

October 11, 2018
File: 123221079

Attention: Ms. Lori Beaulieu - Project Manager, Capital Projects
BC Transit
520 Gorge Road East
PO Box 9861
Victoria BC V8W 9T5

Dear Ms. Beaulieu,

Reference: 2401 Burnside Road West in Victoria, BC ITQ16.35-0011

Stantec Consulting Ltd. (Stantec) was commissioned by BC Transit Corporation (BC Transit) to conduct a Phase II Environmental Site Assessment (Phase II ESA), in support of the land purchase agreement of the property at 2401 Burnside Road West in Victoria, BC, herein referred to as the "Site." Upon review of the results of the Phase II ESA, Stantec recommended subsequent soil sampling to delineated identified metals contamination in soil in one location on the Site, the subject of this letter report.

This letter report was completed to support the request for "No Further Investigation Required" by the Ministry of Environment and Climate Change Strategy (MOECCS) with regards to a submission of a Site Profile for the Site, as part of a development permit application.

1 BACKGROUND

Stantec completed a Phase II ESA (Phase II Environmental Site Assessment – 2401 Burnside Road West, Victoria BC, May 23, 2018) in general accordance with our proposal dated January 4, 2018, to meet the requirements specified by BC Transit in the Invitation to Quote (ITQ) – Professional Services ITQ 16.35-0011 (dated December 18, 2017).

The objective of the Phase II ESA was to assess areas of potential environmental concern (APECs) identified during a Phase I ESA, completed by WSP in 2017, for the presence of potential contaminants of concern (PCOCs).

Based on the results of the Phase II ESA, Stantec offered the following conclusions for the Site:

- The reported concentration of arsenic in one soil sample was greater than the standard protective of groundwater. Soil samples collected above and below the contamination identified had concentrations of arsenic less than the standard, indicating that it is vertically delineated.
- The reported concentration of total chromium in one soil sample was greater than the standard for hexavalent chromium. Speciation of chromium in the sample indicated that the individual concentrations of trivalent and hexavalent chromium were less than the applicable standards.

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- The reported concentrations of cobalt and nickel in one soil sample were greater than the standards protective of groundwater. Soil sampled from greater depth had concentrations of cobalt and nickel that were less than the standards, indicating that the contamination is vertically delineated.
- Reported concentrations of all other PCOCs in soil samples were below the applicable standards, or less than the laboratory's reportable detection limits (RDLs).
- Reported concentrations of all PCOCs in groundwater samples were below the applicable standards, or less than laboratory RDLs.

Stantec reported that the arsenic soil contamination identified is most likely naturally occurring. Per the Phase II ESA, a statistical evaluation, following MOECCS Technical Guidance 2: Statistical Criteria for Characterizing a Volume of Contaminated Material (MOECCS, 2009) of the reported arsenic concentrations in all silty clay soil samples analyzed indicated that the overall quality of the soil, with respect to arsenic, met the applicable standards. No further investigation of arsenic in soil was recommended.

Stantec recommended additional investigation of soil for delineation purposes in the area of the shallow (0.3 to 0.6 m below ground surface [mbgs]) cobalt and nickel soil contamination identified during the Phase II ESA.

No further groundwater investigation was recommended.

Drawing 1, indicating the Site location previous and current sample locations is provided in **Appendix A**.

2 APPROPRIATE REGULATORY STANDARDS

The regulatory framework (in particular, the BC *Contaminated Sites Regulation* (CSR) standards that apply to the Site) is summarized below.

According to the Town of View Royal zoning by-laws, the Site is zoned as "Parks and Recreation (P-3)". Stantec has been informed that, if BC Transit purchases the Site, it will be rezoned to be used as a vehicle repair operation, an industrial activity. Therefore, for this investigation, the Industrial Land Use (IL) standards were applied.

