



January 31, 2017

Mr. Chris Luke
General Manager
Coal Island Ltd. and Carlton Contractors Ltd.
Suite 310, 10991 Shellbridge Way
Richmond, BC V6X 3C6

and

Mr. Karl Johannsen
Carlton Contractors Ltd.
5773 Byrne Road
Burnaby, BC V5J 3J1

Dear Mr. Luke and Mr. Johannsen:

**Re: Performance Verification Plan for Certificate of Compliance
5744, 5784 and 5820 Byrne Road, Burnaby, BC
Site ID: 3627
Project No. 12551**

1. BACKGROUND

Keystone Environmental Ltd. (Keystone Environmental) has prepared this Performance Verification Plan (PVP) in support of an application for a risk-based Certificate of Compliance (CofC) for the property located at the 5744, 5784 and 5820 Byrne Road, Burnaby, BC (herein referred to as the "Site").

The PVP presents the principal risk management measures (i.e., the Schedule B key risk management controls) that apply and must remain in place at the Site to ensure that the Site CofC remains valid. The PVP was prepared in accordance with BC Ministry of Environment (MOE) Administrative Guidance 14: Performance Verification Plans, Contingency Plans, and Operations and Maintenance Plans (MOE, 2015). The PVP was based on the findings of the following reports:

- Keystone Environmental report (2016b). *Report of Findings – Human Health and Ecological Risk Assessment, 5744, 5784 and 5820 Byrne Road, Burnaby, BC. Dated June 2016.*
- Keystone Environmental report (2016c). *Report of Findings – Addendum Human Health and Ecological Risk Assessment, 5744, 5784 and 5820 Byrne Road, Burnaby, BC. Dated August 2016.*
- Keystone Environmental report (2017b). *Report of Findings – Addendum Human Health and Ecological Risk Assessment, 5744, 5784 and 5820 Byrne Road, Burnaby, BC. Dated January 2017.*

2. PERFORMANCE VERIFICATION PLAN

2.1 Determination of Remediation Type

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

Under a Remediation Type 2 (Case 2) scenario, MOE (2015) indicates that a PVP is required and that an operations and maintenance plan may be required. A contingency plan is not required.

2.2 Required Risk Controls

The principal risk controls which must be maintained at the Site include the following items:

- Groundwater at the Site must not be used as drinking water.
- Deep-rooting trees (i.e., trees with rooting depths greater than 1 m) are not to be planted on-site in the vicinity of soil or groundwater contamination, unless contained within planter boxes.
- Sub-surficial (i.e., > 1 m depth) contaminated soils must remain covered by at least 1 m of uncontaminated soils compliant with applicable commercial land use standards.
- New buildings are not to be constructed in the area of soil vapour contamination as outlined in the metes and bounds (**See Attached Figure**):

Starting at the southwest corner of Lot 22, District lot 155b, Group 1, New Westminster District, Plan 27625:

Thence 2° 56' 57" for 144.710 metres;
to the point of commencement.

Thence 320° 12' 21" for 16.000 metres;

Thence 50° 12' 21" for 16.000 metres;

Thence 140° 12' 21" for 16.000 metres;

Thence 230° 12' 21" for 16.000 metres;

Returning to the point of commencement.

- Additionally, based on the assumptions of the Detailed Site Investigation (DSI) and Addendum to the DSI (Keystone Environmental, 2016a; 2017a), groundwater must not be in contact with the basement floor slab of Site buildings.

2.3 Required Actions to Implement the Required Risk Controls

The following actions are required to implement the risk controls:

- a) Mandatory notification provided to the owner/operator of the Site that no groundwater drinking water wells are to be installed on the Site.
- b) Mandatory notification provided to the owner/operator of the Site regarding deep-rooting tree planting restrictions.
- c) Mandatory notification to the owner/operator of the Site that sub-surficial soil contamination (i.e., >1 m depth) must remain covered by at least 1 metre of uncontaminated soil.
- d) Mandatory notification provided to the owner/operator of the Site regarding the constraints on new buildings (i.e., foundation must not be in contact with groundwater, no new buildings within the metes and bounds of the vapour contamination).

Records of these actions should be maintained by the Site owner and submitted to the MOE if requested. Other reporting requirements for all performance verification records include the following:

- The Director must be notified promptly by the person(s) responsible for the Site if performance verification actions indicate that any of the required risk controls are not being met. The following information must be submitted to the Director with the notification, or as soon as practicable thereafter:
 - The time period over which risk controls were not in place or implemented
 - The nature of the excursion(s)
 - The temporary or permanent corrective measures implemented or to be implemented
 - An implementation schedule
 - Supporting documentation

2.4 Summary Rationale

Groundwater contamination exceeding the CSR Schedule 6 drinking water standards is present at the Site. Drinking water at the Site is currently provided through municipal water lines. Groundwater at the Site is not expected to be used as drinking water in the future. A drinking water use preclusion on groundwater at the Site is needed to prevent potential human health risks associated with drinking water consumption of on-site groundwater.

