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**PERFORMANCE VERIFICATION PLAN  
11474 124 STREET, SURREY, BC**

**MOTI Site No.: 78-87**

**February 2017  
SLR Project No.: 201.88514.00.0078**



**PERFORMANCE VERIFICATION PLAN**

**11474 124 STREET**

**SURREY, BC**

**MOTI Site No.: 78-87**

**SLR Project No.: 201.88514.00.0078**

Prepared by  
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for

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February 2017

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**CONFIDENTIAL**

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1 copy – BC Ministry of Environment  
1 copy – SLR Consulting (Canada) Ltd.  
1 copy – CSAP Approved Professional

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## DRAWING

Drawing 1: Site Plan with Investigation 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 property located at 11474 124 Street in Surrey, BC (the “site”), on the south side of the South Fraser Perimeter Road (SFPR). Prior to consolidation of the lots, the individual properties were located between 11476-12400 124 Street and 12434-12534 116 Avenue, Surrey, BC (MOTI Sites No. 78-87).

The PVP presents risk management controls to be implemented at the site to ensure that 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, comprised of ten vacant and contiguous properties (Site No. 78 - 87) is located in the northeastern part of Surrey. The properties were expropriated by MOTI in 2009 for SFPR construction. The northern portion of the lot is now under the SFPR and the remaining portion of the lot (located south of the SFPR), is now consolidated as the subject site.

The historical operations at the site and placement of preload dredged material from the Fraser River resulted in contamination of soil and/or groundwater with pentachlorophenol, heavy extractable petroleum hydrocarbon (HEPH), polycyclic aromatic hydrocarbons (PAHs) and/or metals. Following removal of impacted soil in October 2015, soil parameters met applicable CSR standards and only PAH parameters and dissolved arsenic remained in groundwater above applicable standards. Elevated concentrations of arsenic may be associated, at least in part, with natural conditions i.e. site located within marine deposits and presence of peat which provides reducing conditions that facilitate release of arsenic from soils.

The Human Health and Ecological Risk Assessment (HHERA) for the site was completed by SLR in February 2017 to estimate potential risk to human and ecological receptors from potential exposure to arsenic and PAH parameters remaining at the site above applicable CSR standards. This HHERA was conducted under the assumption that the current industrial land (IL) use designation for the site will remain unchanged in the future and hypothetically it has been assumed that groundwater will be used as a source of potable water by persons working at the site (industrial workers).

Human receptors of concern and pathways quantified from exposure to arsenic identified as a contaminant of potential concern (COPC) in groundwater included:

- Industrial Worker (adults) – ingestion of groundwater and dermal contact with groundwater.

Results of the HHERA indicated unacceptable risk to the industrial worker receptor from exposure to arsenic in groundwater. Specifically, incremental lifetime cancer risk (ILCR) derived for the ingestion of groundwater pathway resulted in ILCR (1.2E-04) exceeding the CSR risk based standard of 1E-05. The ingestion pathway was the major risk driver contributing almost 100% to the overall risk estimated for the industrial worker receptor.

Groundwater from the site may discharge to surface water, Fraser River, located approximately 230 m from the site. Anthracene, phenanthrene and pyrene in groundwater were identified as preliminary COPCs for the protection of aquatic life upon potential discharge of site's groundwater to the Fraser. However, because the 95% UCLM concentrations were less than screening benchmarks, the groundwater to surface water pathway was considered complete but insignificant based on the overall site COPC concentrations.

### **3.0 REQUIRED RISK CONTROLS**

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

- The groundwater at 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, 2017), the following performance verification actions are recommended and will be the responsibility of Suncor:

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 at 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 imminent exposure of contaminants to terrestrial ecological receptors at levels 10 times site-specific risk-based concentrations, or contaminant spreading at concentrations above upper cap concentrations.

The excess cancer risk (ECR) derived for the industrial worker from exposure to arsenic in groundwater hypothetically assumed to be used as a potable water source in the future through ingestion and dermal contact (ECR = 1.2E-04) exceeded the CSR risk-based standard of 1E-05; the ingestion pathway contributing almost 100% to the overall cancer risk. Based on the arsenic risk estimates in excess of acceptable standard, protection of industrial workers by restricting the installation of potable water well at 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.

