Monitoring Well: MW07-8

Project Name/No: Brownsville Phase 2 / 405-003.04

Client: PMV

Date Drilled: August 15, 2007

Site Location: Surrey, BC

Drilling Company: Rocky Mountain Soil Sampling

Drilling Method: Solid Stem Augering

Logged by: CMI

HEMMERA

Sheet: 1 of 1

SUBSURFACE PROFILE

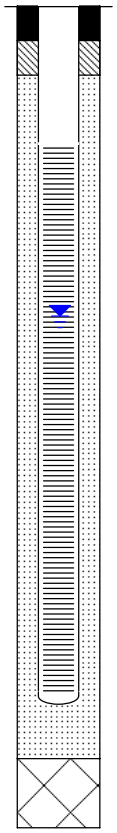
Depth (ft / m)	Description	Depth/Elev (m)
	Ground Surface	99.43
0	**ASPHALT and GRAVEL FILL**	0.00 / 99.28
0 – 1	**SAND** sand (medium to fine grained), trace silt, brown, loose, poorly graded, moist, no odour, no staining	0.15
1 – 3	**SILTY SAND** sand (medium to coarse grained), silty, brown, loose, poorly graded, no odour, no staining	0.91 / 98.52
3 – 12	**SILT** silt, trace sand (medium to fine grained), dark grey, medium stiff, poorly graded, moist to wet, PHC odour, no staining, wood fragments observed, orange mottling from 1.32 to 2.74 m	1.32 / 98.11
12	End of Log	3.66 / 95.78

SAMPLE

Sample ID	Analysed Y,N	Sample Type	Vapour ppm	LEL %
MW07-8-1	N		25	
MW07-8-2	N		95	
MW07-8-3	N		350	
MW07-8-4	N		200	
MW07-8-5	Y		450	
MW07-8-6	N		130	
MW07-8-7	Y		100	

Vapour ppm: 0 250 500 | LEL %: 0 50 100

Backfill details



Well location: MW07-8

Depth to water level (TOC): 1.379 m

Date of water level: August 15, 2007

Borehole diameter: 15 cm

Well casing diameter: 5 cm

Well casing material: PVC

Well screen slot size: 0.025 cm

Well screen interval (bgs): 0.61 to 3.05 m

Depth of well (TOC): 3.014 m

Well Elevation (TOC): 99.433 m

Ground Elevation: 99.500 m

Log of Monitoring Well: MW07-9

Project Name/No: Brownsville Phase 2 / 405-003.04

Client: PMV

Date Drilled: August 15, 2007

Site Location: Surrey, BC

Drilling Company: Rocky Mountain Soil Sampling

Drilling Method: Pionjar

Logged by: CMI

HEMMERA

Sheet: 1 of 1

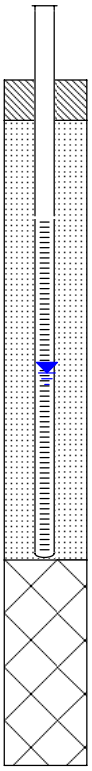
SUBSURFACE PROFILE

Depth (ft)	Depth (m)	Symbol	Description	Depth/Elev (m)
			Ground Surface	98.52
0 – 5	0 – 1		**SAND** sand (medium to coarse grained), brown, loose, poorly graded, moist, no odour, no staining, cobbles and roots at surface	0.00
5 – 6	1 – 2		**SILT** silt, trace sand (medium to fine grained), dark grey, firm, poorly graded, moist to wet, no odour, no staining, wood fragments observed from 1.83 to 2.23 m	96.81 1.70
6 – 12	2 – 3		**SANDY SILT** sand (fine to coarse grained), dark grey, firm, wet, no odour, no staining, wood fragments observed from 2.8 to 3.0 m	96.23 2.29
			End of Log	94.86 3.66

SAMPLE

Sample ID	Analysed Y,N	Sample Type	Vapour ppm (0 250 500)	LEL % (0 50 100)
MW07-9-1	N		65	
MW07-9-2	N		100	
MW07-9-3	Y		150	
MW07-9-4	N		80	
MW07-9-5	Y		200	

Backfill details



Well location: MW07-9

Depth to water level (TOC): 1.300 m

Date of water level: August 15, 2007

Borehole diameter: 5 cm

Well casing diameter: 2.5 cm

Well casing material: PVC

Well screen slot size: 0.025 cm

Well screen interval (bgs): 0.61 to 2.13 m

Depth of well (TOC): 2.232 m

Well Elevation (TOC): 98.515

Ground Elevation: 98.515

Log of Monitoring Well: MW08-10

Project Name/No: Brownsville Phase 2 / 405-003.04

Client: PMV

Date Drilled: September 16, 2008

Site Location: Surrey, BC

Drilling Company: Beck Drilling

Drilling Method: Solid Stem Augering

Logged by: AN

HEMMERA

Sheet: 1 of 1

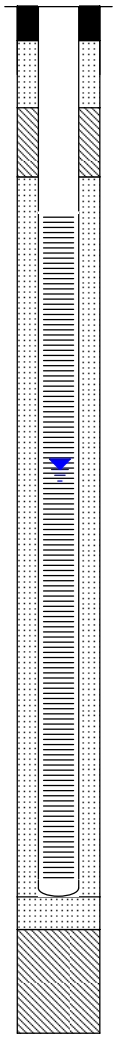
SUBSURFACE PROFILE

Depth (ft / m)	Symbol	Description	Depth/Elev (m)
		Ground Surface	99.43
0		**ASPHALT and GRAVEL FILL**	0.00 / 99.28
1		**SAND** sand (medium to fine grained), trace silt, yellowish brown, medium dense, homogeneous, dry to moist, no odour, no staining, black mottling at 0.45 m	0.15
2			
3			
4			
5			
6			97.60 / 1.83
7		**SAND** sand (medium to fine grained), trace silt, dark grey, medium dense, homogeneous, moist to wet, no odour, no staining, wood fragments observed at 2.6 m	
8			
9			96.54 / 2.90
10		**SILT** silt, some sand (medium to fine grained), dark grey, soft, homogeneous, wet, no odour, no staining	
11			
12			
13			
14			
15			94.86 / 4.57
		End of Log	
16			

