Final Materials Management Plan

City of Port Angeles CSO Construction Project
Port Angeles Rayonier Mill Site
Port Angeles, Washington

for
Rayonier Inc.

July 17, 2012

GeoEngineers
Earth Science + Technology

Final Materials Management Plan

City of Port Angeles CSO Construction Project
Port Angeles Rayonier Mill Site
Port Angeles, Washington

for
Rayonier Inc.

July 17, 2012

GeoEngineers

Plaza 600 Building
600 Stewart Street, Suite 1700
Seattle, Washington 98101
206.728.2674

ADDENDUM TO THE
FINAL MATERIALS MANAGEMENT PLAN

City of Port Angeles CSO Construction Project
Port Angeles Rayonier Mill Site
November 2012

This addendum provides clarification to the Final Materials Management Plan (MMP) dated July 17, 2012 based on:

- Ecology's review of public comments provided during the August 3 to September 5 public comment period.
- Subsequent communications between Rayonier and Ecology regarding the details of MMP implementation based on actual field conditions encountered.

Materials Management Plan

1. Section 1.5 Roles and Responsibilities. This section states that the City shall verify that all imported backfill material does not exceed applicable soil screening levels provided in the Public Review Draft *Interim Action Report Volume I: Upland Data Summary Report for the Study Area*.

   To clarify…
   On October 29, 2012, Rayonier, on behalf of the City, requested Ecology's approval to allow the City's contractor to use imported fill from the Holcomb Pit/Black Diamond Quarry, approximately 3.5 miles southwest of Port Angeles. The City provided Rayonier with sampling results for the fill material and Rayonier evaluated the results relative to Ecology's natural background soil metals study and site groundwater. The sampling results indicated that the fill material contains copper at concentrations greater than the applicable screening level (50 parts per million), but within the range of naturally-occurring background concentrations in Western Washington. Ecology agreed that the fill material does not exceed the applicable soil screening levels, except for copper. Ecology further agreed that the copper is within the range of natural background concentrations and is not likely to leach to site groundwater at concentrations of concern in the trench location. Based on their review, Ecology agreed that the Holcomb Pit/Black Diamond Quarry source for imported fill is acceptable for this construction project.

2. Section 4.2.1 Vertical and Lateral Limits of Overexcavation. This section notes that measures must be taken to reduce the potential for recontamination of clean backfill material in the areas of overexcavation for visibly contaminated soil. This may include the use of an impermeable barrier such as a polymer geomembrane or a bentonite mat placed at the overexcavation limits between clean backfill and the soil left in place.

   The City's specifications state "In areas where contaminated soil is to remain following contaminated soil over excavation install woven filter fabric to separate clean backfill from contaminated soils. Install woven filter fabric so as to extend a minimum of 5-feet beyond the limits of contaminated soil to remain."

   To clarify…
   In general, a woven filter fabric will not be acceptable as it is anticipated that the most likely visibly contaminated soil will be petroleum contaminated soil and a woven filter fabric will not be sufficient

to reduce recontamination of clean backfill material. Scrim-reinforced visqueen/plastic sheeting is an acceptable barrier.

3. Section 5.0 Materials Management Requirements. Section 5 did not provide specific handling requirements for other materials that might be generated during stockpile staging area preparation.

   To clarify…
   Rayonier will manage the following materials using the methods described below while completing construction of the CSO soil staging areas. These materials refer to preexisting materials encountered below or in the vicinity of the soil staging areas:
   - Concrete rubble/soil – may be moved around within staging areas.
   - Asphalt debris - avoid excavating if possible. If removed, place in debris stockpile area #3, cover, and take off-site for proper disposal/recycling along with other asphalt removed from the CSO pipe trench.
   - Rebar/metal debris - temporarily stage to the side of the stockpile areas, remove for disposal/recycling depending on quantities/quality.
   - Visibly contaminated soil – avoid if possible. If limited quantities/extent and must be removed, excavate and place in roll-off bin for proper off-site disposal/recycling.
   - Creosoted pilings - avoid if possible. If removed, place in debris stockpile area #3, cover, and take off-site for proper disposal/recycling along with other creosoted pilings removed as part of the CSO project.

4. Section 5.2.3 Material Handling/Stockpile Management Procedures and Section 5.3 – Post Construction Stockpile Management/Maintenance. These sections provide only limited information on the inspection and maintenance of the stockpiles during and post construction.

   To clarify…
   During CSO construction – stockpiles will be inspected daily while trenching and placement of excavated soils in the staging areas is occurring. Otherwise, inspections will be conducted at a minimum weekly, and following significant storm events. The purpose of the inspections is to ensure BMPs (plastic liners/covers, silt fencing, etc.) are in proper working order. The stockpiles will be visually inspected to make sure the plastic covers and silt fences are in place, and that no signs of erosion by or ponding of water are present. A summary of the inspection and corrective actions taken with photo log of the stockpiles will be maintained by Rayonier and provided to Ecology monthly.

   Post construction – because stockpiles may be in place for a period of years, a semi-permanent cover will be used. For example, the stockpiles may be covered with up to 1 foot of clean soil and sod. Rayonier will submit a design proposal for Ecology review and approval 60 calendar days after Rayonier places all soils in the stockpile area. The design proposal will include inspection frequency and criteria, and maintenance requirements.

5. Section 5.2.3 Material Handling/Stockpile Management Procedures and Section 5.2.3.1 Type 1 and Type 2 Soil. These sections describe how Type 1 and Type 2 soils will be managed in the stockpile areas. In particular, the text states that in unpaved portions of the stockpile areas, a compacted fill pad consisting of clean soil will be constructed (either known Type 1 soil or imported clean fill). The text also states that Type 1 and Type 2 soil will be placed on a plastic liner, and that individual soil stockpiles will contain no more than approximately 2,000 cubic yards of excavated soil and will be roughly 8 feet or less in height.

To clarify…
A compacted fill pad of clean soil will not be used. Instead, concrete rubble (where present) will be graded and compacted. Imported fill will be used as necessary to fill significant void spaces in the concrete rubble. The purpose of the bottom plastic liner is to provide a visual/physical barrier in unpaved portions of the stockpile areas. A geotextile fabric meets this purpose and will be used instead. Some soil stockpiles may need to be larger than specified in the MMP to accommodate excavated soil volumes.

6. Section 5.2.3.2 Type 3 Soil. This section notes that if Type 3 soil is encountered, the City will segregate and place Type 3 soil in roll-off containers provided by Rayonier.

   To clarify…
   In the event there is more Type 3 soil than capacity in the roll-off bins, Rayonier will designate Stockpile Bin #1-1 (see attached figure) as a "Temporary Type 3 Soil Emergency Overflow Staging Area." This area will only be used in the unlikely event that a significant amount of Type 3 soil is encountered during excavation of the CSO pipeline trenches that cannot be managed using the two roll-off containers on-site. If Bin #1-1 is needed for this purpose, it will be lined with plastic sheeting on top of the geotextile fabric and any Type 3 soil staged there will be subsequently transferred by Rayonier to roll-off containers, or direct-loaded into trucks for off-site disposal, depending on quantities.