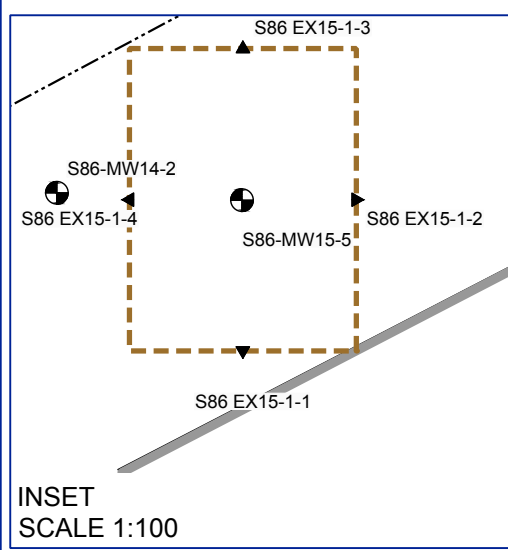
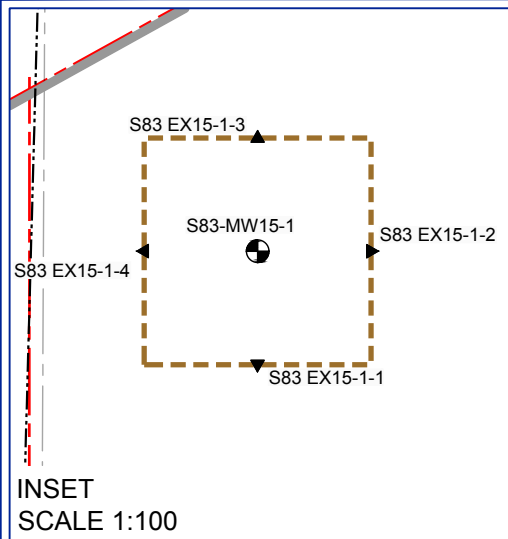
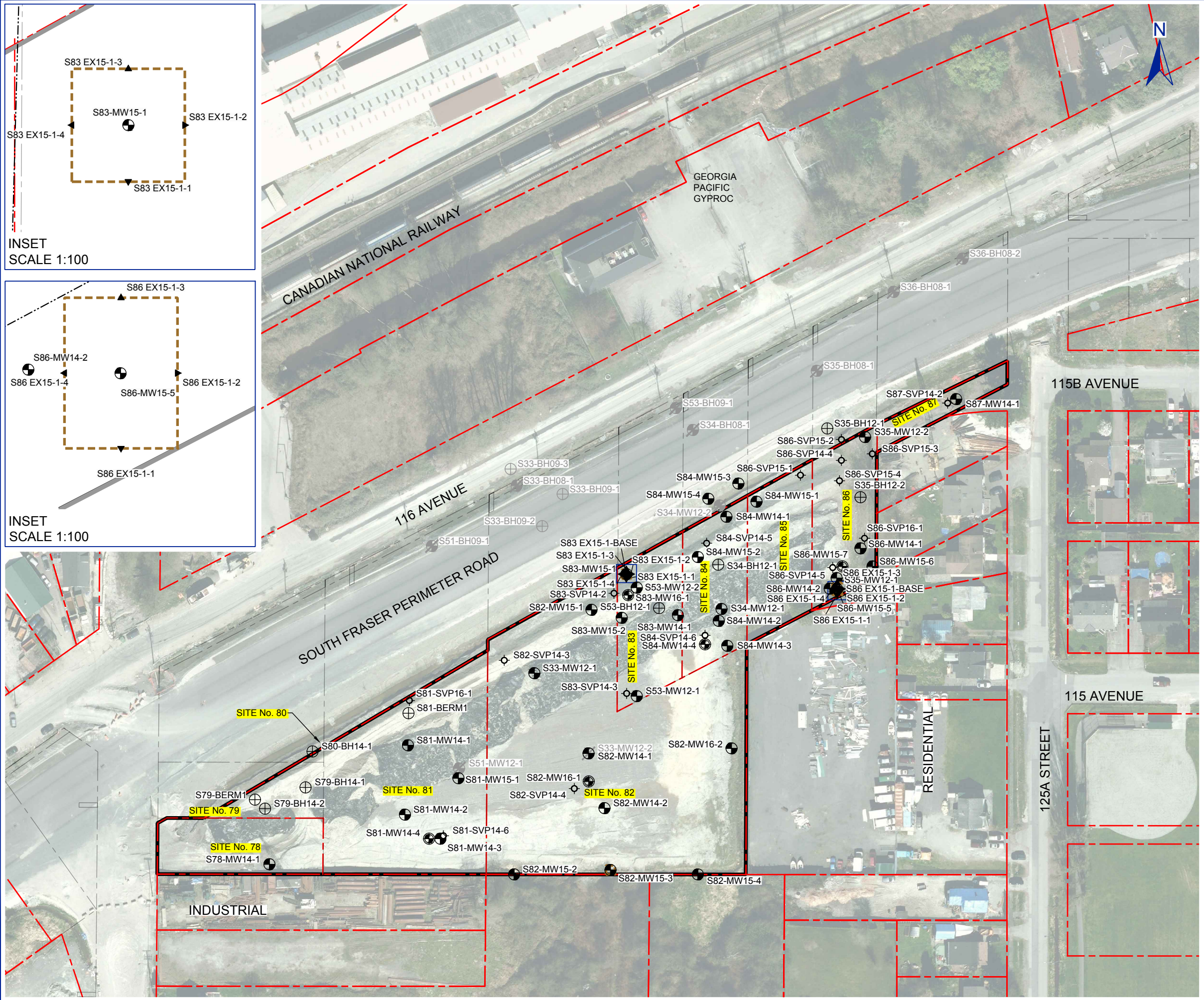
SLR, 2017. Human Health and Ecological Risk Assessment. 11476–12400 124 Street and 12434-12534 116 Avenue, Surrey, BC. MOTI Site No. 78 – 87. May 2016.