SAMPLE

Sample ID	Analysed Y,N	Sample Type	Vapour ppm (0 250 500)	LEL % (0 50 100)
MW08-10-1	N		25	
MW08-10-2	N		30	
MW08-10-3	Y		60	
MW08-10-4	Y		50	

Backfill details



Well location: MW08-10

Depth to water level (TOC): 2.063 m

Date of water level: September 22, 2008

Borehole diameter: 15 cm

Well casing diameter: 5 cm

Well casing material: PVC

Well screen slot size: 0.025 cm

Well screen interval (bgs): 0.91 to 3.96 m

Depth of well (TOC): 4.57 m

Well Elevation (TOC): 99.330 m

Ground Elevation: 99.467 m

Log of Monitoring Well: MW08-11

Project Name/No: Brownsville Phase 2 / 405-003.04

Client: PMV

Date Drilled: September 16, 2008

Site Location: Surrey, BC

Drilling Company: Beck Drilling

Drilling Method: Hollow/Solid Stem Augering

Logged by: AN

HEMMERA

Sheet: 1 of 1

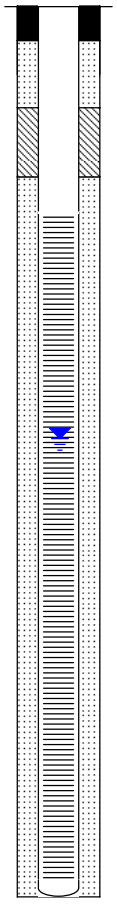
SUBSURFACE PROFILE

Depth (ft / m)	Symbol	Description	Depth/Elev (m)
		Ground Surface	99.45
0		**ASPHALT and GRAVEL FILL**	0.00 / 99.30
1		**SAND** sand (medium to fine grained), trace silt, yellowish brown, medium dense, homogeneous, dry to moist, no odour, no staining	0.15
3 / 1		**SAND** sand (medium to fine grained), trace silt, dark grey, medium dense, homogeneous, moist to wet, no odour, no staining, wood fragments and peat observed from 2.6 to 3.05 m	98.53 / 0.91
9 / 2		**SILT** silt, some sand (medium to fine grained), dark grey, soft, homogeneous, wet, no odour, no staining	96.71 / 2.74
13 / 4		End of Log	95.49 / 3.96

SAMPLE

Sample ID	Analysed Y,N	Sample Type	Vapour ppm (0 250 500)	LEL % (0 50 100)
MW08-11-1	N		10	
MW08-11-2	Y		50	
MW08-11-3	N		50	
MW08-11-4	Y		30	

Backfill details



Well location: MW08-11

Depth to water level (TOC): 1.926 m

Date of water level: September 22, 2008

Borehole diameter: 15 cm

Well casing diameter: 5 cm

Well casing material: PVC

Well screen slot size: 0.025 cm

Well screen interval (bgs): 0.91 to 3.96 m

Depth of well (TOC): 3.96 m

Well Elevation (TOC): 99.394 m

Ground Elevation: 99.449 m

Log of Borehole: BH08-12

Project Name/No: Brownsville Phase 2 / 405-003.04

Client: PMV

Date Drilled: September 16, 2008

Site Location: Surrey, BC

Logged by: AN

Drilling Method: Solid Stem Augering

Drilling Company: Beck Drilling

HEMMERA

Sheet: 1 of 1

SUBSURFACE PROFILE				SAMPLE					
Depth (ft / m)	Symbol	Description	Depth/Elev (m)	Sample ID	Analysed Y,N	Sample Type	Vapour ppm (0 250 500)	LEL % (0 50 100)	Backfill details
		Ground Surface	99.51						
		ASPHALT and GRAVEL FILL	0.00 99.36						
		SAND sand (medium to fine grained), trace silt, yellowish brown, medium dense, homogeneous, dry to moist, no odour, no staining	0.15 98.60	BH08-12-1	N		25		
1		**SAND** sand (medium to fine grained), trace silt, dark grey, medium dense, homogeneous, moist, PHC odour, black staining at 0.9 m	0.91 97.83	BH08-12-2 BH08-12-3	N Y			5.0 10.0	
2		**SILT** silt, some sand (medium to fine grained), dark grey, soft, homogeneous, moist to wet, PHC odour, no staining, wood fragments at 1.8 to 2.4 m	1.68 96.46	BH08-12-4	Y			5.0	
3		End of Log	3.05						
4									

