Addendum No. 7 to the Work Plan for RI/FS and IA for the Solid Wood Incorporated Site

Supplemental Sediment Field Sampling and Analysis Plan

PREPARED FOR:

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ACRONYMS AND ABBREVIATIONS

Acronym	Explanation
bgs	below ground surface
City	City of Olympia
cm	centimeters
Ecology	Washington State Department of Ecology
FSAP	Field Sampling and Analysis Plan
MDL	Method Detection Limit
QC	Quality Control
PQL	Practical Quantitation Limit
RI/FS	Remedial Investigation/Feasibility Study
Site	Solid Wood Incorporated Site
TPH	Total Petroleum Hydrocarbons
TPH-D	Total Petroleum Hydrocarbons in the Diesel Range
TPH-HO	Total Petroleum Hydrocarbons in the Heavy Oil Range

SECTION 1 – INTRODUCTION

A remedial investigation/feasibility study (RI/FS) and interim actions (IAs) are being conducted at the Solid Wood Incorporated Site in Olympia, Washington (Site). The RI/FS and IA are being conducted under Agreed Order No. DE-08-TCPSR-5415 between the City of Olympia (City) and the Washington State Department of Ecology (Ecology) to investigate the nature and extent of Site contamination and to aid in the development of cleanup actions (Parametrix 2008).

Previous sediment investigations, conducted as part of the RI/FS and IAs, have characterized the concentrations of (1) Sediment Management Standards (SMS) constituents (WAC 173-204-320–Table 1), (2) pentachlorophenol, and (3) total petroleum hydrocarbons (TPH) in sediment adjacent to the upland Site (Parametrix 2008, 2010, 2011a, 2011b). None of the concentrations of these constituents exceeded applicable SMS Chemical Criteria (i.e., WAC 173-204-320 or WAC 173-204-520); however, concentrations of the TPH-Heavy Oil fraction (TPH-HO) and TPH-Diesel faction (TPH-D) exceeded an Ecology-derived screening level of 100 mg/kg (Figure 2). Consequently, Ecology has required that the City collect additional samples to further characterize TPH-HO/TPH-D concentrations in sediment adjacent to the upland Site.

This Field Sampling and Analysis Plan (FSAP) is Addendum No. 7 to the Work Plan for the RI/FS and IA for the Solid Wood Incorporated Site (Parametrix 2008). The purpose of this FSAP is to present specific procedures for the collection and analysis of sediment samples at the Site to further characterize the extent of TPH-HO/TPH-D contamination in sediment adjacent to the upland Site.

1.1 Background

The Site is approximately 17 acres in size and is located at 700 West Bay Drive NW in Olympia, Washington on the West Bay of Budd Inlet (Figure 1). Historically, the Site was used for milling purposes. The most recent commercial/industrial activity on the site was a lumber yard (Solid Wood, Incorporated) and closed in 2002. The site is currently vacant and a portion has been converted into West Bay Park. Historically railroad tracks run the entire length of the site (Parametrix 2008).

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SECTION 2 – FIELD SAMPLING PLAN

2.1 Sampling Design and Plan

Previous sediment characterization has included analytical sampling and bioassays performed on samples collected from seven distinct locations (see Figure 2). The results indicate that multiple sample locations have concentrations of TPH-HO/TPH-D that exceed Ecology's screening level of 100 milligrams per kilogram (mg/kg). One sample location (SD-33) also failed one of the three bioassays that were performed at this location (Parametrix 2011).

A focus area, based on sample locations with screening level exceedances and the bioassay that failed, was identified to determine proposed sample locations. The focus area includes SD-33 and is bounded to the north by SD-13, and to the south by SD-31. All of the samples to the north of SD-13 passed the bioassays, and SD-31 was below the Ecology-defined screening level of 100 mg/kg and passed the bioassays (Figure 2). Therefore, no additional characterization was considered outside of the focus area.

