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**PERFORMANCE VERIFICATION PLAN  
Former Ministry of Transportation and Infrastructure (MOTI) Yard  
1001 Centennial Way, Squamish, BC**

**Ministry of Transportation and Infrastructure**

**September 2016  
SLR Project No.: 201.88511.00000.0008**



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Prepared by  
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for

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September 2016

Prepared by:

A handwritten signature in blue ink, appearing to read "Barbara Glijer", is written over the printed name and title.

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**CONFIDENTIAL**

Distribution: 2 hard copies plus 1 electronic copy – Ministry of Transportation and Infrastructure  
1 PDF copy – BC Ministry of Environment  
1 hard copy – SLR Consulting (Canada) Ltd.  
1 hard copy – CSAP Approved Professional

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## DRAWING

Drawing 1: Site Plan and Investigative Locations

## 1.0 INTRODUCTION

SLR Consulting (Canada) Ltd. (SLR), on behalf of the Ministry of Transportation and Infrastructure (MOTI), prepared this Performance Verification Plan (PVP) for the former Squamish Works Yard located at 1001 Centennial Way, Squamish, BC (hereafter referred to as the "Site").

The PVP presents risk management controls to be implemented at the Site to ensure that the risk-based Certificate of Compliance (CoC) will remain valid. This report was prepared in accordance with BC Ministry of Environment (MOE) Administrative Guidance 14: *Performance Verifications Plans, Contingency Plans, and Operations and Maintenance Plans* (BC MOE, 2014).

## 2.0 BACKGROUND

The Site is a triangular lot that covers an area of approximately 4.3 hectares, which is split into two sections by Highway 99 (northern section is 2.8 hectares and the southern section is 1.5 hectares). The northern portion of the Site is currently vacant (unpaved) and the southern portion of the Site is used by the District of Squamish as a plant nursery. The Site legal description is as follows:

- Lot 2 of the West ½ of Section 2, Township 50, New Westminster, District Plan 19496, Except Part Road on Plan BVP33206.

A Site plan with former features is shown on Drawing 1.

The northern portion of the Site, the former MOTI storage and maintenance yard (MOTI Yard) was the focus of the environmental investigation and the subject of the Human Health and Ecological Risk Assessment (HHERA) (SLR, 2016). The southern portion is used by the District of Squamish as a plant nursery. As no Areas of Potential Environmental Concern (APECs) or Schedule 2 uses were identified, the southern portion of the Site was excluded from further investigation and HHERA. However, the risk controls presented in this PVP apply to the entire Site.

Investigations and remediation programs were conducted at the MOTI Yard by several consultants between 1998 and 2013, and by SLR in 2015 and 2016. The investigations identified petroleum hydrocarbon (PHC) related contamination, including 1,2-dibromoethane used as an anti-knocking agent in leaded gasoline, in soil and groundwater, as well as chloride in groundwater, exceeding applicable CSR standards. This contamination was associated mainly with the former drain/catch basin and former underground storage tanks formerly present at the MOTI Yard. Most of the soil contamination from the MOTI Yard has been removed through remedial excavation as part of the facility decommissioning and through pump and treat programs of groundwater.

The HHERA for the MOTI Yard was completed by SLR in September 2016 to estimate potential risk to human and ecological receptors from potential exposure to PHC related contamination (SLR, 2016). This HHERA was conducted under the assumption that the MOTI Yard will be developed for commercial use and a building may be constructed as slab-on-grade in the future. Additionally, potable water use was assessed under a hypothetical future water use scenario. Receptors of concern and pathways quantified at the MOTI Yard included:

- Commercial Worker (adults) – ingestion of groundwater, dermal exposure to groundwater and inhalation of volatile organic compounds (VOCs) emitted from groundwater.

Results of the HHERA indicated unacceptable risk to the commercial worker receptors from exposure to 1, 2-dibromoethane via ingestion of groundwater.

Groundwater from the MOTI Yard may discharge to Loggers Lane Creek, the closest downgradient surface water body located 470 m to the south of the MOTI Yard. Light Extractable Petroleum Hydrocarbons in water (LEPHw) and naphthalene were identified as contaminants of potential concern (COPCs) for the protection of aquatic ecological receptors. However, potential exposure to aquatic receptors through contact with groundwater is considered an incomplete pathway as LEPHw and naphthalene were vertically and horizontally delineated within the MOTI Yard boundary and their concentrations are stable and/or decreasing. As such, these parameters are not expected to reach the aquatic receiving environment.