Borehole location: BH08-12

Borehole ground elevation: 99.510 m

Borehole diameter: 15 cm

Borehole depth: 3.05 m

Log of Monitoring Well: MW08-13

Project Name/No: Brownsville Phase 2 / 405-003.04

Client: PMV

Date Drilled: September 16, 2008

Site Location: Surrey, BC

Drilling Company: Beck Drilling

Drilling Method: Solid Stem Augering

Logged by: AN

HEMMERA

Sheet: 1 of 1

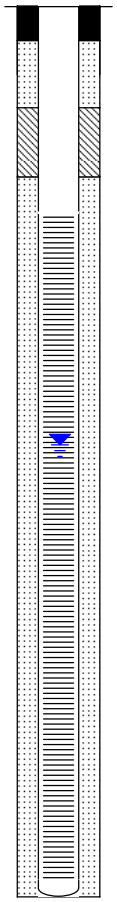
SUBSURFACE PROFILE

Depth (ft / m)	Symbol	Description	Depth/Elev (m)
		Ground Surface	99.57
0		**ASPHALT and GRAVEL FILL**	0.00 / 99.42
1		**SAND** sand (medium to fine grained), trace silt, trace gravel, yellowish brown, medium dense, homogeneous, dry to moist, no odour, no staining	0.15
3 / 1		**SAND** sand (medium to fine grained), trace silt, trace gravel, dark grey, medium dense, poorly graded, moist to wet, no odour, no staining	98.66 / 0.91
6 / 2		**SILT** silt, some sand (medium to fine grained), dark grey, soft, homogeneous, wet, no odour, no staining, peat observed at 1.85 m	97.74 / 1.83
13 / 4		End of Log	95.61 / 3.96

SAMPLE

Sample ID	Analysed Y,N	Sample Type	Vapour ppm (0 250 500)	LEL % (0 50 100)
MW08-13-1	N		20	
MW08-13-2	Y		140	
MW08-13-3	N		80	
MW08-13-4	Y		35	
MW08-13-5	Y		30	

Backfill details



Well location: MW08-13

Depth to water level (TOC): 1.952 m

Date of water level: September 22, 2008

Borehole diameter: 15 cm

Well casing diameter: 5 cm

Well casing material: PVC

Well screen slot size: 0.025 cm

Well screen interval (bgs): 0.91 to 3.96 m

Depth of well (TOC): 3.96 m

Well Elevation (TOC): 99.520 m

Ground Elevation: 99.572 m

APPENDIX B

Laboratory Reports

Analysis Report

CANTEST

REPORT ON: Analysis of Soil Samples

REPORTED TO: Hemmera Envirochem Inc.
250-1380 Burrard St
Vancouver, BC
V6Z 2H3

Att'n: Seth Kingsbury

CHAIN OF CUSTODY: 2090793, 2036847, 2036824
PROJECT NAME: FKPA Brownsville
PROJECT NUMBER: 405-003.03

NUMBER OF SAMPLES: 9

REPORT DATE: August 27, 2007

DATE SUBMITTED: August 16, 2007

GROUP NUMBER: 80817021

SAMPLE TYPE: Soil

NOTE: Results contained in this report refer only to the testing of samples as submitted. Other information is available on request.

TEST METHODS:

Volatile Hydrocarbons (VH) in Soil - analysis was performed using B.C. MOELP CSR-Analytical Method 1 "Volatile Hydrocarbons in Solids by GC/FID" approved August 12, 1999. The method involves methanol extraction and direct injection GC/FID analysis; components ranging from C6 to C10 are quantitated against m-xylene and 1,2,4-trimethylbenzene.

Volatile Petroleum Hydrocarbons (VPH) in Soil - results were obtained using B.C. MOELP CSR-Analytical Method Method 5 "Calculation of Volatile Petroleum Hydrocarbons in Solids or Water (VPH)" approved August 12, 1999. VPH is calculated by subtraction of specified MAH compounds from VH concentrations.

Volatile Organic Compounds in Soil - analysis was performed using procedures based on U.S. EPA Methods 624/8240/8260, involving methanol extraction, and direct injection/GCMS analysis.

Moisture in Soil - analysis was performed gravimetrically by heating a separate sample portion at 105 C and measuring the weight loss.

Extractable Petroleum Hydrocarbons in Water/Soil (LEPH/HEPH-GNS) - analysis was performed using a draft extraction-GC/FID procedure specified by the B.C. MOELP. Compounds eluting between n-decane (n-C10) and n-nonadecane (n-C19) are defined as Light Extractable Petroleum Hydrocarbons (LEPH). Compounds eluting between n-nonadecane and n-dotriacontane (n-C32) are defined as Heavy Extractable Petroleum Hydrocarbons (HEPH). The results can be compared to Generic Numerical Standard (GNS) criteria. The report states if results were corrected for specified PAH's, & if silica gel cleanup was used.

TEST RESULTS:

(See following pages)

CANTEST LTD.

Zhenyong Gao, M.Sc.
Coordinator, Trace Organics

4606 Canada Way, Burnaby, BC V5G 1K5
Tel: 604 734 7276 Fax: 604 731 2386

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: August 27, 2007

GROUP NUMBER: 80817021

CANTEST

Conventional Parameters in Soil

CLIENT SAMPLE IDENTIFICATION:	SAMPLE DATE	CANTEST ID	Moisture
MW07-7-5	Aug 15/07	708170056	25.2
MW07-7-9	Aug 15/07	708170057	29.0
MW-600	Aug 15/07	708170058	25.1
MW07-8-7	Aug 15/07	708170059	28.1
MW07-6-4	Aug 15/07	708170060	26.8
MW07-6-7	Aug 15/07	708170061	26.7
MW07-9-3	Aug 15/07	708170062	27.6
MW07-9-5	Aug 15/07	708170063	26.1
MW07-8-5	Aug 15/07	708170064	25.6
DETECTION LIMIT			0.1
UNITS			%