Twenty samples will be collected in the focus area from 13 sample locations north and west of previous sampling locations and east into the intertidal zone and near SD-33 (see Figures 3-5). Sediment samples will be collected from 0-10 centimeters (cm) bgs from all 20 locations. As required by Ecology, deep samples (i.e., 61-91 cm bgs) will be collected from some of the locations to assess the vertical extent of contamination. One of the seven deep sediment samples will be collected proximate to SD-33 (i.e., the location with the single bioassay failure). The six other deep samples will be collected from stations that are spatially distributed within the focus area.

2.2 Sampling Method

Sediment samples will be collected during low tide in order to ensure the proposed sample locations are exposed. Surficial sediment samples will be collected with a trowel and stainless steel bowl. Surficial sediment samples will be collected to a depth of 10 cm bgs with the trowel, and mixed in a stainless steel bowl prior to being placed in a sample jar. Deep sediment samples will be collected from 61-91 cm bgs using a hand auger. Sediment from the hand auger will also be mixed in a stainless steel bowl prior to being placed in a sample jar. The stainless steel bowl, trowel, and hand auger will be decontaminated between each sample using Alconox and deionized water.

Note: The approximate grain size will be identified in the field and recorded in field notes associated with each sampling location.

2.3 Sample Handling

All sediment samples will be placed in a cooler and held at approximately 4 degrees Celsius until they are received by OnSite Environmental Inc. in Redmond, Washington. Upon sample receipt, the laboratory will comply with the storage temperatures and maximum holding times required for the analyses to be performed (Table 1).

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SECTION 3 – LABORATORY ANALYSIS PLAN

3.1 Laboratory Analytical Methods

Sediment samples will be analyzed for TPH-D and TPH-HO using the NWTPH-Dx method (see Table 1).

3.2 Reporting and Detection Limits

Table 1 presents the practical quantitation limits (PQLs) and method detection limits (MDLs) used by the project laboratory. The project laboratory will report to the PQL, which does not exceed the screening level. If any sample's concentration is between the MDL and the PQL, the project laboratory will apply a J-flag to the result to qualify the result as an estimated concentration. Thus, the project laboratory is expected to be able to produce suitably sensitive analytical results.

3.3 Laboratory Quality Control

The project laboratory will be responsible for conducting laboratory quality control (QC) procedures and reporting laboratory QC results in accordance with laboratory standard operating procedures. The laboratory will perform and report the following laboratory QC once per batch of samples: method blank, blank spike, matrix spike, and matrix spike duplicate.

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SECTION 4 – DATA ANALYSIS AND REPORTING

The sediment sampling results will be documented in a report that will present the results of the field investigation in text, tables and figures. The purpose of the report will be to identify which areas of the Site are adequately characterized and those that may need additional evaluation. This determination will be achieved by comparing sampling results to the Ecology-defined screening level of 100 mg/kg for TPH-HO/TPH-D. Sample locations with TPH-HO/TPH-D concentrations that do not exceed the 100 mg/kg screening level will be identified as adequately characterized. Sample locations with TPH-HO/TPH-D concentrations that exceed the 100 mg/kg screening level will be evaluated on a case-by-case basis to determine if additional characterization is necessary to support the RI/FS. If additional characterization is necessary (e.g., collecting additional TPH-HO/TPH-D samples and/or collecting additional sediment samples for performing bioassays), then the City will submit another FSAP addendum to Ecology that documents the purpose, sampling locations, and methodology that will be used to collect (and interpret) the samples to further assess the extent of TPH-HO/TPH-D in sediment at the Site.

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SECTION 5 – REFERENCES

Parametrix. 2008. Work Plan for Remedial Investigation/Feasibility Study and Interim Action Solid Wood Incorporated Site (West Bay Park). Olympia, Washington. October.

Parametrix. 2010. Solid Wood Incorporated Site (West Bay Park) Interim Action Report. Olympia, Washington. September.