The following CSR standards have been determined to be applicable at the Site:

- Schedule 3.1 Part 1 – matrix numerical soil standards for IL
- Schedule 3.1 Part 2 – generic numerical soil standards for IL
- Schedule 3.2 – generic numerical water standards for the protection of freshwater aquatic life and drinking water

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3 SCOPE OF WORK

3.1 SHALLOW SOIL DELINEATION SAMPLING

On September 11, 2018 Stantec returned to the Site to collect shallow soil samples at three step-out locations surrounding the sampling point (MW18-01) where cobalt and nickel contamination had been found. Stantec's delineation scope of work included the following:

- Completing a health and safety plan for the scope of work
- Mobilizing one Stantec field representative to the Site
- Advancing three hand auger boreholes to a maximum depth of 0.7 mbgs, or as practicable based on soil conditions
- Collecting a total of four soil samples (including one field duplicate for quality assurance purposes)
- Collecting site photographs to document current site conditions

4 METHODOLOGY

Sampling was performed using generally-accepted environmental practices in accordance with the BC MOECCS Field Sampling Manual, CSR protocols, procedures, and guidelines, and Stantec's standard field procedures.

Per MOECCS *Technical Guidance 1: Site Characterization and Confirmation Testing* Stantec collected three step-out soil samples, at spacing no more than seven m from the original sample (MW18-01) at roughly the same depth (0.3 – 0.6 mbgs). Soil was characterized based on soil type, grain size, colour, moisture. Soil samples were placed in laboratory-supplied jars and submitted for analysis of the previously-identified contaminants of concern (cobalt and nickel).

Disposable nitrile gloves were used and replaced after the collection of each sample to prevent cross-contamination. One field duplicate soil sample was submitted for quality assurance and quality control (QA/QC) purposes.

5 FIELD OBSERVATIONS

During the field sampling event, there was no observable contamination (i.e., sheen, staining, odour, etc.) at the three step-out locations.

The soils at the step-out locations were topsoil on the upper 0.05 m underlain by silt, with trace sand and gravel to a maximum investigated depth of 0.55 mbgs.

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6 SEDIMENT AND SURFACE WATER ANALYTICAL RESULTS

A total of four delineation soil samples (including one field duplicate) were collected and submitted to ALS Environmental (ALS) in Victoria, BC for analysis of cobalt and nickel.

Laboratory analytical results indicated that concentrations of the contaminants of concern were less than the applicable guidelines.

Locations of the samples collected from the excavation limits are indicated on Drawing 1 of **Appendix A**. Analytical results for the soil samples are provided in Table 1 of Appendix B. Laboratory certificates for samples analysed during this program are included in **Appendix C**.

7 QUALITY ASSURANCE AND QUALITY CONTROL

7.1 LABORATORY QA/QC

The internal QA/QC program followed by ALS includes duplicate samples, matrix spikes, spiked blanks, method blanks, sample temperature, and sample holding times.

Results of quality control calculations (i.e., matrix spike, spiked blank, method blank and relative percent difference (RPD) calculations) for the laboratory QA/QC samples are presented in the laboratory analytical reports provided in **Appendix C**.

7.2 FIELD QA/QC

During delineation sampling activities one field duplicate sample was collected and analyzed. The RPD between the original sample and the duplicate was calculated as 3% for both the cobalt and nickel results. The RPD value was well below the acceptable limit of 60%.

8 CONCLUSIONS

Stantec returned to the Site on September 11, 2018 to collect delineation soil samples from step-out locations less than seven m from MW18-01, the location of previously-identified soil contamination. There was no observable contamination (sheen, staining, odour, etc.) at the Site. Reported analytical results for the delineation soil samples indicated that contaminant concentrations were less than the applicable CSR standards.

The previously-identified soil contamination at MW18-01 at a depth of 0.3 – 0.6 mbgs is considered to be an isolated issue, and not representative of a larger or site-wide condition.

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9 RECOMMENDATIONS

Based on the field observations and analytical results obtained to date, Stantec does not recommend any further investigation or remediation at this time.

If BC Transit excavates any soil from the area of MW18-01, Stantec recommends that at least 10 cubic metres are disposed of at an approved facility, per TG1.

10 LIMITATIONS

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential liabilities associated with the identified property.