% = percent

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: August 27, 2007

GROUP NUMBER: 80817021

CANTEST

Monocyclic Volatile Hydrocarbons-Direct Injection- in Soil

CLIENT SAMPLE IDENTIFICATION:	MW07-7-5	MW07-7-9	MW-600	MW07-8-7	
DATE SAMPLED:	Aug 15/07	Aug 15/07	Aug 15/07	Aug 15/07	DETECTION LIMIT
CANTEST ID:	708170056	708170057	708170058	708170059	
Benzene	<	<	<	<	0.04
Ethylbenzene	<	<	<	<	0.5
Toluene	<	<	<	<	0.5
Xylenes	<	<	<	<	0.1
Styrene	<	<	<	<	0.1

Results expressed as micrograms per gram, on a dry weight basis. (μg/g)
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: August 27, 2007

GROUP NUMBER: 80817021

CANTEST

Monocyclic Volatile Hydrocarbons-Direct Injection- in Soil

CLIENT SAMPLE IDENTIFICATION:	MW07-6-4	MW07-6-7	MW07-9-3	MW07-9-5	
DATE SAMPLED:	Aug 15/07	Aug 15/07	Aug 15/07	Aug 15/07	DETECTION LIMIT
CANTEST ID:	708170060	708170061	708170062	708170063	
Benzene	<	<	<	<	0.04
Ethylbenzene	<	<	<	<	0.5
Toluene	<	<	<	<	0.5
Xylenes	<	<	<	<	0.1
Styrene	<	<	<	<	0.1

Results expressed as micrograms per gram, on a dry weight basis. (μg/g)
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: August 27, 2007

GROUP NUMBER: 80817021

CANTEST

Monocyclic Volatile Hydrocarbons-Direct Injection- in Soil

CLIENT SAMPLE IDENTIFICATION:	MW07-8-5	
DATE SAMPLED:	Aug 15/07	DETECTION LIMIT
CANTEST ID:	708170064	
Benzene	<	0.04
Ethylbenzene	<	0.5
Toluene	<	0.5
Xylenes	<	0.1
Styrene	<	0.1

Results expressed as micrograms per gram, on a dry weight basis. (μg/g)
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: August 27, 2007

GROUP NUMBER: 80817021

CANTEST

Monocyclic Aromatic Hydrocarbons-Methanol Extraction- in Soil

CLIENT SAMPLE IDENTIFICATION:	SAMPLE DATE	CANTEST ID	Volatile Hydrocarbons VHs6-10	VPHs
MW07-7-5	Aug 15/07	708170056	<	<
MW07-7-9	Aug 15/07	708170057	<	<
MW-600	Aug 15/07	708170058	<	<
MW07-8-7	Aug 15/07	708170059	<	<
MW07-6-4	Aug 15/07	708170060	960	960
MW07-6-7	Aug 15/07	708170061	110	110
MW07-9-3	Aug 15/07	708170062	<	<
MW07-9-5	Aug 15/07	708170063	<	<
MW07-8-5	Aug 15/07	708170064	110	110
DETECTION LIMIT			100	100
UNITS			µg/g	µg/g

µg/g = micrograms per gram, on a dry weight basis.
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: August 27, 2007

GROUP NUMBER: 80817021

CANTEST

Extractable Petroleum Hydrocarbons - Silica-gel Cleanup in Soil

CLIENT SAMPLE IDENTIFICATION:	SAMPLE DATE	CANTEST ID	EPHs10-19 (Silica-gel treated)	EPHs19-32 (Silica-gel treated)
MW07-7-5	Aug 15/07	708170056	390	<
MW07-6-4	Aug 15/07	708170060	770	<
MW07-9-3	Aug 15/07	708170062	<	<
MW07-8-5	Aug 15/07	708170064	<	<
DETECTION LIMIT			250	250
UNITS			µg/g	µg/g

µg/g = micrograms per gram, on a dry weight basis.
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: August 27, 2007

GROUP NUMBER: 80817021

CANTEST

Batch Quality Control for Monocyclic Aromatic Hydrocarbons-Methanol Extraction- in Soil (QC# 97707)

Parameter	Blank (ug/g)	Blank Limits
Volatile Hydrocarbons VHs6-10	< 100	100

ug/g = micrograms per gram

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: August 27, 2007

GROUP NUMBER: 80817021

Instrument Quality Control for the HP Dir Inj GC-FID/MS 1119-1118 (QC# 191036)

QC Type: Detection Limit Check Standard

Parameter	% Recovery	Limits
Volatile Hydrocarbons VHs6-10	101	50 - 150

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: August 27, 2007

GROUP NUMBER: 80817021

CANTEST

Batch Quality Control for Monocyclic Volatile Hydrocarbons-Direct Injection- in Soil (QC# 97707)

Parameter	Blank (ug/g)	Blank Limits	Method Performance Check Spike (% Recovery)	Method Performance Check Spike Limits
Benzene	< 0.04	0.04	80	58 - 126
Ethylbenzene	< 0.5	0.5	81	66 - 116
Toluene	< 0.5	0.5	83	76 - 124

ug/g = micrograms per gram

Batch Quality Control Frequency Summary

MeOH Extr'n Prep BTEX/VPH Soil (Batch# 97707)

QC Type	No. Samples
Blank	1
Method Performance Check Spike	1

EPH (LEPH/HEPH)- Soil Prep (Batch# 97769)

QC Type	No. Samples
Blank	1
Cert Ref Material RTC CRM355	1
Duplicate	1
Method Performance Check Spike	1

MeOH Extr'n Prep BTEX/VPH Soil (Batch# 97707)

QC Type	No. Samples
Batch Size	48

EPH (LEPH/HEPH)- Soil Prep (Batch# 97769)

QC Type	No. Samples
Batch Size	18

AUTOFAX
COVER SHEET

CANTEST®
A Member of the CANAM Group
http://www.testing-labs.com

CanTest Ltd.

