



Hemmera Envirochem Inc.
18th Floor, 4730 Kingsway
Burnaby, BC V5H 0C6
T: 604.669.0424
F: 604.669.0430
hemmera.com

July 21, 2016
File: 1411-004.07

Ivanhoé Cambridge Inc.
Édifice Jacques-Parizeau
1001, rue du Square-Victoria, bureau C-500
Montréal, PQ H2Z 2B5

Attn: Sera Kontarini, Director, Environmental Compliance

Dear Ms. Kontarini,

Re: Performance Verification Plan for Certificate of Compliance at the Mayfair Shopping Center, 3147 Douglas Street, Victoria, BC

Hemmera Envirochem Inc (Hemmera) has prepared this Performance Verification Plan (PVP) in support of an application for a Certificate of Compliance for the Mayfair Shopping Center property located at 3147 Douglas Street, Victoria, BC (the "Site"). The PVP presents the principle risk management measures that apply at the Site so that risk-based standards are and continue to be met and the actions that must be taken so that these risk controls are implemented and maintained. This PVP was prepared in accordance with BC Ministry of Environment (MOE) *Procedure 12: Procedures for Preparing and Issuing Contaminated Site Legal Instruments* dated January 14, 2014 (BC MOE 2014a) and BC MOE Administrative Guidance on Contaminated Sites: *Performance Verification Plans, Contingency Plans, and Operations and Maintenance Plans, Version 1.0* dated February 2014 (BC MOE 2014b).

1.0 PRINCIPLE RISK ASSESSMENT MANAGEMENT CONTROLS

A screening level risk assessment (SLRA) was conducted for the Site in April 2016. The principle risk management measures on which the risk assessment were based, as presented in Schedule B of the Certificate of Compliance, are as follows:

- a) The petroleum hydrocarbon-impacted soil beneath the existing mall building must remain covered. Should the concrete above the impacted soil be removed in the future, exposed impacted soil must be excavated and disposed at an appropriate facility, or the concrete reinstated.
- b) Drinking water wells must not be installed on the Site.

2.0 DETERMINATION OF PROCEDURE 12 REMEDIATION TYPE

Based on the risk management measures for the Site (ie., the use of institutional controls to mitigate/eliminate risks at the Site and lack of imminent risks in the event that controls were either not implemented or were implemented but were rendered ineffective), the Remediation Type applicable at the Site is considered to be **Type 2**.

Under a Remediation Type 2 scenario, BC MOE (2014a; 2014b) indicates that a PVP is required, while an operations and maintenance plan may be required.

3.0 PERFORMANCE VERIFICATION PLAN

A PVP is required to maintain the principle risk management measures upon which the SLRA is based. This includes the maintenance of up-to-date records of performance verification actions and results for the Site being maintained by the responsible person (or their agents). If requested by the Director, the responsible person (or their agents) must provide these records to the BC MOE. As well, if requested by the Director, responsible person(s) must provide a signed statement on whether conditions set out in this Schedule B are being met.

3.1 REQUIRED RISK CONTROLS

- a) The petroleum hydrocarbon-impacted soil beneath the existing mall building must remain covered.
- b) Drinking water wells must not be installed on the Site.

3.2 REQUIRED ACTIONS TO IMPLEMENT THE REQUIRED RISK CONTROLS

- a) Annual inspections by mall staff to confirm that concrete above the petroleum-hydrocarbon impacted soil is still in place (recorded in a table and attached to the PVP).
- b) If concrete is removed, the exposed impacted soil should be removed or concrete reinstated.

3.3 SUMMARY OF RATIONALE FOR SELECTING REQUIRED PVP ELEMENT(S)

3.3.1 Petroleum hydrocarbon-impacted soil must not be exposed

Light and heavy extractable petroleum hydrocarbons (LEPH and HEPH, respectively) remain in soil at concentrations exceeding BC CSR Schedule 4 commercial land use standards. The SLRA concluded that the impacted soil beneath the mall building is unlikely to be exposed given that the current and proposed future Site use is a commercial shopping mall. Expansion or excavation in the vicinity of petroleum hydrocarbon-impacted soil is not planned or expected to occur due to the presence of shallow bedrock beneath the existing mall building. Although this condition would likely remain unchanged in the future, it is possible that the existing mall building could be demolished at some point in the future. Under this circumstance, exposed impacted soil should be excavated and disposed of at an appropriate facility or the concrete reinstated.

3.3.2 Drinking water wells must not be installed

Predicted groundwater concentrations (based on petroleum hydrocarbon impacted soil concentrations) exceed CSR Schedule 6 groundwater standards for drinking water use. Drinking water use applies in the area of the Site where petroleum hydrocarbon impacted soil is present. Drinking water wells are not currently present on-Site and unlikely to be installed at the Site in the future given that the current on-site buildings are connected to the municipal water system. Communication by the site owner to future users and operators that groundwater should not be used as a potable water supply is considered to be a suitable risk measure. Decommissioning of the existing monitoring wells would further mitigate this as a possibility.

3.4 ADDITIONAL CONSIDERATIONS

In addition to the LEPH and HEPH-impacted soil PVP elements that require a Risk Control, this PVP also considered ecological risk.

The SLRA concluded that the risks to terrestrial organisms from exposure to LEPH and HEPH in soil are also considered low given that (1) impacts are localized in soil; (2) the Site is currently and was historically (from circa 1960) a commercial shopping center located in a commercially-zoned area with limited vegetation; and (3) the impacts are located beneath the existing mall building, with no future plans for excavation or demolition in the vicinity of the soil impacts.

4.0 CLOSURE

We have appreciated the opportunity of working with you on this project and trust that this report is satisfactory to your requirements. Please feel free to contact the undersigned regarding any questions or further information that you may require.

Report prepared by:
Hemmera

**ORIGINAL SIGNED
AND STAMPED**

Lesley Knight, M.Sc., P.Eng.
Project Manager
604.669.0424 (179)
lknight@hemmera.com

**ORIGINAL SIGNED
AND STAMPED**

Diane Zorn, P.Eng., CSAP
Project Director
604.669.0424 (271)
dzorn@hemmera.com

This document represents an electronic version of the original hard copy document, sealed, signed and dated by Lesley Knight, M.Sc., P.Eng. and Diane Zorn, P.Eng., CSAP and retained on file. The content of the electronically transmitted document can be confirmed by referring to the original hard copy and filed. This document is provided in electronic format for convenience only. Hemmera Envirochem Inc. shall not be liable in any way for errors or omissions in any electronic version of its report document.

5.0 REFERENCES

BC MOE, 2008. BC Ministry of Environment Protocol 13: Screening Level Risk Assessment dated August 1, 2008;

BC MOE, 2014a. BC Ministry of Environment Procedure 12: Procedures for Preparing and Issuing Contaminated Site Legal Instruments dated January 14, 2014;

BC MOE, 2014b. BC MOE Administrative Guidance on Contaminated Sites: Performance Verification Plans, Contingency Plans, and Operations and Maintenance Plans, Version 1.0 and dated February 2014.

Hemmera, 2016. Stage 1 Preliminary Site Investigation Update, Stage 2 Preliminary Site Investigation, Detailed Site Investigation, Confirmation of Remediation, and Screening Level Risk Assessment, 3147 Douglas Street, Victoria, BC, June 2016.

Performance Verification CHECKLIST

Date:	
Site Address:	3147 Douglas Street, Victoria, BC
Assessor:	

PVP CONDITION 1: CONCRETE

Condition	Concrete above petroleum-hydrocarbon impacted soil is still in place (location indicated below, circled in black).
Observation	

