

Sampling and Analysis Plan

Soil Remediation Project
Breakwater Marina
5603 North Waterfront Drive
Tacoma, WA 98407

EcoCon, Inc. (ECI) has been hired to perform soil and groundwater remediation services for the Breakwater Marina located at 5603 North Waterfront Drive, Tacoma, Washington (Subject Site).

IMPACTED SOIL REMOVAL

ECI plans to excavate an area approximately 125 feet long by approximately 12 feet wide by 8-10 feet deep to remove petroleum impacted soil at the Site. The excavation will be subdivided into cells approximately 20 feet long by 12 feet wide. Excavated soil will be loaded into trucks and transported to Land Recovery Inc. in Graham, Washington for disposal. Soil disposal has been approved by the Tacoma Pierce County Health Department, waste disposal authorization number 1855.

REGULATORY COMPLIANCE

Regulatory compliance for this project is based on the Washington Administrative Code (WAC) 173-340 – Model Toxic Control Act (MTCA) - RCW Chapter 70.105D, implemented by the Washington State Department of Ecology (Ecology). Pursuant to Chapter 70.105D RCW, Ecology has established cleanup standards and requirements for the cleanup actions (MTCA).

The rules establishing these standards and requirements were developed by Ecology in consultation with the Science Advisory Board (established under the Act) and with representatives from local government, citizen, environmental, and business groups. The rules were first published in February 1991, with amendments in January 1996, February 2001, and October 2007.

CONTAMINANTS OF CONCERN & MTCA-A CLEANUP LEVELS

Based on historical Site activities, the contaminants of concern (COCs) at the Site were identified as gasoline (GRO), volatile organic compounds benzene, toluene, ethylbenzene, and xylene (BTEX), diesel and heavy oil range organics (DRO/HRO) and Total Lead

The concentrations of these contaminants in the samples collected will be compared to the MTCA Method-A Soil Cleanup Levels for Unrestricted Land Use and the Method-A Groundwater Cleanup Levels. These cleanup levels are presented below.

Table 1: Contaminants of Concern

Method-A Cleanup Levels (MTCA-A) for Soil and Groundwater (MTCA Cleanup Regulation 173-340-900: Tables 720-1 and 740-1)		
Contaminant of Concern (COCs)	Soil Cleanup Levels (CUL) - mg/kg	Groundwater Cleanup Levels (CUL) - ug/l
Diesel-Range Organics (DRO)	2,000	500
Heavy Oil-Range Organics (HRO)	2,000	500
Gasoline-Range Organics (GRO)	100/30 ¹	1000/800 ²
Benzene	0.03	5
Toluene	7	1,000
Ethylbenzene	6	700
Xylenes	9	1,000
Total Lead	250	15

SAMPLE COLLECTION METHODOLOGIES

Sampling activities will be completed by properly trained and qualified environmental professionals. Soil samples will be collected from the floor and sidewall of excavation. Soil samples will be collected from the excavation floor at 10 foot intervals and from the excavation sidewalls at 15 foot intervals. Approximately twenty-four to twenty-six samples are anticipated.

Soil sample locations will be determined in the field by a qualified environmental professional based on field screening and other site observations. All soil samples will be collected in accordance with industry standard sampling techniques including the Environmental Protection Agency (EPA) 5035 sampling collection method. Each discrete soil samples will be placed in new, laboratory provided containers and assigned unique sample identification numbers (e.g. S1-4'-040215). Samples will then be placed into new analyte specific laboratory provided containers and maintained at 4° Celsius until delivered to the on-site laboratory for analysis under industry standard chain of custody protocols.

SAMPLE CHEMICAL ANALYSIS

Each sample will be analyzed for gasoline- (GRO) and diesel-range organics (DRO) by Ecology Method NWTPH-Gx and NWTPH-Dx, and for select volatile aromatic hydrocarbons [benzene, toluene, ethylbenzene and total xylenes (BTEX)] by EPA Method 8021b. Select samples will be submitted to the

¹ Gasoline Range Organics: Gasoline mixtures without benzene and the total of ethylbenzene, toluene and xylene are less than 1% of the gasoline mixture has a soil CUL = 100 mg/kg. All other gasoline mixtures have a soil CUL = 30 mg/kg. For groundwater, the CUL is 1000 ug/l for gasoline mixtures without benzene and 800 ug/l for all other gasoline mixtures.