Professional
Analytical
Services

4606 Canada Way
Burnaby, BC
V5G 1K5

Fax: 604 731 2386

Tel: 604 734 7276

1 800 665 8566

Date: September 22, 2008
To: Hemmera Envirochem Inc.
Att'n: Seth Kingsbury
From: LINKS Automatic Fax
Subject: Analytical results for Group# 90917051

MESSAGE:

The analytical results on these pages are being sent to you via the CANTEST Laboratory Information News and Knowledge System (LINKS) "AutoFax" service. This transmission includes data submitted under the following project information:

CANTEST Group#	**90917051**
Project Name:	**Brownsville**
Project Number:	**405-003.04**
Submission Date:	**September 17, 2008**
Matrix:	**Soil**

A signed final report and invoice will be sent within two weeks.

Thank you for considering CANTEST for your analytical needs. Please feel free to contact a Technical Service Representative at (604) 734-7276 (1-800-665-8566) should you have any questions about the LINKS "AutoFax" or any other CANTEST services.

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: September 22, 2008

GROUP NUMBER: 90917051

Conventional Parameters in Soil

CLIENT SAMPLE IDENTIFICATION:	SAMPLE DATE	CANTEST ID	Moisture
BH08-12.3	Sep 16/08	809170309	28.9
BH08-12.4	Sep 16/08	809170320	25.7
BH08-12.5	Sep 16/08	809170321	22.9
MW08-13.2	Sep 16/08	809170323	15.6
MW08-13.4	Sep 16/08	809170324	27.8
MW08-13.5	Sep 16/08	809170325	26.4
MW08-10.3	Sep 16/08	809170328	25.0
MW08-10.4	Sep 16/08	809170329	23.5
MW08-11.2	Sep 16/08	809170330	21.3
MW08-11.4	Sep 16/08	809170331	25.1
DETECTION LIMIT			0.1
UNITS			%

% = percent

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: September 22, 2008

GROUP NUMBER: 90917051

Monocyclic Volatile Hydrocarbons-Direct Injection- in Soil

CLIENT SAMPLE IDENTIFICATION:	BH08-12.3	BH08-12.4	BH08-12.5	MW08-13.2	
DATE SAMPLED:	Sep 16/08	Sep 16/08	Sep 16/08	Sep 16/08	DETECTION LIMIT
CANTEST ID:	809170309	809170320	809170321	809170323	
Benzene	<	<	<	<	0.04
Ethylbenzene	<	<	<	<	0.5
Toluene	<	<	<	<	0.5
Xylenes	<	<	<	<	0.1
Styrene	<	<	<	<	0.1

Results expressed as micrograms per gram, on a dry weight basis. (µg/g)
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: September 22, 2008

GROUP NUMBER: 90917051

Monocyclic Volatile Hydrocarbons-Direct Injection- in Soil

CLIENT SAMPLE IDENTIFICATION:	MW08-13.4	MW08-13.5	MW08-10.3	MW08-10.4	
DATE SAMPLED:	Sep 16/08	Sep 16/08	Sep 16/08	Sep 16/08	DETECTION LIMIT
CANTEST ID:	809170324	809170325	809170328	809170329	
Benzene	<	<	<	<	0.04
Ethylbenzene	<	<	<	<	0.5
Toluene	<	<	<	<	0.5
Xylenes	<	<	<	<	0.1
Styrene	<	<	<	<	0.1

Results expressed as micrograms per gram, on a dry weight basis. (µg/g)
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: September 22, 2008

GROUP NUMBER: 90917051

Monocyclic Volatile Hydrocarbons-Direct Injection- in Soil

CLIENT SAMPLE IDENTIFICATION:	MW08-11.2	MW08-11.4	
DATE SAMPLED:	Sep 16/08	Sep 16/08	DETECTION LIMIT
CANTEST ID:	809170330	809170331	
Benzene	<	<	0.04
Ethylbenzene	<	<	0.5
Toluene	<	<	0.5
Xylenes	<	<	0.1
Styrene	<	<	0.1

Results expressed as micrograms per gram, on a dry weight basis. (µg/g)
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: September 22, 2008

GROUP NUMBER: 90917051

Monocyclic Aromatic Hydrocarbons-Methanol Extraction- in Soil

CLIENT SAMPLE IDENTIFICATION:	SAMPLE DATE	CANTEST ID	Volatile Hydrocarbons VHs6-10	VPHs
BH08-12.3	Sep 16/08	809170309	1200	1200
BH08-12.4	Sep 16/08	809170320	170	170
BH08-12.5	Sep 16/08	809170321	3000	3000
MW08-13.2	Sep 16/08	809170323	<	<
MW08-13.4	Sep 16/08	809170324	<	<
MW08-13.5	Sep 16/08	809170325	<	<
MW08-10.3	Sep 16/08	809170328	<	<
MW08-10.4	Sep 16/08	809170329	<	<
MW08-11.2	Sep 16/08	809170330	<	<
MW08-11.4	Sep 16/08	809170331	<	<
DETECTION LIMIT			100	100
UNITS			µg/g	µg/g

µg/g = micrograms per gram, on a dry weight basis.
< = Less than detection limit

Analysis Report

CANTEST LTD.