### **3.0 REQUIRED RISK CONTROLS**

The required risk controls to manage potential risk identified in the HHERA included the following:

- Groundwater from the Site must not be used as a drinking water source.

### **4.0 REQUIRED ACTIONS TO IMPLEMENT THE REQUIRED RISK CONTROLS**

Based on consideration of current/future land use at the Site and the results of HHERA (SLR, 2016), the following performance verification actions are recommended and will be the responsibility of the current Site owner, the Ministry of Transportation and Infrastructure (MOTI,) or a future owner if the Site was sold:

1. Inclusion of an advisory (as item (a) in clause 2 of Schedule B of any Certificate of Compliance issued for the site) that “The groundwater from the Site must not be used as a drinking water source”.

Notification to the Director is required if the subject of this advisory is breached. The listing of the risk management measure in Schedule B of the CoC meets this requirement.

### **5.0 SUMMARY RATIONALE FOR SELECTING REQUIRED PVP ELEMENTS**

The Site is classified as a Risk-Based Remediation Type 2 Site on the basis that risk management measures are required, but failure of risk management measures will not result in the imminent exposure of site contaminants to humans, or discharge of contaminants to the aquatic receiving environment at concentrations above BC water quality guidelines, or contaminant spreading at concentrations above upper cap concentrations.

The incremental lifetime cancer risk (ILCR) derived for a commercial worker (adult) receptor through ingestion of 1,2-dibromoethane in groundwater assumed to be used as a potable water source in the future was 2.7E-05. The excess cancer risk derived for this receptor for combined exposure through oral and dermal groundwater pathways remained unchanged, indicating that the ingestion pathway was the major contributor to the overall risk derived for the commercial worker receptor. Based on the 1,2-dibromoethane risk estimates in excess of the CSR risk-based standard of 1E-05, protection of commercial workers by restricting the installation of potable water well on the Site was included as a risk management measure in Schedule B of the CoC.

## 6.0 REFERENCES

BC MOE. 2014. British Columbia Ministry of the Environment. Administrative Guidance 14: Performance Verification Plans, Contingency Plans, and Operations and Maintenance Plans. Version 1.0. February, 2014.

SLR, 2016. Human Health and Ecological Risk Assessment. Former Ministry of Transportation and Infrastructure (MOTI) Yard. 61001 Centennial Way, Squamish, BC. September, 2016.

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\_PVP Report\1. 201.88511 SQUAMISH PVP.Rev Sept.docx