Soil Excavation Sampling and Analysis Plan

5603 North Waterfront Drive

Tacoma, Washington

April 2, 2015

laboratory for total lead analysis by EPA Method 7010. Sample analyses will be completed by Libby Environmental, an Ecology-accredited environmental laboratory.

PROJECT REPORTING

Following soil excavation and sampling activities, a Remedial Action Report will be completed detailing the excavation activities, site conditions and sample analytical results. This report will be completed within ten days of receiving the final analytical results.

Enclosures:

Project Figures

- Site Location Map
- Soil Sample Location Map



Subject Site
 5603 North Waterfront Drive
 Tacoma, Washington

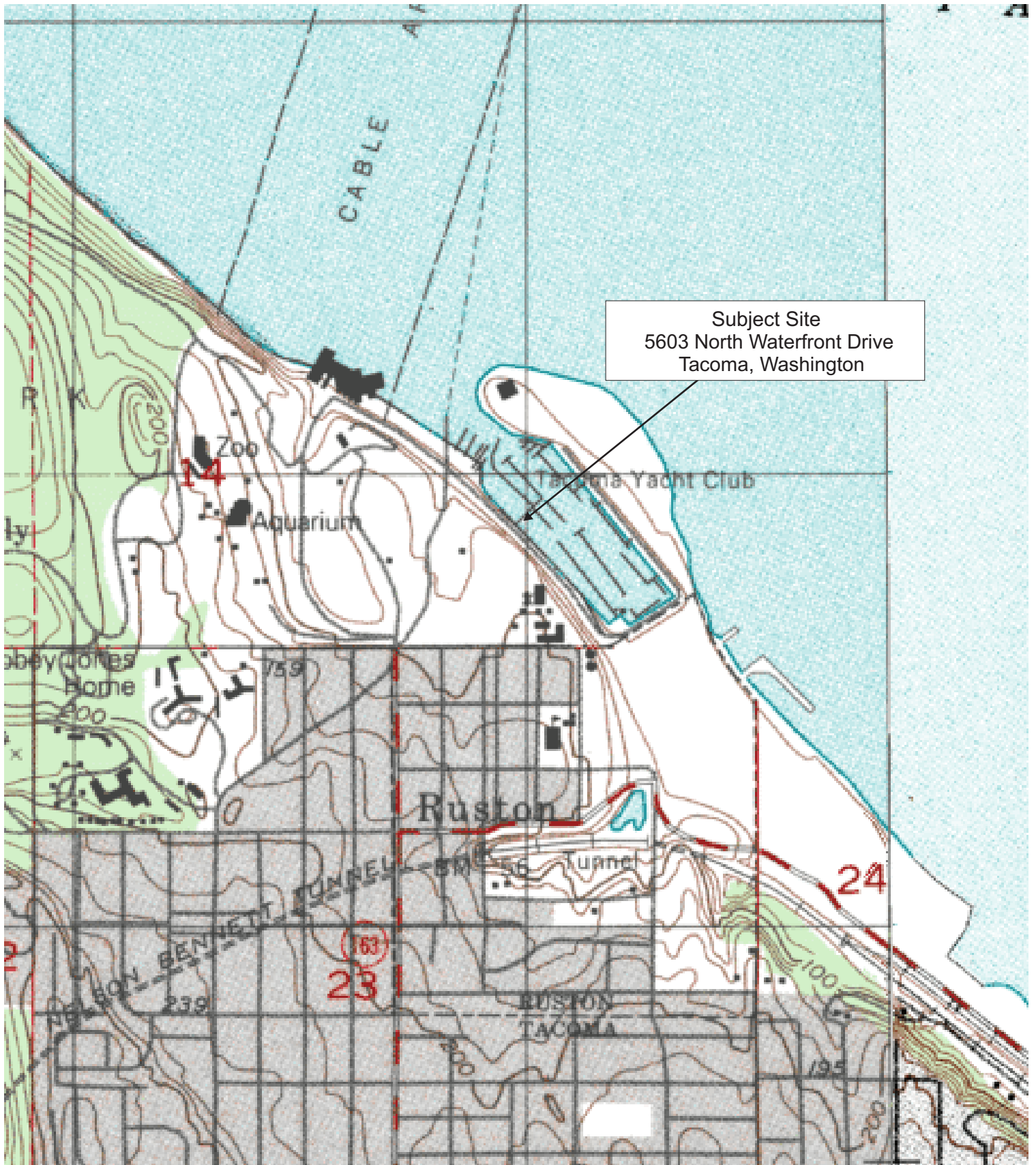


Project Location Map
 Cleanup Action Plan
 5603 North Waterfront Drive
 Tacoma, Washington