7. Section 5.2.3.3 Concrete, Wood, and Other Debris. This section describes how construction debris removed from the CSO excavations will be segregated and managed in the stockpile areas.

   To clarify…
   Any significant quantities of concrete, wood, and other debris encountered during CSO excavation activities by the City will be segregated by the City and stockpiled by the City in Area 3. The debris will be placed on a geotextile fabric provided by Rayonier and covered with plastic sheeting by Rayonier, if needed based on observed staining or product on the debris. In the meantime, Rayonier agreed to allow the City to use Stockpile Area 3 for temporary staging of surface debris until/unless such time as Stockpile Area 3 is needed to accept concrete, wood, and other construction debris removed from the CSO excavations. Disposal of these materials is the City's responsibility.

8. Section 5.2.4 Handling of Sediment Removed from Deepwater Outfall Diffuser. This section notes that dewatered sediment will be placed in a stockpile with other Type 1 soil.

   To clarify…
   The dewatered sediment will be stockpiled separately from Type 1 soil, but in the area designated for Type 1 soil.

9. Section 5.5 Groundwater and Stormwater Management and Disposal. This section describes the management of stormwater in the stockpile staging areas.

   To clarify…
   Rayonier is responsible for the management of stormwater runoff from the soil stockpile areas. Stormwater is managed by using Best Management Practices (BMPs). The BMPs for stockpile construction and maintenance are designed to prevent soil erosion and contact of

rainwater/stormwater with the stockpiles. Rayonier does not expect there to be any runoff from the covered stockpiles beyond the limits of the stockpile areas.

10. Section 10.0 Submittal Schedule. This section identifies documents Rayonier is to submit for Ecology review and/or approval.

    To clarify…
    Two new submittals are required.

    - Stockpile inspection summaries and photo logs are to be submitted monthly for Ecology review.
    - Post Construction Stockpile Cover Design is to be submitted to Ecology for review and approval 60 calendar days after completion of the construction of the stockpiles.

11. Appendix C, Figure 3 Proposed Product Staging/Storage Area. Figure 3 in Appendix C of the MMP shows the original-planned layout of the stockpile areas; the figure attached to this addendum shows the as-built layout. As shown on the as-built, Stockpile Area 1 was constructed with two infiltration areas: one north of the access road and one to the south.

    To clarify…
    Throughout the CSO construction project to date, the stormwater conveyance/infiltration capacities of the drainage channels and the northern infiltration area in Stockpile Area 1 have proven to be more than adequate to accommodate runoff from the covered soil stockpiles. Even during heavy rainfall events, most of the runoff from the covered stockpiles infiltrates the drainage channels. No runoff has been observed flowing into the southern infiltration area. Consequently, if additional storage capacity is needed for soil excavated during the CSO project, the southern infiltration area of Stockpile Area 1 will be converted to a stockpile storage bin (Bin #1-9), and the drainage channels will be modified as necessary to direct runoff to the northern infiltration area.

12. With Ecology's concurrence, Rayonier emptied 34 drums containing soil cuttings (investigation-derived waste) from Rayonier's 2010-2011 supplemental upland investigation and the City's 2011 Phase II environmental site assessment of the City Purchase Area in Stockpile Bin #2-2. The soil was stockpiled with Type 2A soil.

Effective date of this Addendum: 3 December 2012

Rayonier Properties LLC

Warren Snyder

Warren Snyder, PE
Senior Manager
Environmental Engineering

State of Washington Department of Ecology

Marian L. Abbett

Marian L. Abbett, PE
Project Manager
Toxics Cleanup Program, SW Regional Office

N

MHHW

~200' SHORELINE SETBACK

COLLECTION/ INFILTRATION/ CONVEYANCE TRENCH (TYP)

SOIL STOCKPILE AREA (~2,000 CY)

STOCKPILE AREA 1

PHYSICAL BARRIER (EARTHEN BERM, FENCING, ETC.) (TYP)

BIN #1-5

BIN #1-6

BIN #1-7

BIN #1-8

BIN #1-1

BIN #1-2

BIN #1-3

BIN #1-4

TRAFFIC FLOW

MEAN HIGHER HIGH WATER

EDGE OF SHORELINE

ACCESS ROAD

~100' STREAM SETBACK

~100' STREAM SETBACK

APPROXIMATE CSO CONSTRUCTION LIMITS BY OTHERS (TYP)

INFILTRATION AREA

EXISTING SITE ENTRANCE

ACCESS ROAD

INFILTRATION AREA

SOIL STOCKPILE AREA

COLLECTION/INFILTRATION/ CONVEYANCE TRENCH (TYP)

COLLECTION/ INFILTRATION/ CONVEYANCE TRENCH (TYP)

CONVEYANCE CULVERT UNDER ACCESS ROAD

STOCKPILE AREA 2

IF NEEDED BIN #2-0

BIN #2-1

BIN #2-2

BIN #2-3

BIN #2-4

STOCKPILE AREA 3

BIN #3-1

BIN #3-2

ACCESS ROAD

INFILTRATION AREA

TRAFFIC FLOW

~200' SHORELINE SETBACK

ENNIS STREET AND FORMER RAYONIER ACCESS ROAD

CREOSOTE TIMBER STOCKPILE AREA (~5,700 SF)

EXISTING WELL HEAD TO BE PROTECTED

CONVEYANCE CULVERT UNDER ACCESS ROAD

ASPHALT AND OTHER ROADWAY MATERIALS STOCKPILE AREAS (~9,300 SF)

PHYSICAL BARRIER (EARTHEN BERM, FENCING, ETC.) (TYP)

PHYSICAL BARRIER (EARTHEN BERM, FENCING, ETC.) (TYP)

Notes

1. Infiltration areas will be sized based on actual soils/materials, topography, and observed infiltration conditions.
2. Collection/infiltration/conveyance trenches will be at least triangular with 2:1 side slopes and 2 feet deep.
3. The conveyance culverts under access roads will be at least 12" diameter culverts.
4. Access roads will be existing impervious pavement, recycled concrete rubble (without rebar and metal debris), and or quarry spalls. Actual tie-in locations to existing roads will be determined in the field.
5. Stockpile areas will be built up per the attached stockpile detail sketch.
6. Visually contaminated soils will be placed directly into roll-off containers. These mobile containers will have secondary containment around them during filling.
7. Bin No. 2-0 will be created and used only when the other bins in Stockpile Area 2 are full.
8. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

DRAFT

Legend

- CSO Construction Limits
- Stream and Shoreline Setback
- MHHW — Mean Higher High Water (Rayonier, 2012)
- Drainage Channel and Flow Direction
- Proposed Access Road

0 200 400

Scale in Feet

Base map source: Google Earth

LANDAU ASSOCIATES

Rayonier Properties Inc. Former Mill Site Port Angeles, Washington	**Non-Surveyed As-Built Conditions Product Staging / Storage Areas**	Figure 3

Final Materials Management Plan

City of Port Angeles CSO Construction Project
Port Angeles Rayonier Mill Site
Port Angeles, Washington

File No. 0137-015-03

July 17, 2012

Prepared for:

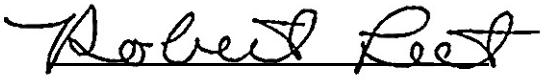
Rayonier Inc.
50 N. Laura Street, Suite 1900
Jacksonville, Florida 32202

Attention: Warren Snyder, P.E.