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## **DRAWING**

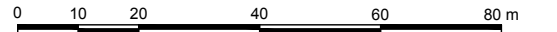
Performance Verification Plan  
11474 124 Street  
Surrey, BC  
SLR Project No.: 201.88514.00.0078



NOTES:  
 REFERENCED FROM: CITY OF SURREY OPEN DATA. IMAGERY: © 2016 CITY OF SURREY (IMAGE DATE: 2013).

LOCATION OF BOREHOLES ARE APPROXIMATIONS. BOREHOLES WERE COVERED AND THEREFORE COULD NOT BE SURVEYED

- LEGEND:
- PROPERTY BOUNDARY
  - FORMER PROPERTY BOUNDARY
  - SITE BOUNDARY
  - LIMITS OF EXCAVATION
  - BOREHOLE LOCATION
  - BOREHOLE LOCATION (DESTROYED)
  - BOREHOLE LOCATION COMPLETED AS A MONITORING WELL
  - BOREHOLE LOCATION COMPLETED AS A DEEPER MONITORING WELL
  - BOREHOLE LOCATION COMPLETED AS A MONITORING WELL (DESTROYED)
  - SOIL VAPOUR PROBE LOCATION
  - SOIL SAMPLE, BASE
  - SOIL SAMPLE, WALL



SCALE 1:1,250  
 WHEN PLOTTED CORRECTLY ON A 11 x 17 PAGE LAYOUT  
 NAD 1983 UTM Zone 10 U

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE  
 MOTI SITES 78-87  
 11474 124TH STREET  
 SURREY, BC

PERFORMANCE VERIFICATION PLAN

**SITE PLAN WITH INVESTIGATION LOCATIONS**

Date: February 17, 2017	Drawing No. 1
Project No. 201.88514.00000	



Cadfile name: S\_201-88514-00000-N4.dwg





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