This report provides an evaluation of selected environmental conditions associated with the identified portion of the property that was assessed at the time the work was conducted and is based on information obtained by and/or provided to Stantec at that time. There are no assurances regarding the accuracy and completeness of this information. All information received from the client or third parties in the preparation of this report has been assumed by Stantec to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

The opinions in this report can only be relied upon as they relate to the condition of the portion of the identified property that was assessed at the time the work was conducted. Activities at the property subsequent to Stantec's assessment may have significantly altered the property's condition. Stantec cannot comment on other areas of the property that were not assessed.

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report and are based solely on the scope of work described in the report, the limited data available and the results of the work. They are not a certification of the property's environmental condition. This report should not be construed as legal advice.

This report has been prepared for the exclusive use of the client identified herein and any use by any third party is prohibited. Stantec assumes no responsibility for losses, damages, liabilities or claims, howsoever arising, from third party use of this report.

The locations of any utilities, buildings and structures, and property boundaries illustrated in or described within this report, if any, including pole lines, conduits, water mains, sewers and other surface or sub-surface utilities and structures are not guaranteed. Before starting work, the exact location of all such utilities and structures should be confirmed and Stantec assumes no liability for damage to them.

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The conclusions are based on the site conditions encountered by Stantec at the time the work was performed at the specific testing and/or sampling locations, and conditions may vary among sampling locations. Factors such as areas of potential concern identified in previous studies, site conditions (e.g., utilities) and cost may have constrained the sampling locations used in this assessment. In addition, analysis has been carried out for only a limited number of chemical parameters, and it should not be inferred that other chemical species are not present. Due to the nature of the investigation and the limited data available, Stantec does not warrant against undiscovered environmental liabilities nor that the sampling results are indicative of the condition of the entire site. As the purpose of this report is to identify site conditions which may pose an environmental risk; the identification of non-environmental risks to structures or people on the site is beyond the scope of this assessment.

Should additional information become available which differs significantly from our understanding of conditions presented in this report, Stantec specifically disclaims any responsibility to update the conclusions in this report.

This report was prepared by Matthew Deane, P.Ag. and reviewed by Bob Beck, P.Geo., CSAP.

Regards,

Stantec Consulting Ltd.

DRAFT

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Attachment: Appendix A – Drawings
Appendix B – Analytical Tables
Appendix C – Laboratory Certificates

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APPENDIX A DRAWINGS



MW18-03			
PARAMETER	DEPTH (mbgs)	STANDARD (mg/kg)	CONCENTRATION (mg/kg)
ARSENIC	3.4 - 3.7	10 ^{AC}	6.60
	4.1 - 4.4		12.7
	4.6 - 4.9		6.71






BH18-05			
PARAMETER	DEPTH (mbgs)	STANDARD (mg/kg)	CONCENTRATION (mg/kg)
COBALT	0.45 - 0.55	25 ^{AC}	12.20
NICKEL	0.45 - 0.55	70 ^C	25.9

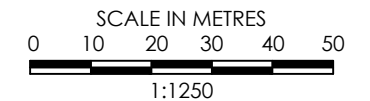
BH18-07			
PARAMETER	DEPTH (mbgs)	STANDARD (mg/kg)	CONCENTRATION (mg/kg)
COBALT	0.30 - 0.35	25 ^{AC}	14.00
NICKEL	0.30 - 0.35	70 ^C	34.7

MW18-01			
PARAMETER	DEPTH (mbgs)	STANDARD (mg/kg)	CONCENTRATION (mg/kg)
COBALT	0.3 - 0.6	25 ^{AC}	33.10
	1.0 - 1.3		15.7
NICKEL	0.3 - 0.6	70 ^C	87.2
	1.0 - 1.3		31

BH18-06			
PARAMETER	DEPTH (mbgs)	STANDARD (mg/kg)	CONCENTRATION (mg/kg)
COBALT	0.30 - 0.35	25 ^{AC}	13.90
NICKEL	0.30 - 0.35	70 ^C	36.9