Prepared by:

GeoEngineers, Inc.
Plaza 600 Building
600 Stewart Street, Suite 1700
Seattle, Washington
206.728.2674

Kurt S. Anderson, LG, LHG
Senior Principal



Robert C. Leet, PhD, LG
Project Manager

KSA:RCL:csv

GeoEngineers

Table of Contents

LIST OF TABLES

LIST OF FIGURES

APPENDICES

1.0 INTRODUCTION

1.1. Background

This Materials Management Plan (MMP) has been prepared on behalf of Rayonier Inc. (Rayonier) for the Combined Sewer Overflow (CSO) Project to be constructed by the City of Port Angeles (City) on a portion of the former Rayonier Mill property ("the mill property") in Port Angeles, Washington. The results of environmental investigations conducted at the mill property have identified dioxins, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), total petroleum hydrocarbons (TPH), polychlorinated biphenyls (PCBs), metals, and ammonia (collectively referred to herein as constituents of potential concern [COPCs]) in soil and/or groundwater at concentrations exceeding regulatory screening levels. The CSO Project will include excavation of soil that is likely to contain one or more of these COPCs. Groundwater containing COPCs may also be encountered during the CSO Project construction.

This MMP describes the planned interim action to ensure contamination along the CSO alignment has been addressed in compliance with the Model Toxics Control Act (MTCA), as required by the Washington Department of Ecology (Ecology). The interim action will facilitate the construction of the CSO Project and expedite remediation in and around the project area. This MMP also describes basic requirements for the management of potentially contaminated soil and/or groundwater generated during the CSO Project, as well as concrete, wood, or other construction debris that may be encountered. If site-specific remediation levels for soil and/or groundwater are established for the Rayonier property prior to the start of CSO soil excavation activities, then the MMP may need to be modified or amended.

1.2. Purpose and Scope of the Plan

The primary purpose of this MMP is to describe the planned interim action to address contamination along the CSO alignment in compliance with MTCA. The MMP:

- Summarizes the existing data and information within and along the CSO Project alignment and identifies areas of potentially contaminated soil and groundwater that may be encountered during construction of the CSO Project.
- Describes the planned interim action and how it ties in with the CSO Project.
- Describes plans for overexcavating and managing visibly contaminated soil, if encountered during the CSO Project.
- Summarizes requirements for managing soil and any groundwater or debris generated during the CSO Project in a manner that will minimize contact with stormwater.

In addition to describing the management of soil, groundwater, and/or debris generated during the upland CSO excavation activities, this MMP also describes plans for managing a small quantity of marine sediment to be generated during the City's rehabilitation of the diffuser section of the former Rayonier Mill deepwater industrial wastewater outfall in Port Angeles Harbor. For the purposes of the MMP, the term "contaminated" refers to soil, dewatered sediment, or groundwater containing concentrations of one or more COPCs exceeding numeric screening levels for soil and

groundwater that have been discussed and agreed upon by Rayonier and Ecology. The applicable screening levels are presented in the Public Review Draft *Interim Action Report Volume I: Upland Data Summary Report for the Study Area* (GeoEngineers, 2012a).

1.3. Regulatory Framework

Washington's MTCA defines procedures to identify, investigate, and clean up facilities where hazardous substances have come to be located. In March 2012, Ecology and Rayonier reached agreement on the guiding principles, assumptions, and agreements for an interim action to be performed in conjunction with the CSO Project. In summary, Rayonier and Ecology agreed that as part of the CSO Project, an interim action should be taken to ensure that contamination that may exist along the CSO alignment has been addressed for all three pathways of concern (i.e., human health direct contact, ecological, and protection of groundwater). It was further agreed that but for the CSO Project, an interim action would not be required along the CSO alignment per MTCA prior to the selection of an interim action for the Study Area under Agreed Order 6815.

The interim action to address contamination along the CSO alignment is being conducted in accordance with MTCA requirements summarized in Chapter 173-340-430 of the Washington Administrative Code (WAC). Specific elements of WAC 173-340-430 that apply to this action are summarized below:

- The interim action meets the definition included in WAC 173-340-430(1)(a) and (1)(b): *An interim action is a remedial action that is technically necessary to reduce a threat to human health or the environment by eliminating or substantially reducing one or more pathways for exposure to a hazardous substance at a facility. And an interim action is a remedial action that corrects a problem that may become substantially worse or cost substantially more to address if the remedial action is delayed.*
- The relationship of the interim action to the final cleanup action meets requirement WAC 173-340-430(3)(b): *If the cleanup action is not known, the interim action shall not foreclose reasonable alternatives for the cleanup action. This is not meant to preclude the destruction or removal of hazardous substances.*

As required by WAC 173-340-430(6), public participation activities will be completed by Ecology prior to implementing the interim action.

1.4. CSO Project Description

The City's CSO Project aims to reduce CSO discharges to Port Angeles Harbor. The project will connect existing City infrastructure to the City's wastewater treatment facility, and includes installation of new underground piping and structures. The project also will utilize existing piping (Shannon & Wilson, 2010; City, 2010). The proposed CSO alignment and locations of associated structures are shown on Figure 1.

The document *Draft Geotechnical Report, City of Port Angeles – Francis Street Combined Sewer Overflow Diversion Project* (Shannon & Wilson, 2010) indicates that groundwater along the CSO alignment on the mill property occurs at depths of approximately 0 to 8 feet below ground surface (bgs); boring logs contained in the same report indicate that groundwater occurs at depths of

approximately 2 feet bgs (location PA-19) to 9 feet bgs. Excavation dewatering will be performed by the City and its contractors as necessary (Shannon & Wilson, 2010). Possible dewatering methods include sumps and pumps, well points, and/or deep dewatering wells.

The CSO Project excavations will be either open-cut with temporary excavation slopes or supported by shallow shoring. For deeper excavations, excavations where existing facilities are nearby, or areas where limited disturbance is required, some form of temporary shoring may be used. Deeper excavations are planned for construction of the effluent diversion structure, storage tank stair tower, and gravity outfall. Shoring methods may include trench boxes, cantilevered or braced soldier piles, and lagging walls or slide rail shoring systems.