Parametrix. 2011a. Solid Wood Incorporated Site RI/FS and IA Work Plan Addendum No. 4--Supplemental Post Piling Removal Sediment Sampling and Analysis Plan. Olympia, Washington. March.

Parametrix. 2011b. Results of Supplemental Post Piling Removal Sediment Sampling. Olympia, Washington. August.

PSEP. 1995. Recommended guidelines for conducting laboratory bioassays on Puget Sound sediments. Interim Final Report. Puget Sound Estuary Program, U.S. Environmental Protection Agency Region 10, Seattle, Washington.

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Tables

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Table 1: Sample Storage Temperatures, Maximum Holding Times and Analytical Limits for Sediment Sample Analyses

Analysis	Method	Storage Temperature	Maximum Holding Time	PQL (mg/kg dry weight)	MDL (mg/kg dry weight)
TPH-D	NWTPH-DX	4˚C	14 days	25	8.36
TPH-HO	NWTPH-DX	4˚C	14 days	50	12.6

Notes:

NA: Not Applicable

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Figures

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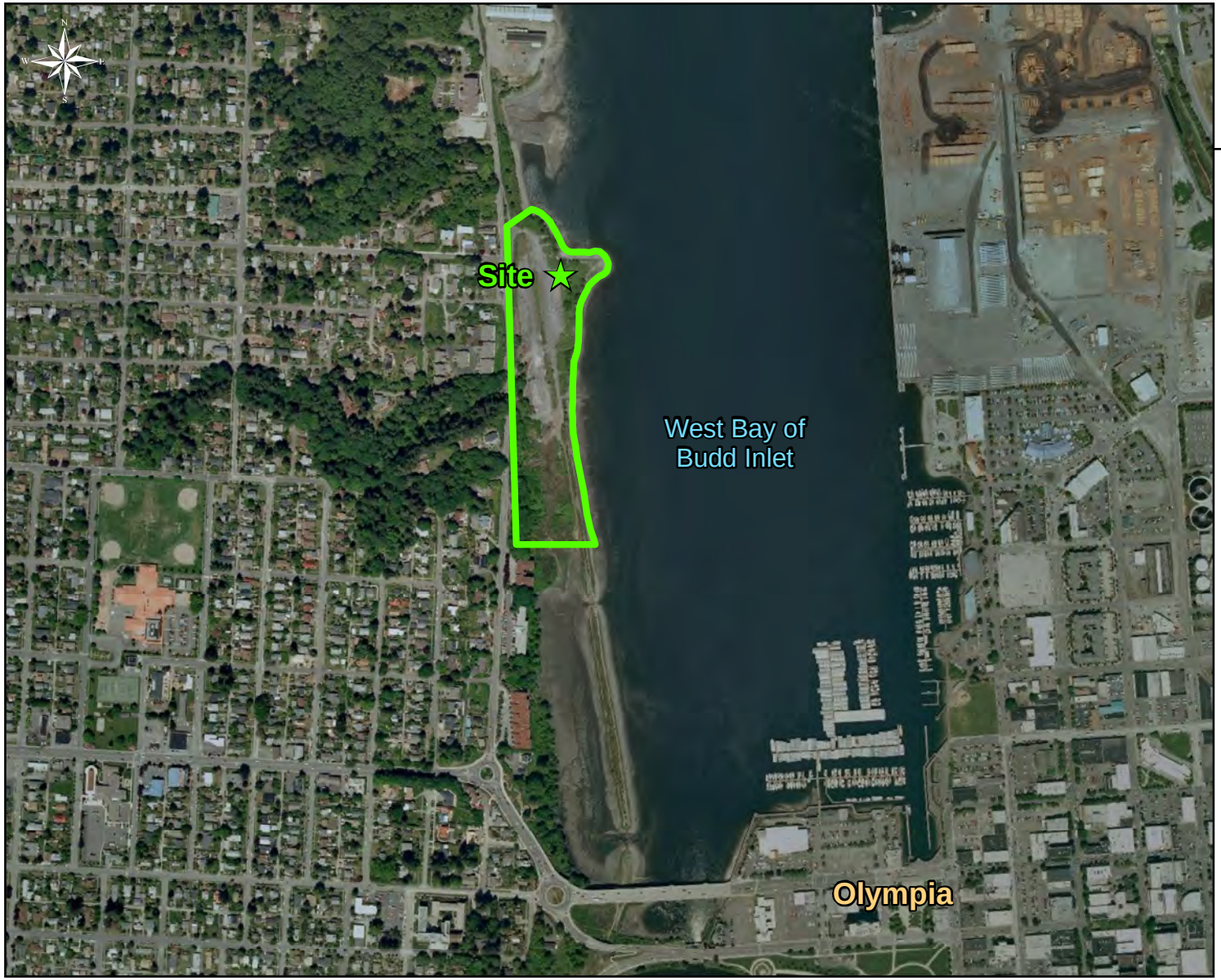