Date: February 9, 2015
 Completed By: K. Spencer
 Reviewed By: S. Spencer
 Version: ECI-001
 Project No.: 0483-05

Figure No.:
01
 Sheet 01 of 05

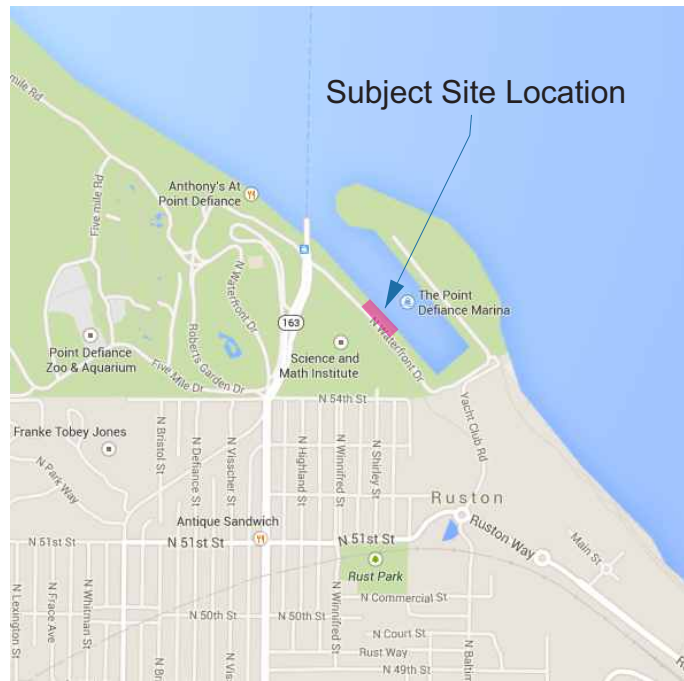




Site Topographic Map
 Cleanup Action Plan
 5603 North Waterfront Drive
 Tacoma, Washington

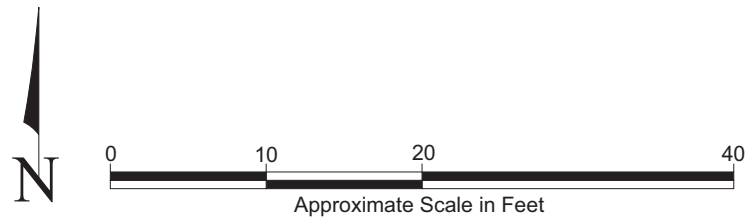
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Figure No.:
02
 Sheet 02 of 05