The CSO Project excavations will be backfilled with clean imported fill; excavated soil will not be reused to backfill the excavations (Shannon & Wilson, 2010).

As part of the City's planned rehabilitation of the diffuser section of the mill's former deepwater outfall (Outfall 001), the City anticipates that an estimated 10 to 50 cubic yards (CY) of accumulated marine sediment will be removed from the diffuser. Rayonier assumes that the City will dewater this sediment, and that the dewatered sediment will then be added to the soil stockpiles constructed during the upland CSO excavation activities.

1.5. Roles and Responsibilities

The City will generally be responsible for construction of the CSO Project and initial materials handling, and Rayonier will generally be responsible for oversight of contaminated soil excavation and handling of materials once delivered by the City to Rayonier. Rayonier is not responsible for the City's obligations under, or compliance with, this MMP, and the City is not responsible for Rayonier's obligations under, or compliance with, this MMP. Descriptions of construction and interim action activities are provided in subsequent sections of this MMP. Specific responsibilities for these activities are as follows:

- The City shall complete all excavation and segregation of soil and deliver soil to stockpile areas designated by Rayonier.
- The City shall decontaminate all equipment used to transport contaminated soil and groundwater.
- Rayonier shall observe soil excavation and direct the delivery of soil to designated stockpile areas.
- The City shall complete all excavation, overexcavation, and segregation of visibly contaminated soil, and deliver visibly contaminated soil to roll-off containers designated by Rayonier.
- Rayonier shall observe, field screen, and direct the excavation and overexcavation of visibly contaminated soil, and direct the delivery of visibly contaminated soil to designated roll-off containers.
- Rayonier shall provide roll-off containers for secure containment of visibly contaminated soil.

- The City shall complete all excavation and segregation of concrete, wood, and other debris, and deliver these materials to stockpile areas designated by Rayonier.
- Rayonier shall observe the excavation of concrete, wood, and other debris, and direct the delivery of these materials to designated stockpile areas.
- Rayonier shall sample soil at the limits of excavation in areas where visibly contaminated soil is overexcavated.
- The City shall backfill and compact all overexcavated areas. The City shall verify that all imported backfill material does not exceed applicable soil screening levels provided in the Public Review Draft *Interim Action Report Volume I: Upland Data Summary Report for the Study Area* (GeoEngineers, 2012a).
- The City shall dewater sediment removed from the deepwater outfall diffuser section prior to delivering it to Rayonier at the stockpile location designated by Rayonier.
- Rayonier shall characterize the deepwater outfall sediment stockpile to determine proper handling.
- Rayonier shall manage and maintain stockpiled materials once the City delivers material to the stockpile areas.
- Rayonier shall sample visibly contaminated soil and soil being considered for reuse on site.
- The City shall conduct any dewatering necessary during excavation or overexcavation and arrange for any treatment and disposal of dewatering water.
- Rayonier shall arrange for storage, treatment, and disposal of dewatering water if the water is not acceptable for disposal at the City's wastewater treatment plant.
- Rayonier and its contractors shall be responsible for preparing their own Health and Safety Plan (HASP).
- The City and its contractors shall be responsible for preparing their own HASP.
- The City shall be responsible for obtaining all permits required to complete the CSO Project.
- Rayonier shall be responsible for obtaining permits and approvals for the interim action, or for complying with the substantive requirements of any permits or approvals covered by the procedural exemption of the Revised Code of Washington (RCW) 70.105D.090.(1).
- The City shall be responsible for archaeological monitoring, notifications, and permits.
- Rayonier shall arrange and pay for transportation and disposal of visibly contaminated soil and separate-phase hydrocarbons, if encountered.
- Rayonier shall be considered the generator of all contaminated soil and groundwater generated during the construction project, and will be presented with waste authorization forms and bills of lading for signature.

2.0 EXISTING CONDITIONS

2.1. Historical Activities

Until the mill was dismantled in 1997, it operated as a dissolving sulfite pulp mill that produced acetate, specialty paper, fluff, and viscose-grade pulps for industrial use.

The mill's pulp-making process involved several industrial chemicals. In the early years, the mill discharged untreated liquid wastes and byproducts (spent sulfite liquor) into Port Angeles Harbor. During the 1970s, primary and secondary wastewater treatment systems were constructed at the mill, and the mill subsequently treated its wastewater before discharging the treated effluent through a deep-water outfall more than a mile offshore in the Strait of Juan de Fuca. The mill added separated sludges from the wastewater treatment systems to wood chips (hog fuel) and burned this mixture in the mill's boilers.

As a result of the former mill operations, soil and groundwater at the mill property have been impacted by hazardous substances, as defined by MTCA. Previous sampling and analyses performed to characterize the nature and extent of contamination on the mill property are described in the Public Review Draft *Interim Action Report Volume I: Upland Data Summary Report for the Study Area* (GeoEngineers, 2012a).

2.2. Soil Conditions Along CSO Alignment

Existing analytical data from previous soil sampling conducted within and proximal to the CSO alignment were used to classify soil along the alignment according to anticipated contamination levels. This classification will facilitate segregation of the soil into appropriate stockpiles during CSO Project construction. The evaluation of the existing soil analytical data is presented in the technical memorandum *Classification of Soil along the City of Port Angeles Combined Sewer Overflow (CSO) Pipeline Alignment* (GeoEngineers, 2012b), contained in Appendix A. The resulting soil classifications within the CSO alignment are shown in Figure 1.

For the purposes of this MMP, "uncontaminated" soil is designated as Type 1 soil; this refers to soil that is suitable for unrestricted reuse on the mill property because COPC concentrations in the soil are less than applicable screening levels protective of human health (direct-contact), terrestrial ecological exposures, and groundwater as marine surface water. Type 2 soil refers to contaminated soil that does not contain visible contamination, but may not be suitable for unrestricted reuse on the mill property because COPC concentrations in the soil may exceed future cleanup levels to be established for the Study Area interim action. Type 3 soil refers to visibly contaminated soil (i.e., soil containing visible staining/discoloration, separate-phase hydrocarbons, thick boiler ash deposits, etc.). Soil will be segregated during excavation activities as described in Sections 4.1 and 5.2.

2.3. Sediment Conditions in Deepwater Outfall Diffuser

Existing analytical data from previous sampling of marine surface sediments in the vicinity of the 1,000-foot-long diffuser section of the former Rayonier Mill deepwater outfall (Outfall 001) were reviewed to classify the sediment that will be removed from the outfall during the City's rehabilitation of the diffuser. The sediment data for this area are contained in Appendix B. Rayonier assumes that the City will dewater the removed sediment prior to delivering it to Rayonier

for stockpiling on the upland mill property. Upon dewatering, the sediment will be physically similar to soil and will be managed as soil. Accordingly, the existing sediment data were compared to the soil screening levels presented in the Public Review Draft *Interim Action Report Volume I: Upland Data Summary Report for the Study Area* (GeoEngineers, 2012a). The results of the sediment data review indicate that the dewatered sediment will likely meet the requirements of Type 1 (i.e., uncontaminated) soil.