Professional
Analytical
Services

4606 Canada Way
Burnaby, B.C.
V5G 1K5

FAX: 604 731 2386

TEL: 604 734 7276

1 800 665 8566

REPORT ON: Analysis of Soil Samples

REPORTED TO: Hemmera Envirochem Inc.
250-1380 Burrard St
Vancouver, BC
V6Z 2H3

Att'n: Seth Kingsbury

CHAIN OF CUSTODY: 2042054, 2042053
PROJECT NAME: Brownsville
PROJECT NUMBER: 405-003.04
P.O. NUMBER: 4629

NUMBER OF SAMPLES: 10

REPORT DATE: September 22, 2008

DATE SUBMITTED: September 17, 2008

GROUP NUMBER: 90917051

SAMPLE TYPE: Soil

NOTE: Results contained in this report refer only to the testing of samples as submitted. Other information is available on request.

TEST METHODS:

Volatile Hydrocarbons (VH) in Soil - analysis was performed using B.C. MOELP CSR-Analytical Method 1 "Volatile Hydrocarbons in Solids by GC/FID" approved August 12, 1999. The method involves methanol extraction and direct injection GC/FID analysis; components ranging from C6 to C10 are quantitated against m-xylene and 1,2,4-trimethylbenzene.

Volatile Petroleum Hydrocarbons (VPH) in Soil - results were obtained using B.C. MOELP CSR-Analytical Method Method 5 "Calculation of Volatile Petroleum Hydrocarbons in Solids or Water (VPH)" approved August 12, 1999. VPH is calculated by subtraction of specified MAH compounds from VH concentrations.

Volatile Organic Compounds in Soil - analysis was performed using procedures based on U.S. EPA Methods 624/8240/8260, involving methanol extraction, and direct injection/GCMS analysis.

Moisture in Soil - analysis was performed gravimetrically by heating a separate sample portion at 105 C and measuring the weight loss.

TEST RESULTS:

(See following pages)

CANTEST LTD.

Zhenyong Gao, M.Sc.
Coordinator, Trace Organics

Analysis Report

CANTEST

REPORT ON: Analysis of Water Samples

REPORTED TO: Hemmera Envirochem Inc.
250-1380 Burrard St
Vancouver, BC
V6Z 2H3

Att'n: Seth Kingsbury

CHAIN OF CUSTODY: 2036823
PROJECT NAME: FRPA Brownsville
PROJECT NUMBER: 405-003.03

NUMBER OF SAMPLES: 6

REPORT DATE: August 27, 2007

DATE SUBMITTED: August 16, 2007

GROUP NUMBER: 80817037

SAMPLE TYPE: Water

NOTE: Results contained in this report refer only to the testing of samples as submitted. Other information is available on request.

TEST METHODS:

Volatile Organic Compounds in Water and Soil - analysis was performed using procedures based on U.S. EPA Methods 624/8240/8260, involving sparging with a Purge and Trap apparatus and analysis using GC/MS.

Volatile Hydrocarbons (VH) and Volatile Petroleum Hydrocarbons (VPH) in Water - analysis was performed using B.C. MOELP CSR-Analytical Method 2 "Volatile Hydrocarbons in Water by GC/FID" and CSR-Analytical Method 5 "Calculation of Volatile Petroleum Hydrocarbons in Solids or Water (VPH)" approved August 12, 1999. The method involves sparging/collection using a Purge & Trap apparatus with GC/MS analysis; VH components ranging from C6 to C10 are quantified against m-xylene and 1,2,4-trimethylbenzene. VPH is calculated by subtraction of specified MAH compounds from VH concentrations.

Extractable Petroleum Hydrocarbons and Light and Heavy Extractable Petroleum Hydrocarbons in Water - analysis was performed using B.C. MOELP CSR-Analytical Method 4 "Extractable Petroleum Hydrocarbons in Water by GC/FID" and CSR-Analytical Method 6 "Calculation of Light and Heavy Extractable Petroleum Hydrocarbons in Solids or Water (LEPH & HEPH)". The method involves DCM extraction and GC/FID analysis. EPH components ranging from C10 to C19 and C19 to C32 are quantified against eicosane (n-C20). LEPH & HEPH are calculated by subtraction of specified PAH's.

TEST RESULTS:

(See following pages)

CANTEST LTD.

Zhenyong Gao, M.Sc.
Coordinator, Trace Organics

4606 Canada Way, Burnaby, BC V5G 1K5
Tel: 604 734 7276 Fax: 604 731 2386

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: August 27, 2007

GROUP NUMBER: 80817037

CANTEST

Monocyclic Aromatic Hydrocarbons in Water

CLIENT SAMPLE IDENTIFICATION:	MW07-6	MW07-7	MW07-8	MW07-9	
DATE SAMPLED:	Aug 16/07	Aug 16/07	Aug 16/07	Aug 16/07	
CANTEST ID:	708170107	708170111	708170115	708170118	DETECTION LIMIT
ANALYSIS DATE:	Aug 17/07	Aug 17/07	Aug 17/07	Aug 17/07	
Benzene	< 0.5	< 1	<	<	0.1
Ethylbenzene	1.2	< 1	0.4	<	0.1
Toluene	< 0.5	1.7	0.3	<	0.1
Xylenes	4.4	2.9	2.0	<	0.1
Volatile Hydrocarbons VHw6-10	3600	1700	590	<	100
VPHw	3600	1700	590	<	100
Styrene	< 0.5	< 1	<	<	0.1
Surrogate Recovery					
Toluene-d8	115	108	95	95	-
Bromofluorobenzene	90	87	93	82	-