Explanation

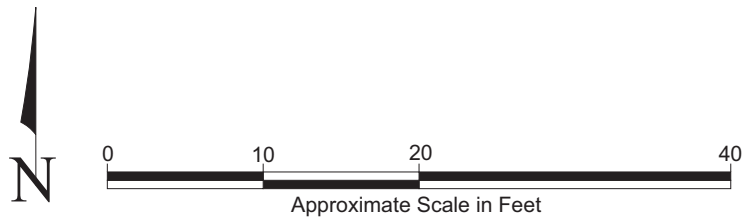
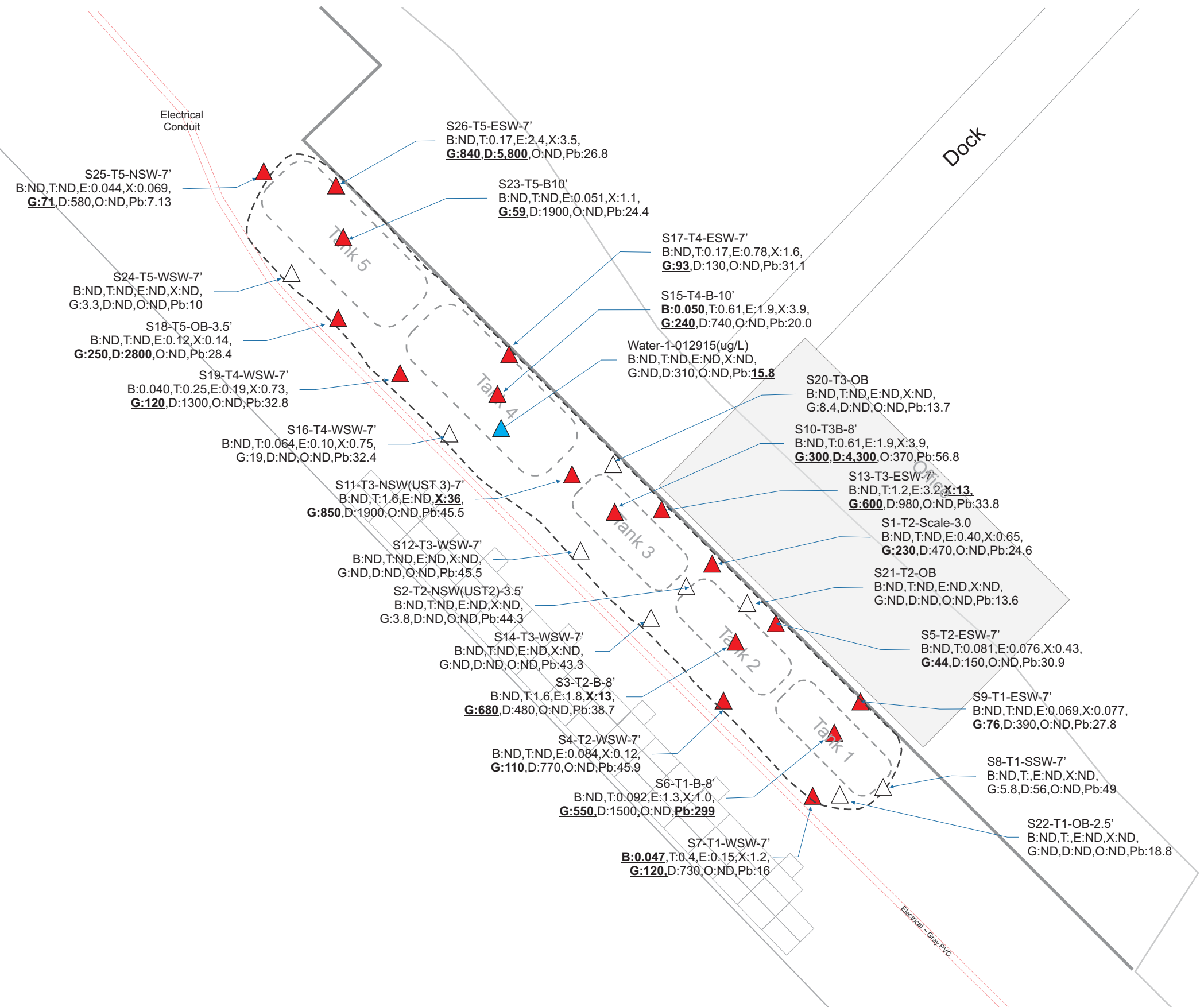
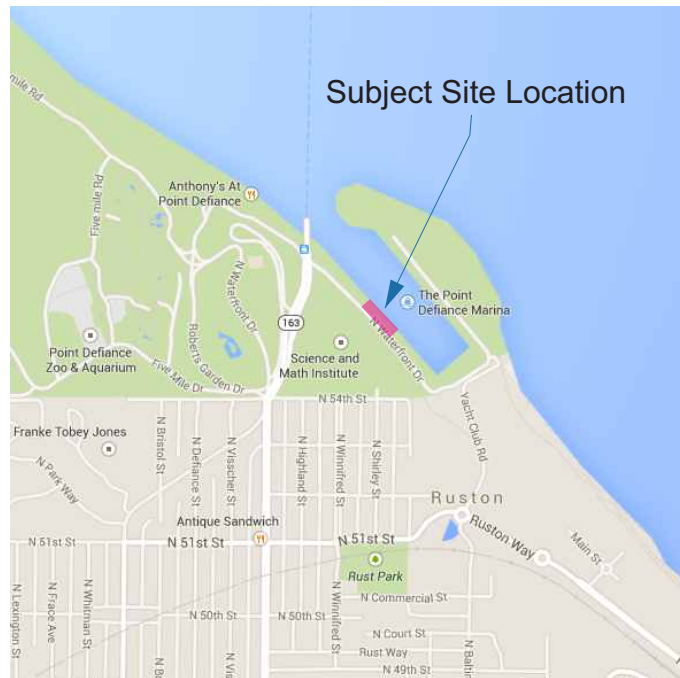
- Approximate Boring Locations reported Below the MTCA A CUL
- Groundwater Sample Exceeds MTCA Method A CUL for DRO (DRO Concentration 34,600 ug/L) (Previous Sampling Event)