3.0 INTERIM ACTION AND PROTECTION OF POTENTIAL RECEPTORS

Since contaminated soil will likely be encountered during the CSO construction project, Ecology has concluded that an interim action is necessary to address the contamination in order to reduce the potential threat to human health or the environment. Ecology has also concluded that delaying the remedial action could result in a substantially more costly cleanup with the presence of the CSO pipelines.

Taking advantage of the opportunity presented by the CSO construction project, the interim action will consist of the following primary components:

- The soil excavation necessary for the CSO Project.
- Overexcavation of Type 3 (visibly contaminated) soil if encountered during CSO construction, and off-site disposal of Type 3 soil.
- Stockpiling Type 2 soil with appropriate long-term management until an interim action is selected for the Study Area.
- Backfilling the excavations with clean soil.
- Collection and appropriate treatment/disposal of excavation water and construction stormwater.

The interim action to be completed in conjunction with the CSO Project will ensure the long-term protection of the exposure pathways and receptors of concern within the CSO Project area. Excavation and removal of contaminated soil during CSO Project construction will be conducted in a manner that does not preclude future cleanup actions along the CSO alignment. Section 4.2 provides details regarding overexcavation of Type 3 soil.

3.1. Protection of Human Health and Terrestrial Ecological Receptors

The construction of the CSO (i.e., trench excavation) partially addresses contamination along the alignment for two of the three exposure pathways of concern: human health and terrestrial ecological receptors. Following the completion of the CSO Project, there will be approximately 6 feet of clean backfill over the pipelines for a width of about 18 to 29 feet, depending on location. This clean cap reduces the potential for direct contact to any contaminated soil that may remain beneath the pipelines by terrestrial ecological receptors, as the typical conditional point of compliance for ecological receptors is 6 feet bgs. The presence of the clean backfill and the use of environmental covenants will reduce the potential for direct contact by humans and terrestrial ecological receptors to any contaminated soil that may be left in place beneath the pipelines.

Figure 2 depicts how the CSO excavation and backfilling activities address these two pathways of concern.

Contaminated soil outside the limits of the CSO trench will be remediated in the future as part of the interim action for the Study Area. If the interim action for the Study Area consists of excavation, then special shoring along the trench may be necessary to protect the CSO pipeline, or a lateral setback of 1.5H to 1V may be required to protect the integrity of the pipeline. If a setback is used, then there may be a wedge of soil contamination immediately adjacent to the trench that will not be able to be excavated. Ecology may determine as part of a later interim action plan or final cleanup action plan that additional actions under MTCA, such as environmental covenants, may be required to protect human health and the environment for any remaining contamination that may be left in place.

3.2. Protection of Groundwater and Surface Water

Based on a review of existing chemistry analytical data and field observations from subsurface explorations completed in the upland portion of the Study Area, Ecology has determined that there are no soil sources along the CSO alignment that need to be overexcavated during CSO Project construction to protect groundwater or surface water. The information reviewed by Ecology included data from monitoring wells PA-24, MW-52, MW-69, and MW-70, all of which are immediately downgradient of the CSO alignment and within 200 feet of Port Angeles Harbor or Ennis Creek. Ecology also reviewed field observations from explorations completed by the City in July 2011 to screen for the presence of cultural resources along the CSO alignment. The City excavated a series of test pits along the CSO alignment west and east of Ennis Creek, and a Rayonier representative was present to monitor the excavations for visual evidence of contamination. The only evidence of potential contamination encountered consisted of thin (2 to 4 inches thick) horizons of fine-grained, light gray material, interpreted as possible boiler ash, which were observed within the upper 0.75 to 1.5 feet of the ground surface in two test pits. These thin layers of apparent ash appeared to be limited in lateral extent, and thus represent *de minimis* quantities that do not warrant overexcavation.

4.0 EXCAVATION APPROACH

This section describes the general approach for excavation of materials during CSO Project construction. Rayonier or Rayonier's representatives will observe excavation activities for conformance with this MMP and for the presence of any unexpected conditions. The representative will be supervised by a licensed engineer, geologist or hydrogeologist.

4.1. Material Classification and General Excavation Approach

For the purpose of this MMP, material to be excavated by the City during CSO Project construction can be divided into four categories:

- Type 1 soil (soil containing COPC concentrations below applicable screening levels).
- Type 2 soil (soil containing COPC concentrations above applicable screening levels).
- Type 3 soil (visibly contaminated soil).

- Concrete, wood, and other debris.

The general approach to handling these four categories of excavated materials during construction is described below.

4.1.1. Type 1 Soil (Soil Not Exceeding Screening Levels)

All soil excavated by the City for pipeline construction that is not visibly contaminated (i.e., all soil not classified as Type 3 soil) will initially be assumed to be Type 2 soil, unless and until future stockpile sampling indicates otherwise. However, a review of existing soil data within and proximal to the CSO alignment (GeoEngineers, 2012b) indicates that there are three intervals along the alignment where COPC concentrations may not exceed screening levels, and thus the soil excavated from these intervals may qualify as Type 1 soil appropriate for unrestricted reuse on site. These intervals are labeled "Type 1" in Figure 1. Although Rayonier will manage the soil from these intervals as if it is Type 2 soil (i.e., using the same best management practices [BMPs] to protect against direct contact and erosion), the City will segregate and stockpile this soil separate from the other types of excavated material during construction. The segregation and handling of excavated materials is discussed further in Section 5.2.

4.1.2. Type 2 Soil (Soil Exceeding Screening Levels)

The majority of soil along the CSO alignment is inferred to be Type 2 soil based on the existing data. Type 2 soil can be further classified as Type 2A, defined as soil with COPC concentrations that exceed screening levels by a factor of less than ten, and Type 2B, defined as soil with COPC concentrations that exceed screening levels by a factor of ten or greater. The anticipated locations of these two subcategories of Type 2 soil along the CSO alignment (as inferred from existing soil analytical data) are shown in Figure 1. The City will segregate and stockpile material designated as Type 2A soil and Type 2B soil separately during construction. The segregation and handling of excavated materials is discussed further in Section 5.2. The BMPs that will be used to protect against direct contact and erosion of stockpiled materials are discussed in Sections 5.2 and 5.3.

4.1.3. Type 3 Soil (Visibly Contaminated Soil)

No visibly contaminated (Type 3) soil is known to exist along the CSO alignment. However, based on existing data and previous interim actions, the two areas along the CSO alignment where Type 3 soil is most likely to be encountered are the Fuel Oil Tanks 1 and 2 Area and the Equipment Storage Area (Figure 1).