Results expressed as micrograms per liter (μg/L)
Surrogate recoveries expressed as percent (%)
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: August 27, 2007

GROUP NUMBER: 80817037

CANTEST

Monocyclic Aromatic Hydrocarbons in Water

CLIENT SAMPLE IDENTIFICATION:	MW1000	
DATE SAMPLED:	Aug 16/07	
CANTEST ID:	708170139	DETECTION LIMIT
ANALYSIS DATE:	Aug 17/07	
Benzene	1.9	0.1
Ethylbenzene	0.8	0.1
Toluene	1.8	0.1
Xylenes	3.8	0.1
Volatile Hydrocarbons VHw6-10	1400	100
VPHw	1400	100
Styrene	<	0.1
Surrogate Recovery		
Toluene-d8	103	-
Bromofluorobenzene	84	-

Results expressed as micrograms per liter (μg/L)
Surrogate recoveries expressed as percent (%)
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: August 27, 2007

GROUP NUMBER: 80817037

CANTEST

Extractable Petroleum Hydrocarbons (EPH) in Water

CLIENT SAMPLE IDENTIFICATION:	SAMPLE DATE	CANTEST ID	EPHw10-19	EPHw19-32
MW07-6	Aug 16/07	708170107	2300	<
MW07-7	Aug 16/07	708170111	1700	300
MW07-8	Aug 16/07	708170115	1400	<
MW07-9	Aug 16/07	708170118	<	<
MW900	Aug 16/07	708170120	1900	<
DETECTION LIMIT			250	250
UNITS			µg/L	µg/L

µg/L = micrograms per liter
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: August 27, 2007

GROUP NUMBER: 80817037

Batch Quality Control for Extractable Petroleum Hydrocarbons (EPH) in Water (QC# 97840)

Parameter	Blank (ug/L)	Blank Limits
EPHw10-19	< 250	250
EPHw19-32	< 250	250

ug/L = micrograms per liter

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: August 27, 2007

GROUP NUMBER: 80817037

CANTEST

Instrument Quality Control for the HP5890GC +ECD(PCB) or FID(EPH) (QC# 191322)

QC Type: Detection Limit Check Standard

Parameter	% Recovery	Limits
EPHw10-19	64	50 - 150
EPHw19-32	80	50 - 150

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: August 27, 2007

GROUP NUMBER: 80817037

CANTEST

Batch Quality Control Frequency Summary

TEH/EPH Water Preparation (Batch# 97840)

QC Type	No. Samples
Blank	1
Method Performance Check Spike	1

Volatiles Analysis (Batch# 97760)

QC Type	No. Samples
Batch Size	21

TEH/EPH Water Preparation (Batch# 97840)

QC Type	No. Samples
Batch Size	17

AUTOFAX
COVER SHEET

CANTEST®
A Member of the CANAM Group

CanTest Ltd.

Professional
Analytical
Services

4606 Canada Way
Burnaby, BC
V5G 1K5

Fax: 604 731 2386

Tel: 604 734 7276

1 800 665 8566

Date: September 30, 2008
To: Hemmera Envirochem Inc.
Att'n: Seth Kingsbury
From: LINKS Automatic Fax
Subject: Analytical results for Group# 90923148

MESSAGE:

The analytical results on these pages are being sent to you via the CANTEST Laboratory Information News and Knowledge System (LINKS) "AutoFax" service. This transmission includes data submitted under the following project information:

CANTEST Group#	90923148
Project Name:	Brownsville
Project Number:	405-003.04
Submission Date:	September 23, 2008
Matrix:	Water

A signed final report and invoice will be sent within two weeks.

Thank you for considering CANTEST for your analytical needs. Please feel free to contact a Technical Service Representative at (604) 734-7276 (1-800-665-8566) should you have any questions about the LINKS "AutoFax" or any other CANTEST services.

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: September 30, 2008

GROUP NUMBER: 90923148

Monocyclic Aromatic Hydrocarbons in Water

CLIENT SAMPLE IDENTIFICATION:	MW08-2	MW08-6	MW08-7	MW08-8	
DATE SAMPLED:	Sep 22/08	Sep 22/08	Sep 22/08	Sep 22/08	
CANTEST ID:	809230761	809230762	809230763	809230764	DETECTION LIMIT
ANALYSIS DATE:	Sep 25/08	Sep 25/08	Sep 25/08	Sep 25/08	
Benzene	5.8	<	1.9	<	0.1
Ethylbenzene	1.1	<	0.6	<	0.1
Toluene	2.8	<	1.7	<	0.1
Xylenes	2.9	<	2.6	<	0.1
Volatile Hydrocarbons VHw6-10	1000	1100	600	<	100
VPHw	990	1100	590	<	100
Styrene	<	<	<	<	0.1
Surrogate Recovery					
Toluene-d8	103	102	102	97	-
Bromofluorobenzene	92	95	95	92	-

Results expressed as micrograms per liter (µg/L)
Surrogate recoveries expressed as percent (%)
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: September 30, 2008