## **DRAWING**

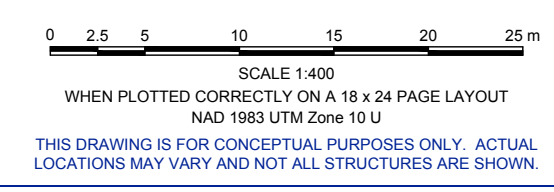
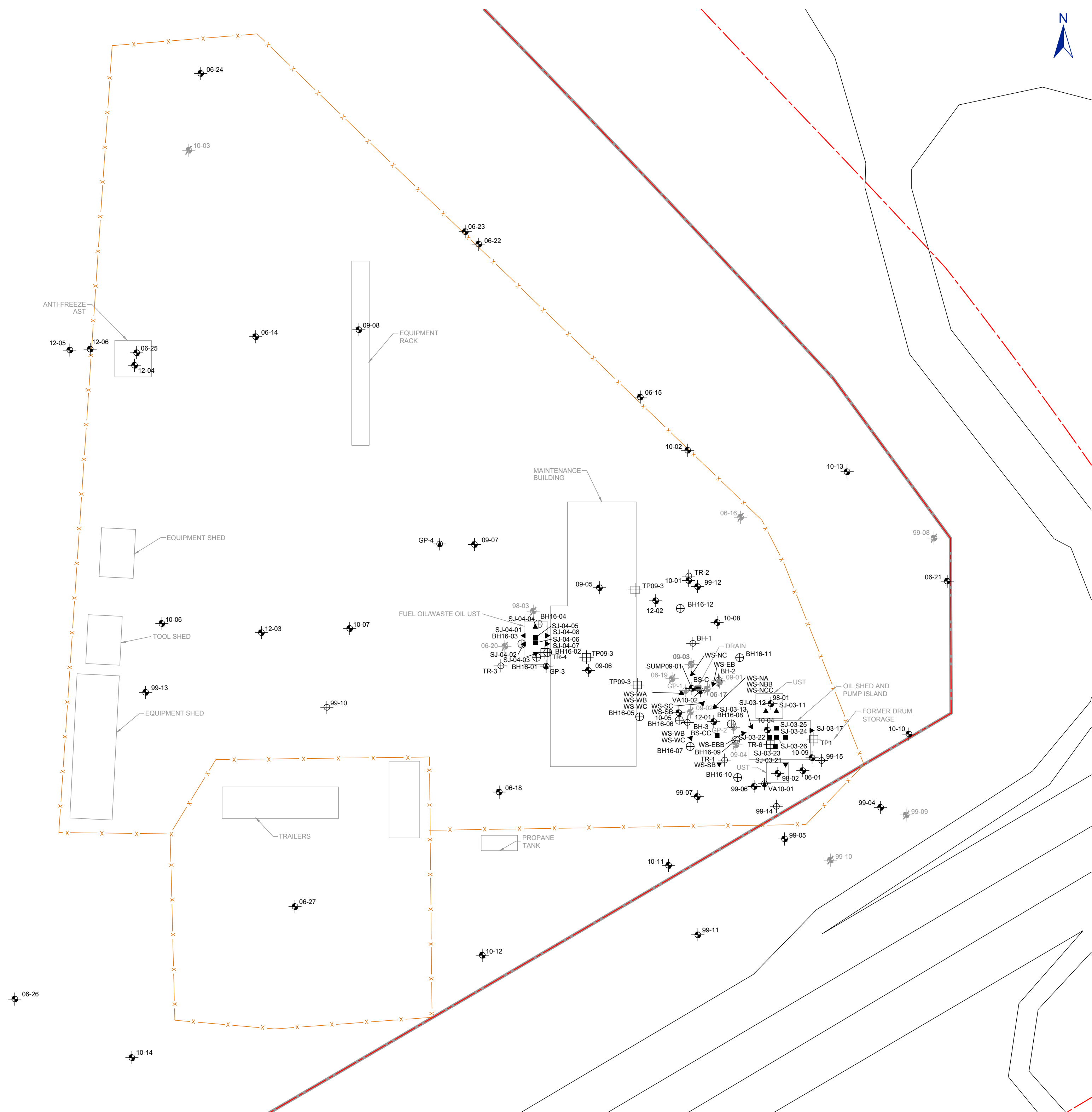
Performance Verification Plan  
Former Ministry of Transportation and Infrastructure (MOTI) Yard  
1001 Centennial Way, Squamish, BC  
SLR Project No.: 201.88511.00000.0008

NOTES:  
 REFERENCED FROM SQUAMISH GIS MAP VIEWER, EXP SERVICES INC. SITE FACILITIES & EXPLORATION LOCATIONS - 2012 AND INFERRED GROUNDWATER FLOW 2011 DRAWINGS, PROJECT No. VAN-06102156-03

SURVEY INFO: BUNBURY & ASSOCIATES, MAY 2015

LEGAL DESCRIPTION:  
 LOT 2 - PLAN VAP19496 PART W 1/2 SECTION 2 PID 007004966 SQUAMISH, BC

- LEGEND:
- PROPERTY BOUNDARY
  - ▭ SITE BOUNDARY
  - ✕ FENCE
  - ▭ FORMER FACILITY/FEATURE
  - ⊕ BOREHOLE LOCATION
  - ⊕ BOREHOLE LOCATION (OTHERS)
  - ⊕ BOREHOLE LOCATION COMPLETED AS A MONITORING WELL (OTHERS)
  - ⊕ BOREHOLE LOCATION COMPLETED AS A MONITORING WELL (DESTROYED)(OTHERS)
  - ⊕ SOIL VAPOUR PROBE LOCATION (OTHER)
  - ⊕ SOIL VAPOUR PROBE LOCATION (OTHER) (DESTROYED)
  - ⊕ TEST PIT (OTHER)
  - SOIL SAMPLE, BASE
  - ▲ SOIL SAMPLE, WALL



**MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE**  
 1001 CENTENNIAL WAY  
 SQUAMISH, BC

PERFORMANCE VERIFICATION PLAN

SITE PLAN AND INVESTIGATIVE LOCATIONS

|                             |             |
|-----------------------------|-------------|
| Date: September 8, 2016     | Drawing No. |
| Project No. 201.88511.00008 | 1           |

Cadfile name: S\_201-88511-00008-A3.dwg





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