During CSO construction, Rayonier or Rayonier's representatives will monitor excavations conducted by the City for visual evidence of contamination such as:

- Separate-phase liquid hydrocarbons.
- Thick (greater than 6 inches) boiler ash deposits.
- "Heavy" soil staining/discoloration.
- Hydrocarbon sheen (based on sheen pan testing).

Field screening will be performed by Rayonier during excavation activities to delineate areas of visibly contaminated soil. The field screening methods will include visual observation, sheen pan testing, and headspace organic vapor screening. The specific procedures for field screening are described in Appendix A of the *Supplemental Upland Data Collection Work Plan* (Work Plan; GeoEngineers, 2010). Any Type 3 soil encountered will be transferred by the City directly to roll-off containers provided by Rayonier to physically isolate this material from other excavated materials and prevent erosion and possible direct contact with the material. The segregation and handling of excavated materials is discussed further in Section 5.2.

4.1.4. Concrete, Wood, and Other Debris

Any significant quantities of concrete, wood, and other construction debris such as scrap metal encountered during excavation activities by the City will be segregated by the City and stockpiled by the City in areas designated by Rayonier that are separate from the other categories of excavated material. The segregation and handling of excavated materials is discussed further in Section 5.2.

4.2. Overexcavation of Visibly Contaminated (Type 3) Soil

Following the completion of the CSO Project, the presence of underground piping will restrict access to soil adjacent to or beneath the CSO alignment. Therefore, visibly contaminated (Type 3) soil adjacent to or beneath the CSO alignment, if encountered during CSO Project construction, will be overexcavated by the City to ensure the long-term protection of the transport and exposure pathways of concern. The overexcavation of Type 3 soil by the City will begin where soil contamination is observed in the CSO excavations and extend parallel to the CSO alignment until soil shows no visible signs of contamination. The overexcavation by the City will extend vertically and laterally away from the alignment as described in Section 4.2.1. Rayonier will observe, field screen, and direct the overexcavation of Type 3 soil, and direct the delivery of the soil to designated roll-off containers. The City's overexcavation of Type 3 soil will be conducted in a manner that does not preclude future cleanup actions along the CSO alignment. If cultural artifacts are discovered during overexcavation, the parties will follow the cultural resource protocols outlined in Section 8.0.

4.2.1. Vertical and Lateral Limits of Overexcavation

The vertical and lateral limits of overexcavation for Type 3 soil are shown schematically in Figure 2.

The vertical limit of overexcavation will generally be 2 feet below the depth of the water table if groundwater is encountered during the excavation activities. If groundwater is not encountered during excavation, the vertical limit of overexcavation will generally be 15 feet bgs. However, if visible contamination does not extend as deep as these maximum limits, overexcavation of Type 3 soil by the City will be completed to the vertical limit of visible contamination.

Lateral overexcavation of Type 3 soil by the City will not extend beyond the area of potential effects (APE) for cultural or historic artifacts or a setback distance of 6 feet from the edge of the pipeline trench, whichever is less (Figure 2). The City has indicated that 6 feet is the minimum acceptable setback required to protect the structural integrity of the pipeline should future excavation become necessary adjacent to the pipeline. If the distance to the lateral limit of visible contamination is less than either the distance to the edge of the APE or 6 feet from the edge of the pipeline trench,

overexcavation of Type 3 soil by the City will be completed to the lateral limit of visible contamination.

In areas where Type 3 soil is left in place outside of the maximum lateral overexcavation limits specified above, measures will be taken by the City to reduce the potential for recontamination of clean backfill material. Such measures may include installation of an impermeable barrier such as a polymer geomembrane or a bentonite mat placed at the overexcavation limits between clean backfill and the soil left in place. Rayonier will advise the City in the placement of such barriers.

4.2.2. Soil Sampling at Overexcavation Limits

In areas where the City overexcavates Type 3 soil, Rayonier will obtain discrete soil samples from the sidewalls and bottom of the excavation to document COPC concentrations remaining at the limits of the excavation. The soil samples will generally be collected on 20-foot centers and analyzed for the COPCs suspected to be present based on: (1) the observed characteristics of the visible contamination, and (2) the location of the contamination relative to historical mill facilities and previous soil sampling performed in the vicinity. Rayonier will confirm the post-overexcavation sampling plan with Ecology prior to sampling via a phone call and follow-up email communication.

4.2.3. Overexcavation Backfill

The City will backfill and compact overexcavated areas with clean fill. Backfill will be placed up to the elevation of the pipeline trench base (approximately 6 feet bgs in most areas of the CSO alignment). The backfill will be placed to surface grade outside of the pipeline trench area and sloped at 1H:1V at the margins of the trench.

4.3. Removal of Sediment from Deepwater Outfall Diffuser

The City will use suction dredging techniques to remove an estimated 10 to 50 CY of accumulated sediment from the 1,000-foot-long diffuser section of the former Rayonier Mill deepwater industrial wastewater outfall (Outfall 001). The suction dredge will be operated by divers. Rayonier assumes that the removed sediment will be temporarily stored on a barge anchored in the work area, and that the City's contractor will dewater the sediment before delivering it to Rayonier for stockpiling on the upland mill property. As discussed in Section 2.3, Rayonier anticipates that the dewatered sediment will meet the requirements of Type 1 (i.e., uncontaminated) soil. Rayonier will verify the sediment classification by collecting five to seven grab samples of the dewatered sediment and submitting them for laboratory analysis of dioxins, cPAHs, PCBs, and phenols.

5.0 MATERIALS MANAGEMENT REQUIREMENTS

This section outlines the general requirements for excavated materials management. It presents material volume estimates; plans for segregating, stockpiling, and/or disposing of excavated material; stockpile management/maintenance procedures; guidelines for soil stockpile sampling; and plans for managing and disposing of groundwater and stormwater. The existing Sampling and Analysis Plan, Quality Assurance Project Plan, and Health and Safety Plan prepared for the supplemental upland investigation (Appendices A, B, and C of the Work Plan; GeoEngineers, 2010) will be used where appropriate and applicable. If necessary, addenda to these plans will be

prepared and submitted for Ecology review and approval to cover the scope of the MMP-related elements of the CSO Project.

5.1. Material Volume Estimates

As detailed in Section 5.2, material excavated by the City during the CSO Project construction will be segregated by the City for stockpiling according to the material type/category, excavation location, and excavation depth. Rayonier will observe soil excavation conducted by the City and direct the delivery of soil to designated stockpile areas. The anticipated volumes of Type 1, Type 2A, and Type 2B soil are listed below. The anticipated volumes of Type 3 soil and construction debris were not estimated because there are insufficient data to derive these estimates.