GROUP NUMBER: 90923148

Monocyclic Aromatic Hydrocarbons in Water

CLIENT SAMPLE IDENTIFICATION:	MW08-9	MW08-10	MW08-11	MW08-12	DETECTION LIMIT
DATE SAMPLED:	Sep 22/08	Sep 22/08	Sep 22/08	Sep 22/08	
CANTEST ID:	809230765	809230766	809230767	809230768	
ANALYSIS DATE:	Sep 25/08	Sep 25/08	Sep 25/08	Sep 25/08	
Benzene	<	<	<	2.1	0.1
Ethylbenzene	<	<	<	0.6	0.1
Toluene	<	<	<	2.0	0.1
Xylenes	<	<	<	2.7	0.1
Volatile Hydrocarbons VHw6-10	<	<	<	790	100
VPHw	<	<	<	780	100
Styrene	<	<	<	<	0.1
Surrogate Recovery					
Toluene-d8	95	94	94	102	-
Bromofluorobenzene	96	97	95	95	-

Results expressed as micrograms per liter (µg/L)
Surrogate recoveries expressed as percent (%)
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: September 30, 2008

GROUP NUMBER: 90923148

Monocyclic Aromatic Hydrocarbons in Water

CLIENT SAMPLE IDENTIFICATION:	MW08-13	
DATE SAMPLED:	Sep 22/08	
CANTEST ID:	809230769	DETECTION LIMIT
ANALYSIS DATE:	Sep 25/08	
Benzene	<	0.1
Ethylbenzene	<	0.1
Toluene	<	0.1
Xylenes	<	0.1
Volatile Hydrocarbons VHw6-10	<	100
VPHw	<	100
Styrene	<	0.1
Surrogate Recovery		
Toluene-d8	94	-
Bromofluorobenzene	92	-

Results expressed as micrograms per liter (µg/L)
Surrogate recoveries expressed as percent (%)
< = Less than detection limit

REPORTED TO: Hemmera Envirochem Inc.

REPORT DATE: September 30, 2008

GROUP NUMBER: 90923148

Extractable Petroleum Hydrocarbons - Silica-gel Cleanup in Water

CLIENT SAMPLE IDENTIFICATION:	SAMPLE DATE	CANTEST ID	EPHw10-19 (Silica-gel treated)	EPHw19-32 (Silica-gel treated)
MW08-2	Sep 22/08	809230761	870	<
MW08-6	Sep 22/08	809230762	700	<
MW08-7	Sep 22/08	809230763	1700	<
MW08-8	Sep 22/08	809230764	<	<
MW08-9	Sep 22/08	809230765	<	<
MW08-10	Sep 22/08	809230766	<	<
MW08-11	Sep 22/08	809230767	<	<
MW08-12	Sep 22/08	809230768	1900	<
MW08-13	Sep 22/08	809230769	<	<
DETECTION LIMIT			250	250
UNITS			µg/L	µg/L

µg/L = micrograms per liter
< = Less than detection limit

Analysis Report

CANTEST LTD.

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Services

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Burnaby, B.C.
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TEL: 604 734 7276

1 800 665 8566

REPORT ON: Analysis of Water Samples

REPORTED TO: Hemmera Envirochem Inc.
250-1380 Burrard St
Vancouver, BC
V6Z 2H3

Att'n: Seth Kingsbury

CHAIN OF CUSTODY: 2124930
PROJECT NAME: Brownsville
PROJECT NUMBER: 405-003.04
P.O. NUMBER: 4629

NUMBER OF SAMPLES: 9

REPORT DATE: September 30, 2008

DATE SUBMITTED: September 23, 2008

GROUP NUMBER: 90923148

SAMPLE TYPE: Water

NOTE: Results contained in this report refer only to the testing of samples as submitted. Other information is available on request.

TEST METHODS:

Volatile Organic Compounds in Water and Soil - analysis was performed using procedures based on U.S. EPA Methods 624/8240/8260, involving sparging with a Purge and Trap apparatus and analysis using GC/MS.

Volatile Hydrocarbons (VH) and Volatile Petroleum Hydrocarbons (VPH) in Water - analysis was performed using B.C. MOELP CSR-Analytical Method 2 "Volatile Hydrocarbons in Water by GC/FID" and CSR-Analytical Method 5 "Calculation of Volatile Petroleum Hydrocarbons in Solids or Water (VPH)" approved August 12, 1999. The method involves sparging/collection using a Purge & Trap apparatus with GC/MS analysis; VH components ranging from C6 to C10 are quantified against m-xylene and 1,2,4-trimethylbenzene. VPH is calculated by subtraction of specified MAH compounds from VH concentrations.

Extractable Petroleum Hydrocarbons in Water/Soil (LEPH/HEPH-GNS) - analysis was performed using a draft extraction-GC/FID procedure specified by the B.C. MOELP. Compounds eluting between n-decane (n-C10) and n-nonadecane (n-C19) are defined as Light Extractable Petroleum Hydrocarbons (LEPH). Compounds eluting between n-nonadecane and n-dotriacontane (n-C32) are defined as Heavy Extractable Petroleum Hydrocarbons (HEPH). The results can be compared to Generic Numerical Standard (GNS) criteria. The report states if results were corrected for specified PAH's, & if silica gel cleanup was used.

COMMENTS:

Samples received at 14.4 degrees Celsius.

TEST RESULTS:

(See following pages)

CANTEST LTD.

Zhenyong Gao, M.Sc.
Coordinator, Trace Organics