Legend

Agreed Order Boundary

Site

0 250 500 750 Feet

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Site Location
RI/FS and IA Work Plan Addendum No. 7
Olympia, Washington

Figure 1

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Focus Area

1 2 3 4

No test performed
Pass
Fail

Previous Sample Results

1. Total TPH Concentration (mg/kg)
   - Total TPH <= 100
   - Total TPH > 100
   - Non-Detect
2. 10-day amphipod solid phase survival test
3. Sediment larval test
4. 20-day polychaete solid phase survival and growth test

Notes:

- Total TPH is the total of TPH-D and TPH-HO.

0 25 50 75 Feet

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Previous Sediment Sample Results
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Olympia, Washington

Figure 2

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Focus Area

1 2 3 4

No test performed
Pass
Fail

Previous Sample Results

1. Total TPH Concentration (mg/kg)
   - Total TPH <= 100
   - Total TPH > 100
   - Non-Detect
2. 10-day amphipod solid phase survival test
3. Sediment larval test
4. 20-day polychaete solid phase survival and growth test

Proposed Sample Locations

- Surficial Sediment (0-0.5' bgs)
- Deep Sediment (2-3' bgs)

Notes:

- Total TPH is the total of TPH-D and TPH-HO.

0 25 50 75 Feet

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Proposed Sediment Sample Locations and Previous Total TPH and Bioassay Results
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Olympia, Washington

Figure 3

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Focus Area

1 2 3 4

No test performed
Pass
Fail

Previous Sample Results

1. TPH-HO Concentration (mg/kg)
   - TPH-HO <= 100
   - TPH-HO > 100
   - Non-Detect
2. 10-day amphipod solid phase survival test
3. Sediment larval test
4. 20-day polychaete solid phase survival and growth test

Proposed Sample Locations

- Surficial Sediment (0-0.5' bgs)
- Deep Sediment (2-3' bgs)

0 25 50 75 Feet

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Proposed Sediment Sample Locations and Previous TPH-HO and Bioassay Results
RI/FS and IA Work Plan Addendum No. 7
Olympia, Washington

Figure 4

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Focus Area

1 2 3 4

No test performed
Pass
Fail

Previous Sample Results

1. TPH-D Concentration (mg/kg)
   - TPH-D <= 100
   - TPH-D > 100
   - Non-Detect
2. 10-day amphipod solid phase survival test
3. Sediment larval test
4. 20-day polychaete solid phase survival and growth test

Proposed Sample Locations

- Surficial Sediment (0-0.5' bgs)
- Deep Sediment (2-3' bgs)

0 25 50 75 Feet

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Proposed Sediment Sample Locations and Previous TPH-D and Bioassay Results
RI/FS and IA Work Plan Addendum No. 7
Olympia, Washington

Figure 5