- Type 1 soil: 5,300–6,000 CY.
- Type 2A soil: 9,300–11,600 CY.
- Type 2B soil: 5,600–6,800 CY.

The anticipated soil volumes listed above were estimated based on the estimated volume of soil to be excavated from each segment of the CSO alignment (summarized in Table 1) and the types of material expected to be present along the alignment as inferred from the existing analytical data (GeoEngineers, 2012b). The types of material expected to be present along the alignment are shown in Figure 1.

5.2. Material Segregation and Handling During Construction

Material excavated by the City during the CSO Project construction will be segregated by the City according to the material type/category, excavation location, and excavation depth. The categories of excavated materials are listed in Section 5.1. This section describes how the materials will be segregated and handled during construction. In general, materials excavated by the City west of Ennis Creek will be stockpiled on Rayonier-owned mill property west of Ennis Creek, and materials excavated by the City east of Ennis Creek will be stockpiled on Rayonier-owned mill property east of Ennis Creek.

5.2.1. Segregation by Material Type

Figure 1 shows the three main material types expected to be present along the CSO alignment (Type 1 soil, Type 2A soil, and Type 2B soil). This figure will be used by the City as a guide, along with survey information provided by the City's contractor, as the City segregates the excavated material based on material type. The majority of the excavated material is expected to be Type 2A soil. The City will segregate and stockpile all three material categories shown in Figure 1 separately; see Section 5.2.3.1 for details. If Type 3 soil (visibly contaminated soil) is encountered, the City will load the soil directly into roll-off containers staged in the stockpile areas by Rayonier for this purpose; see Section 5.2.3.2 for details. If concrete, wood, or other construction debris is encountered, the City will segregate and stockpile this material separately; see Section 5.2.3.3 for details.

5.2.2. Segregation by Excavation Location and Depth

In addition to segregation by material type, excavated material will likely be segregated by excavation location relative to Ennis Creek. In general, material excavated by the City west of Ennis

Creek will be stockpiled west of Ennis Creek, in the area labeled "Stockpile Area 1" on Figure 1, and material excavated by the City east of Ennis Creek will be stockpiled east of Ennis Creek, in the areas labeled "Stockpile Area 2". "Stockpile Area 3" is designated for concrete, wood, and other debris or other materials. All materials excavated by the City during the CSO Project will be stockpiled as directed by Rayonier in these three areas. Rayonier will prepare field documentation of stockpile construction that includes the origin (pipeline segment) of the soil placed in each stockpile and the date(s) of stockpile construction.

Along most of the CSO alignment, the City will segregate and stockpile soil excavated from all depths with like soils according to the expected soil categories identified in Figure 1. However, soil excavated by the City from the middle portion of piping segment 400-C-004 may be segregated by depth, as directed by Rayonier. The existing soil data suggest that shallow soil (≤2 feet bgs) in this area may be Type 1 soil, whereas deeper soil (>2 feet bgs) is likely to be Type 2A soil. Accordingly, the upper 2 feet of soil excavated in this area may be stockpiled as possible Type 1 soil, with soil deeper than 2 feet bgs stockpiled as suspected Type 2A soil. Rayonier will direct the delivery of this soil to designated stockpiles. This is the only portion of the CSO alignment where soil may be segregated based on excavation depth. The decision whether to segregate the upper 2 feet of soil in this area will be made in conjunction with the City and its contractor as part of final construction planning.

5.2.3. Material Handling/Stockpile Management Procedures

Rayonier will establish three stockpile staging areas on the Rayonier mill property, outside of the CSO Project construction areas. The proposed stockpile staging areas are shown in Figure 1. These staging areas were selected based on their locations relative to the planned CSO construction activities and their stormwater drainage characteristics. The SWPPP for the mill property (Landau Associates, 2010; see SWPPP Figure 2) indicates that in the proposed stockpile areas, stormwater infiltrates to the ground – there are no stormwater catch basins, piping, or outfalls in these areas. If necessary, in unpaved portions of the stockpile areas where the ground surface is uneven or otherwise unsuitable for long-term stockpile storage (e.g., in concrete rubble areas with uneven terrain), Rayonier will prepare the ground surface by constructing a compacted fill pad consisting of known Type 1 soil and/or imported clean fill. If Type 1 soil is used for pad construction, the City will excavate soil for this purpose from the CSO alignment intervals labeled "Type 1" in Figure 1. However, soil from these areas will be used only if Rayonier first samples the soil and determines through analytical testing that it meets the requirements for Type 1 soil (i.e., the soil must not contain COPC concentrations exceeding screening levels for unrestricted use). Rayonier will prepare and submit a sampling and analysis plan to Ecology for review and approval prior to conducting this sampling.

Rayonier will construct, protect, and maintain the stockpiles using BMPs (plastic liners/covers, silt fencing, etc.) that are designed to minimize stormwater contact and erosion of stockpiled materials and limit direct contact with the materials. The BMPs for stockpile construction and maintenance are included in Appendix C. The excavated materials placed in the stockpile staging areas will be kept separate from imported clean backfill and other construction materials/supplies needed for the CSO Project.

After the CSO excavation work is completed, Rayonier will maintain all excavated materials in the designated stockpile staging areas pending evaluation of appropriate reuse, storage, or off-site disposal options for the materials. Post-construction stockpile management and maintenance are discussed in Section 5.3. If Type 3 soil is encountered during construction, the City will overexcavate the soil under the direction of Rayonier as described in Section 4.2. The City will deliver Type 3 soil to roll-off containers provided by Rayonier, and Rayonier will characterize and dispose of the soil at an off-site, permitted facility. Similarly, construction debris (concrete, wood, etc.) will be delivered by the City to temporary stockpiles in the staging areas as directed by Rayonier. Rayonier will arrange for appropriate off-site recycling and/or disposal at a permitted facility. The stockpiles containing Type 1, Type 2A, and Type 2B soil may remain on the mill property until a cleanup remedy for the Study Area is selected and implemented.

5.2.3.1. TYPE 1 AND TYPE 2 SOIL

All excavated soil that is not visibly contaminated will be handled as if it is Type 2 soil; that is, it will be assumed to contain COPC concentrations greater than applicable screening levels for unrestricted use until future stockpile sampling completed by Rayonier indicates otherwise. However, soil designated as Type 1, Type 2A, and Type 2B based on the review of existing data will be segregated and stockpiled separately in the stockpile staging areas by the City as directed by Rayonier. Figure 1 shows the expected locations of these soil types. As noted previously, soil excavated by the City west of Ennis Creek will generally be stockpiled by the City west of Ennis Creek in Stockpile Area 1, and soil excavated by the City east of Ennis Creek will generally be stockpiled by the City east of Ennis Creek in Stockpile Areas 2 and 3.