LEGEND

- - - - SITE PROPERTY LINE
- - - - LOTLINE
- WATERCOURSE
- - - - PROPOSED SITE LAYOUT
- - - - CANADIAN NATIONAL RAILWAY RIGHT-OF-WAY
- PAVED ROAD
- - - - GRAVEL ROAD
- EXISTING BUILDING
-  MONITORING WELL LOCATION
-  BOREHOLE LOCATION
-  SOIL SAMPLE LOCATION
-  SOIL ANALYTICAL RESULTS LESS THAN APPLICABLE STANDARDS
-  SOIL ANALYTICAL RESULTS GREATER THAN APPLICABLE STANDARDS



Sources

Project Information

Project No.: 123221079
 Scale: 1:1250
 Date: 2018-OCT-10
 Drawn by: G. HUYNH/DM
 Checked by: M. DEANE

Client/Project

BC TRANSIT COMPANY
 VIEW ROYAL HANDYDART
 SITE INVESTIGATION AND REMEDIATION

Project Location

2401 BURNSIDE ROAD WEST
 VICTORIA, BC

TITLE

SOIL DELINEATION

Dwg No.

1



DISCLAIMER: The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any error or omissions shall be reported to Stantec without delay. The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

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 2018/10/10 10:18 AM By: Huynh, Gordon

APPENDIX B

ANALYTICAL TABLES

Table 1 - Summary of Soil Analytical Results
Soil Delineation
2401 Burnside Rd West, Victoria BC
BC Transit

Sample Location	Sample Date	Sample ID	Sample Depth	Laboratory	Laboratory Work Order	Laboratory Sample ID	Sample Type	Units	CSR-Schedule 3.1.1	CSR-Schedule 3.1.2	CSR-Schedule 3.1.3	Protocol 4 Background Concentrations	MW18-01		BH18-05		BH18-06	BH18-07	RPD %
													4-Apr-18 SO_123221079- _20180404- MW18-01-SA1 0.3 - 0.6 m ALS L2076777 L2076777-1	4-Apr-18 SO_123221079- _20180404- MW18-01-SA2 1.0 - 1.3 m ALS L2076777 L2076777-2	11-Sep-18 SO-123221079- 20180911-BH18- 05-SA1 0.45 - 0.50 ALS L2162715 L2162715 -1	11-Sep-18 SO-123221079- 20180911- DUP01 0.45 - 0.50 ALS L2162715 L2162715 -4 Field Duplicate	11-Sep-18 SO-123221079- 20180911-BH18- 06-SA1 0.30 - 0.35 ALS L2162715 L2162715 -2	11-Sep-18 SO-123221079- 20180911-BH18- 07-SA1 0.30 - 0.35 ALS L2162715 L2162715 -3	
Metals																			
Cobalt	mg/kg								25 ^{AC} 200 ^B 2,000 ^D	n/v	n/v	30	33.1 ^{AC}	15.7	12.2	12.9	3%	13.9	14
Nickel	mg/kg								90-9,500 ^{PH17} 250 ^B 70-500 ^{PH16} 80,000 ^D	n/v	n/v	50	87.2 ^C	31	25.9	27.5	3%	36.9	34.7