Boring Locations Map
 Cleanup Action Plan
 5603 North Waterfront Drive
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Figure No.:
03
 Sheet 03 of 05



- Explanation**
- △ Sample Location Below MTCA
 - ▲ Sample Location Exceeding MTCA
 - G: Gasoline Range Organics
 - D: Diesel Range Organics
 - O: Oil Range Organics
 - Pb: Total Lead

- MTCA-A Cleanup Levels**
- Gasoline Range Organics: 100/30* mg/kg
 - Diesel Range Organics: 2000 mg/kg
 - Oil Range Organics: 2000 mg/kg
 - Total Lead: 250 mg/kg

Soil Sample Location Map
Cleanup Action Plan
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 Tacoma, Washington

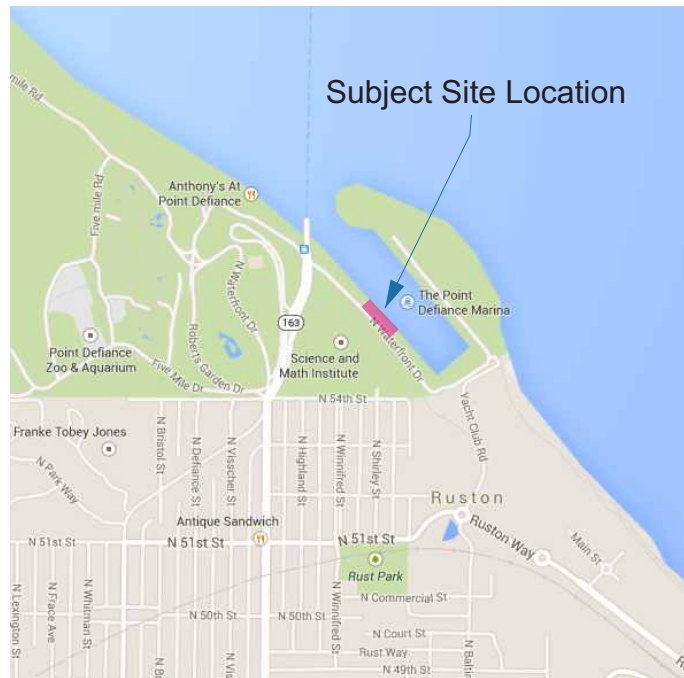
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Figure No.:
04
 Sheet 04 of 05



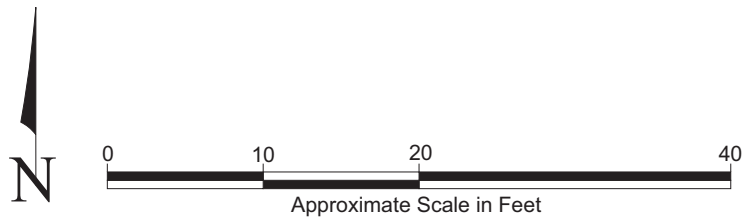


Approximate Extent of Petroleum Contaminated Soil (PCS)



Explanation

- Estimated Confirmation Sample Locations
- Sample Location Below MTCA
- Sample Location Exceeding MTCA
- Tank Excavated Area
- Presumed Contaminated Area To Be Excavated
- Proposed Monitoring Well Locations



Estimated Remedial Excavation & Proposed Monitoring Well Location Map
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Figure No.: **05**
 Sheet 05 of 05