Keystone Environmental
Knowledge-Driven Results

July 24, 2014

Director, Ministry of Environment
Environmental Management Branch
PO Box 9342, Stn Prov Govt
Victoria, BC V8W 9M1

Dear Sir/Madame:

Re: Performance Verification Plan for Certificate of Compliance at 480 North Road, Gabriola Island, BC
MOE Site ID: 3200
Keystone Environmental Project No. 9901

Keystone Environmental Ltd. (Keystone Environmental) has prepared this Performance Verification Plan (PVP) in support of an application for a risked-based Certificate of Compliance (CofC) for the property located at 480 North Road, Gabriola Island, BC (herein referred to as the Site) and a metes and bounds described area situated to the west of the Site (Portion of 440 North Road). The Site has MOE Site ID: 3200.

The PVP presents the principal risk management measures that apply at the Site to ensure the Site CofC remains valid (i.e., the key risk management controls of Schedule B of the Site CofC which must remain in place at the Site). 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, 2014).

DETERMINATION OF REMEDIATION TYPE

Based on the risk management measures for the Site, (i.e., 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, MOE (2014) indicates that a PVP is required, while an operations and maintenance plan may be required.

REQUIRED RISK CONTROLS

A human health and ecological risk assessment (HHERA) was conducted for the Site, and the results were presented in the Human Health and Ecological Risk Assessment Report for Intrascape Developments, 480 North Road, Gabriola Island, BC, dated May, 2014.

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The principal risk controls which must be present or implemented and must be maintained at the Site include the following:

- Quarterly monitoring of gasoline constituents, diesel constituents, PAHs, and metals in drinking water sourced from the on-Site drinking water well (Well Tag Number 55187; prior to treatment) once the drinking water well becomes active. Monitoring is to continue until sufficient data are available to demonstrate an incomplete pathway through stable or diminishing contaminant concentrations (see following condition below), or hydraulic disconnection. This monitoring is in addition to monitoring that may be required as part of the Drinking Water Protection Regulation.
- Mitigation measures are to be implemented to treat groundwater or the drinking water sourced from the on-Site drinking water well should Site-related contamination be identified during monitoring events summarized in the previous bullet. As an alternative to treatment, the decommissioning of the well may be the preferred measure to mitigate risk associated with the presence of elevated contaminant concentrations.
- An additional two groundwater monitoring events that represent seasonal variability at MW10-53 and MW10-70 for, benzene, benzo(a)pyrene, ethylbenzene, methylene chloride, naphthalene, toluene, xylenes, VPHw, and LEPHw to confirm that their concentrations continue to decline as a result of the up-gradient soil remediation efforts.
- It must be demonstrated that the drinking water pathway remains incomplete for any new drinking water well installed within the area of the existing drinking water wells evaluated as long as residual concentrations remain above CSR DW standards.
- Future on Site enclosed buildings must not be constructed within 30 m of fill material placed at Fill Areas 1 and 2 unless a minimum of 1 m of clean fill capping is placed on the fill area(s). Future buildings must also be constructed at-grade.
- Should any construction or underground utility maintenance activities involved with trench excavations take place on-Site, both currently and in the future, that intersect with contaminated excavation vapour, a health and safety plan must be prepared by a qualified health and safety officer to mitigate incidental excavation vapour inhalation by excavation workers.
- The second on-Site drinking water well (Well Tag Number 21043), if found, must be decommissioned unless it is deemed safe for use as a drinking water source by a risk assessment.

REQUIRED ACTIONS TO IMPLEMENT THE REQUIRED RISK CONTROLS

A PVP is required to ensure that the identified risk controls for the Site are present or implemented, and maintained.

Performance verification actions for the Site include the following:

- Inspection by the responsible person or agent annually to ensure that:
  - The drinking water monitoring plan at Well #55187 is conducted as stipulated above.
  - Mitigation measures to prevent exposure to contaminated drinking water have been

implemented if Site-related contamination has been identified during the monitoring of drinking water at Well #55187 (see previous bullet).

- The groundwater monitoring plan is conducted at MW10-53 and MW10-70 as stipulated above.
- The drinking water pathway remains incomplete for any new drinking water well that has been installed within the area of the existing drinking water wells evaluated as long as residual concentrations remain above CSR DW standards.
- On-Site buildings have not been constructed within 30 m of fill material placed at Fill Areas 1 and 2 unless a minimum of 1 m of clean fill capping is placed on the fill area(s) and that future buildings have been constructed at-grade.
- The second on-Site drinking water well (Well Tag Number 21043), if found, has been decommissioned unless it has been deemed safe for use as a drinking water source by a risk assessment. The risk assessment must be made available upon request.
- Health and safety plans have been prepared by a qualified professional prior to trench work at the Site.