- Notes:**
- CSR-Schedule 3.1.1 CSR Schedule 3.1 - Part 1 - Matrix Numerical Soil Standards (Contaminated Sites Regulation (B.C. Reg. 375/96, April 1, 1997; includes amendments up to B.C. Reg. 196/2017, Oct. 31, 2017))
 - A Matrix Standard - Industrial Land Use (IL) - Groundwater flow to surface water used by aquatic life (freshwater)
 - B Matrix Standard - Industrial Land Use (IL) - Toxicity to soil invertebrates and plants (applicable to all sites)
 - C Matrix Standard - Industrial Land Use (IL) - Groundwater used for drinking water (applicable to all sites)
 - D Matrix Standard - Industrial Land Use (IL) - Intake of contaminated soil (applicable to all sites)
 - CSR-Schedule 3.1.2 CSR Schedule 3.1 - Part 2 - Generic Numerical Soil Standards to Protect Human Health (Contaminated Sites Regulation (B.C. Reg. 375/96, April 1, 1997; includes amendments up to B.C. Reg. 196/2017, Nov.1, 2017))
 - E Generic Human Health Standard - Industrial Land Use (IL)
 - CSR-Schedule 3.1.3 CSR Schedule 3.1 - Part 3 - Generic Numerical Soil Standards to Protect Ecological Health (Contaminated Sites Regulation (B.C. Reg. 375/96, April 1, 1997; includes amendments up to B.C. Reg. 196/2017, Nov.1, 2017))
 - F Generic Ecological Standard - Industrial Land Use (IL)
 - CSR - Protocol 4 Establishing Background Concentrations in Soil November 1, 2017
 - 6.5^A Concentration exceeds the indicated standard.
 - 15.2 Measured concentration did not exceed the indicated standard.
 - <0.50 Laboratory reporting limit was greater than the applicable standard.
 - <0.03 Analyte was not detected at a concentration greater than the laboratory reporting limit.
 - n/v No standard/guideline value.
 - Parameter not analyzed / not available.
 - PH16 Nickel standards vary with soil pH from 70-500 ug/g for groundwater used for drinking water for all land use types. For pH < 7.5 standard = 70 ug/g; For pH 7.5-<8.0 standard = 250 ug/g; For pH ≥ 8.0 standard = 500 ug/g. Consult CSR Schedule 3.1.1, Matrix 24.
 - PH17 Nickel standards vary with soil pH from 90-9,500 ug/g for groundwater flow to surface water used by aquatic life (freshwater) for all land use types. For pH < 5.0 standard = 90 ug/g; For pH 5.0 -<5.5 standard = 100 ug/g; For pH 5.5-<6.0 standard = 150 ug/g; For pH 6.0 -<6.5 standard = 200 ug/g; For pH 6.5-<7.0 standard = 300 ug/g; For pH 7.0->7.5 standard = 900 ug/g; For pH 7.5-<8.0 standard = 5,000 ug/g; For pH ≥ 8.0 standard = 9,500 ug/g. Consult CSR Schedule 3.1.1, Matrix 24.
 - RPD Relative Percent Difference
 - RDL reportable detection limit
 - nc Not Calculated - RPD values are not used to evaluate those compounds that are present at concentrations less than 5 times the reportable detection limit (RDL)

Field Duplicate acceptance limits are typically +/- 60% for high variability metals (Ag, Al, Ba, Hg, K, Mo, Na, Pb, Sn, Sr, Ti) and +/- 45% for all other metals in soil

APPENDIX C
LABORATORY CERTIFICATES



Stantec Consulting Ltd.
ATTN: Amy MacKay
400 - 655 Tyee Road
Victoria BC V9A 6X5

Date Received: 12-SEP-18
Report Date: 18-SEP-18 16:17 (MT)
Version: FINAL

Client Phone: 250-388-9161

Certificate of Analysis

Lab Work Order #: L2162715
Project P.O. #: NOT SUBMITTED
Job Reference: 123221079
C of C Numbers: 17-676118
Legal Site Desc:

Brent Mack, B.Sc.
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2162715-1	L2162715-2	L2162715-3	L2162715-4
		Description	Soil	Soil	Soil	Soil
		Sampled Date	11-SEP-18	11-SEP-18	11-SEP-18	11-SEP-18
		Sampled Time	09:45	09:25	09:55	09:50
		Client ID	SO-123221079-20180911-BH18-05-SA1	SO-123221079-20180911-BH18-06-SA1	SO-123221079-20180911-BH18-07-SA1	SO-123221079-20180911-DUP01
Grouping	Analyte					
SOIL						
Metals	Cobalt (Co) (mg/kg)		12.2	13.9	14.0	12.9
	Nickel (Ni) (mg/kg)		25.9	36.9	34.7	27.5

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
MET-200.2-CCMS-VA	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)

This method uses a heated strong acid digestion with HNO₃ and HCl and is intended to liberate metals that may be environmentally available. Silicate minerals are not solubilized. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. Analysis is by Collision/Reaction Cell ICPMS.

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

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

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

Chain of Custody Numbers:

17-676118

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