In the future scenario, it was assumed that current vegetation would remain in place and no new vegetation would be planted; as such, in order to prevent future operable exposure pathways, deep rooting vegetation must not be planted in areas of soil or groundwater contamination unless planted in above ground planter boxes.

Additionally, the risk assessment assumed that the current depths of soil contamination would remain unchanged, hence, in order to prevent future operable exposure pathways, contaminated subsurface soils (i.e., >1 m depth) must remain covered with at least 1 m of uncontaminated soil.

Sub-surface naphthalene vapour concentrations measured at SV15-20 may result in indoor air concentrations in future buildings constructed in this area that pose unacceptable risks to human health. A condition that no new buildings be constructed in the area of soil vapour naphthalene contamination (specified in **Section 2.2** of this report) would mitigate such risks.

The risk assessment assumed that buildings will continue to have foundations that are not in contact with groundwater containing volatiles which may otherwise result in higher indoor air concentrations of volatiles than those evaluated in the risk assessment.

It is our opinion that the actions identified above are sufficient to ensure performance verification of the risk controls required for this Site.

3. GENERAL LIMITATIONS AND CONFIDENTIALITY

Findings presented in this report were based upon the Preliminary Site Investigation – Stage 1 (PSI 1) and Stage 2 (PSI 2), and Detailed Site Investigation (DSI) report, the HHERA report, and the addendum to the HHERA, completed for the properties located at 5744, 5784 and 5820 Byrne Road, Burnaby, BC, (Keystone Environmental, 2016a; 2016b; 2016c). This PVP was completed in a manner consistent with that level of care and skill normally exercised by other environmental professionals practicing under similar circumstances in the area at the time of the performance of the work.

This report has been prepared solely for the internal use of Coal Island Ltd. and Carlton Contractors Ltd. and the BC MOE, pursuant to the agreement between Keystone Environmental and Coal Island Ltd. and Carlton Contractors Ltd. This report must be read as a whole and sections thereof cannot be read out of such context. Keystone Environmental Ltd. accepts no responsibility, and denies any liability whatsoever, to parties other than Coal Island Ltd. and Carlton Contractors Ltd. and the BC MOE, who may obtain access to this report for any injury, loss or damage suffered by such parties arising out of, reliance upon, or decisions or actions based on this report, except to the extent those parties have obtained a prior written consent of Keystone Environmental to use and rely upon this report and the information contained herein. Any injury, loss or damages arising from improper use of this report shall be borne by the party making such use.

4. CLOSURE

The opinions, advice and recommendations expressed in this performance verification plan are made in accordance with generally accepted principles and practices as recognized by members of the applicable profession or discipline practising at the same time and in the same or similar locations.

If you have any questions, please do not hesitate to contact the signatories listed below.

Sincerely,

Keystone Environmental Ltd.

Original signed by

Adam J. Radlowski, M.Sc., R.P.Bio.
Senior Environmental Risk Assessor

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ATTACHMENT:

- Figure

REFERENCES

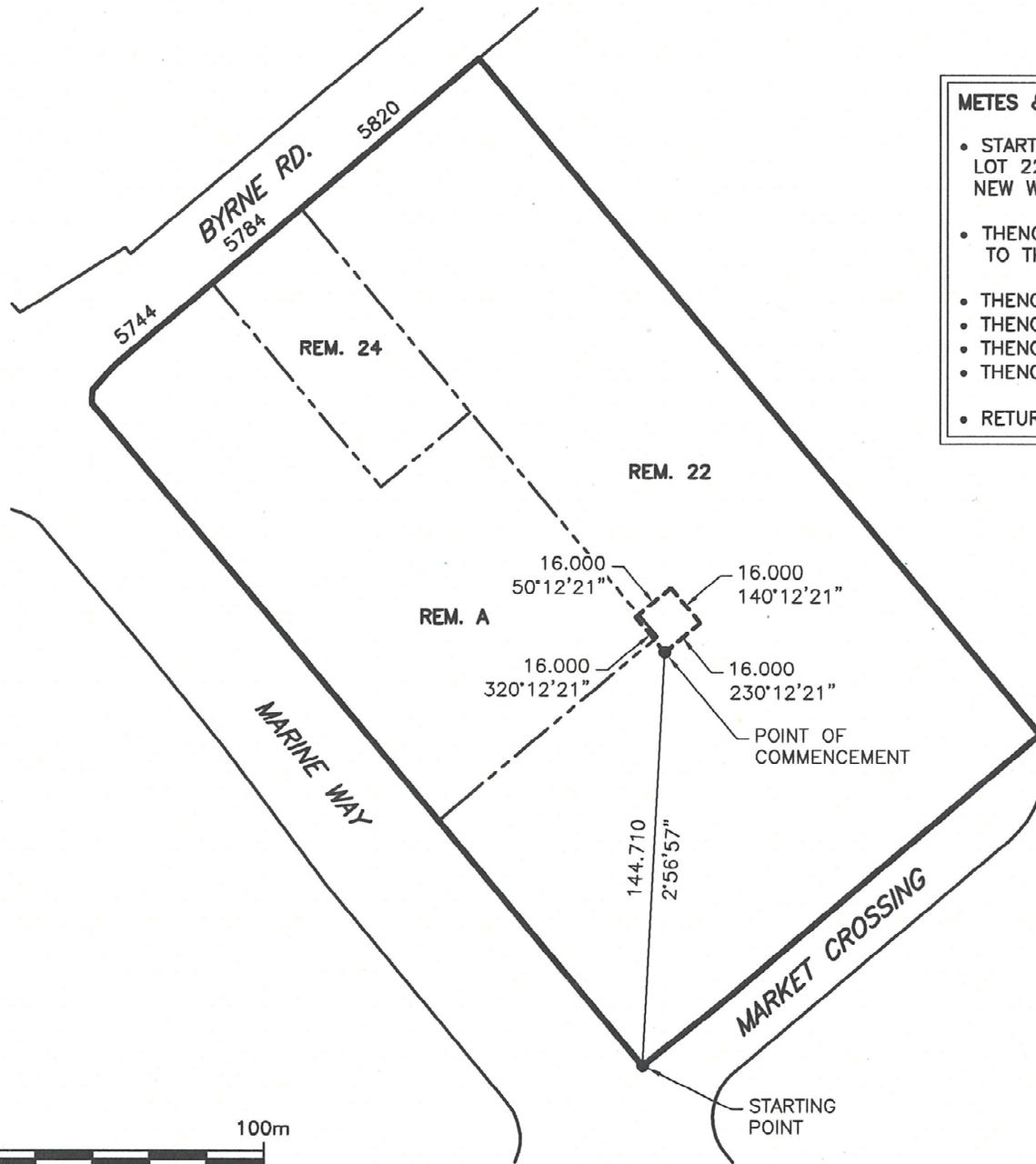
- British Columbia Ministry of Environment. Environmental Protection Division. (2015). *Administrative Guidance 14 on Contaminated Sites: Performance Verification Plans, Contingency Plans, and Operations and Maintenance Plans*. (Version 3.0)
- Keystone Environmental Ltd. (2016a). *Report of Findings – Preliminary Site Investigation – Stage 1 and Stage 2, and Detailed Site Investigation, 5744, 5784 and 5820 Byrne Road, Burnaby, BC*. Dated June 17, 2016.
- Keystone Environmental Ltd. (2016b). *Report of Findings – Human Health and Ecological Risk Assessment, 5744, 5784 and 5820 Byrne Road, Burnaby, BC*. Dated June 17, 2016.
- Keystone Environmental Ltd. (2016c). *Report of Findings – Addendum Human Health and Ecological Risk Assessment, 5744, 5784 and 5820 Byrne Road, Burnaby, BC*. Dated August 4, 2016.
- Keystone Environmental Ltd. (2017a). *Addendum 5744, 5784 and 5820 Byrne Road, Burnaby, BC*. Dated January 31, 2017.
- Keystone Environmental Ltd. (2017b). *Report of Findings – Addendum Human Health and Ecological Risk Assessment, 5744, 5784 and 5820 Byrne Road, Burnaby, BC*. Dated January 31, 2017.

FIGURE



METES & BOUNDS OF EXCLUSION AREA:

- STARTING AT THE SOUTHWEST CORNER OF LOT 22, DISTRICT LOT 155B, GROUP 1, NEW WESTMINSTER DISTRICT, PLAN 27625:
- THENCE 2' 56' 57" FOR 144.710 METRES; TO THE POINT OF COMMENCEMENT.
- THENCE 320' 12' 21" FOR 16.000 METRES;
- THENCE 50' 12' 21" FOR 16.000 METRES;
- THENCE 140' 12' 21" FOR 16.000 METRES;
- THENCE 230' 12' 21" FOR 16.000 METRES;
- RETURNING TO THE POINT OF COMMENCEMENT.



20m 0 100m
SCALE: (approx.)

LEGEND

- SITE
- PROPERTY LINES
- .-.- EXCLUSION AREA