Up-to-date records of inspections and results must be maintained by the responsible person (or their agents). These records must be available for inspection by the Director. Other reporting requirements for 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
- A statement signed by an Approved Professional on whether the required risk controls have been implemented and are being met must be submitted to the Director every 2 years within 90 days of the anniversary of the date of issuance of the Certificate of Compliance for the Site or as otherwise approved by the Director.
- If requested by the Director, a report signed by an Approved Professional must be submitted for review to the Director and must include the following:
  - An evaluation of the performance of the risk controls
  - Recommendations for modification of the performance verification plan, along with supporting rationale
  - Interpretation of current and cumulative results of the performance verification actions undertaken
  - Supporting Documentation

SUMMARY RATIONALE AND CONCLUSION

The human health and ecological risk assessment (HHERA) identified risks for Construction Workers and Utility Workers from exposure to substances in trench vapours. However, with an appropriate health and safety plan and proper protocols such as the use of personal protective equipment (PPE), risks to these receptors will be mitigated.

Vapour inhalation risks for indoor patrons of current and future on-Site enclosed buildings and current off-Site buildings were not identified. Considering the current grading of the Site, in order for risks to remain acceptable for indoor patrons of future on-Site enclosed buildings, future construction must not take place within 30 m of Fill Areas 1 and 2 unless an uncontaminated cap is present. Future buildings must also be constructed at-grade. Current and future exposure pathways and risks of vapours to off-Site buildings were not identified.

The drinking water pathway for human receptors was considered incomplete based on the hydrogeology of the Site, the proximity of the on-Site drinking water well (Well Tag Number 55187) relative to the delineated groundwater contamination, and analytical results of the drinking well water. To demonstrate that conditions remain acceptable in the future, it is recommended that regular monitoring of the on-Site drinking water supply be conducted for metals and gasoline and diesel-related constituents, including the standard suite of PAHs. The second on-Site water well (Well Tag Number 21043), which could not be located by Site investigators or the property owner, should be decommissioned if found unless a risk assessment confirms that it is safe for use as a drinking water source.

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

GENERAL LIMITATIONS AND CONFIDENTIALITY

Findings presented in this report are based upon the results of a field investigation including a chemical injection remediation plan, the drilling of boreholes, construction of monitoring wells, collection and analysis of soil, water, and vapour samples. Geologic observations and analytical results reflect conditions encountered at a specific test location. Site conditions (geologic, hydrogeologic, and chemical characterization) may vary from that extrapolated from the data collected during this investigation. Consequently, while findings and conclusions documented in this report have been prepared in a manner consistent with that level of care and skill normally exercised by other members of the environmental science and engineering profession practising under similar circumstances in the area at the time of the performance of the work, this report is not intended, nor is it able to provide a totally comprehensive review of present or past site environmental conditions.

This report has been prepared solely for the internal use of Intrascape Developments, and for review by the BC Ministry of Environment, the Contaminated Sites Approved Professionals (CSAP) Society, and Scott Steer, pursuant to the agreement between Keystone Environmental Ltd. and Intrascape Developments. A copy of the general terms and conditions associated with this agreement is attached in the Appendix. By using this report, Intrascape Developments, BC Ministry of Environment, CSAP, and Mr. Steer agree that they will review and use the report

in its entirety. Any use which other parties make of this report, or any reliance on or decisions made based on it, are the responsibility of such parties. Keystone Environmental Ltd. accepts no responsibility for damages, if any, suffered by other parties as a result of decisions made or actions based on this report.

If you should have any questions, please do not hesitate to contact me.

Sincerely,

Keystone Environmental Ltd.

Original signed by

Nicole MacDonald, B.Sc., P.Ag.
Project Manager

Original signed by

Andrew Wan, M.ET., R.P.Bio.
Senior Risk Assessor

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ATTACHMENT:

- References

REFERENCES

REFERENCES

Keystone Environmental Ltd. 2014. Report of Findings – Human Health and Ecological Risk Assessment, 480 North Road, Gabriola Island, BC.

MoE. 2014. Administrative Guidance 14. Performance Verification Plans, Contingency Plans, and Operations and Maintenance Plans. BC Ministry of Environment, February 2014.