Rayonier personnel or Rayonier's representatives will be present in the field during construction to oversee excavation activities, inform the City's contractor where each individual soil load should be dumped (i.e., which specific stockpile), and ensure that individual loads are dumped on the appropriate stockpiles. Type 1 and Type 2 soil will be placed on a plastic liner provided by Rayonier and completely covered with plastic sheeting by Rayonier; the plastic sheeting will be held down with sandbags, tires, and/or other weighted objects and rope to prevent wind from blowing the sheeting off the piles. Rayonier also will surround the stockpiles with silt fencing to further limit potential impacts from erosion. The detailed BMPs for stockpile construction and maintenance are included in Appendix C.

Individual soil stockpiles will contain no more than approximately 2,000 CY of excavated soil and will be roughly 8 feet or less in height. This maximum stockpile volume and height correspond to an individual stockpile footprint with approximate dimensions of 70 feet by 120 feet. For the total estimated soil volume to be excavated (20,000 to 24,000 CY), the 2,000 CY maximum stockpile volume equates to 10 to 12 individual stockpiles. It is anticipated that approximately equal numbers of stockpiles will be constructed in Stockpile Areas 1 and 2.

5.2.3.2. TYPE 3 SOIL

The methodology Rayonier will use to identify Type 3 (visibly contaminated) soil in the field during construction by the City is described in Section 4.1.3. If encountered, the City will segregate and place Type 3 soil in roll-off containers provided by Rayonier. Rayonier will sample the Type 3 soil, prepare waste profiles, and arrange for off-site transport and disposal at an appropriate permitted facility. The roll-off containers will be staged by Rayonier in advance in the stockpile areas to avoid delays during construction. Type 3 soil is assumed to be unsuitable for reuse on site and will be

sampled for chemical analysis of petroleum hydrocarbons, metals, and other known or suspected COPCs that may be present based on the observed characteristics of the contamination and the area and depth where the soil originated.

The City will adhere to BMPs when transferring Type 3 soil from excavation areas to roll-off containers. Rayonier will adhere to BMPs when transporting the soil off site for disposal. Specifically, the following guidelines will be followed:

- During excavation of Type 3 soil by the City, the soil will be loaded by the City directly into City dump trucks for hauling to the Rayonier roll-off containers. The City will load the trucks in a manner that prevents the spilling or tracking of contaminated soil during transport.
- Any loose soil falling onto the ground or the exterior of the trucks during loading will be collected by the City and placed in the trucks before the trucks leave the loading area.
- The City will haul Type 3 soil directly to the roll-off containers and dump the soil into the containers. If the soil cannot be dumped directly into the roll-off containers, the City will dump the soil on an impervious surface near the roll-off container as directed by Rayonier, and then the City will place the soil into the roll-off container using a front-end loader or similar equipment. Any loose soil falling onto the ground or the exterior of the roll-off containers during soil transfer will be collected by the City and placed in the containers. Care will be taken by the City not to exceed the rated weight capacity of the containers.
- At the end of each day that soil is placed in the roll-off containers, the containers will be covered with plastic sheeting by Rayonier to limit the potential for rainwater, humans, or wildlife to contact the soil. The plastic sheeting will be fastened securely using weights, rope, and/ or other means.
- After the Type 3 soil has been sampled and characterized by Rayonier and waste profiles have been submitted by Rayonier and approved by the selected disposal facility, Rayonier will arrange for transporting the roll-off containers to the disposal facility. Before any roll-off container is transported off site, the container will be covered by a tarp provided by the trucking contractor.

Transportation and disposal of contaminated soil will be conducted in accordance with applicable local, State, and Federal regulations as identified in Section 7.0. Rayonier, as owner of the mill property, will be the waste generator, and will be presented with waste profiles, waste authorization forms, and shipping documents for signature.

5.2.3.3. CONCRETE, WOOD, AND OTHER DEBRIS

Concrete, wood, and other construction debris removed from the CSO excavations by the City will be segregated from soil and temporarily stockpiled by the City in the stockpile staging areas prepared by Rayonier before being transported off site by Rayonier to a permitted disposal or recycling facility. The debris will be segregated by the City under the direction of Rayonier according to the composition of the debris; i.e., separate stockpiles will be constructed for each type of debris. The debris will be placed on a plastic liner provided by Rayonier and covered with plastic sheeting secured with sandbags, tires, and/or other weighted objects and rope. Construction debris will not be sampled for chemical analysis.

5.2.4. Handling of Sediment Removed from Deepwater Outfall Diffuser

As discussed in Section 2.3, Rayonier anticipates that the dewatered sediment removed from the deepwater outfall diffuser will meet the requirements of Type 1 soil. Accordingly, the City will place the dewatered sediment in a stockpile with other Type 1 soil excavated from the CSO alignment. The segregation and handling of Type 1 soil is described in Section 5.2.3.1.

5.3. Post-Construction Stockpile Management/Maintenance

After the excavation phase of the CSO Project is completed, Rayonier will continue to maintain the material stockpiles in Stockpile Areas 1, 2, and 3 pending evaluation of appropriate handling, reuse, storage, and/or disposal options as part of future interim action alternatives evaluations for the Study Area. Because an interim action for the Study Area may not be selected and implemented for some time after the current CSO Project is completed, the stockpiles may be maintained on site for a long period of time. Rayonier will perform regular inspections and maintenance of the stockpiles until the final disposition of the stockpiles is determined and fulfilled. The goal of the inspections and maintenance will be to ensure that installed BMPs for stockpile containment and erosion control are in sufficient condition to perform as intended. If any BMPs are found to be deficient, corrective action will be taken to correct the deficiencies so that human health and the environment will continue to be protected.

5.4. Soil Stockpile Sampling

As discussed in Section 5.2.3.2, Type 3 (visibly contaminated) soil placed in roll-off containers will be sampled by Rayonier for chemical analysis of petroleum hydrocarbons, metals, and other known or suspected COPCs that may be present based on the observed characteristics of the contamination and the area and depth where the soil originated.

If excavated soil is being considered for reuse or handling in another way after stockpiling, further sampling and evaluation of the soil will be completed by Rayonier as necessary. For example, stockpiled soil classified as possible Type 1 soil may be sampled to determine if it meets Type 1 requirements. Sampling of soil stockpiles, if conducted, will consider the types of COPCs expected to be present in the soil as inferred from existing analytical data. For example, existing data indicate that dioxin concentrations in deep soil (>2 feet bgs) exceed screening levels less frequently than in shallow soil; therefore, the number of stockpile soil samples analyzed for dioxins would be less for deep soil stockpiles than for shallow soil stockpiles. Prior to sampling any stockpiles, Rayonier will submit a stockpile sampling plan for Ecology review and approval.

5.5. Groundwater and Stormwater Management and Disposal

Excavation dewatering, if necessary, will be conducted by the City as outlined in the document *Draft Geotechnical Report, City of Port Angeles – Francis Street Combined Sewer Overflow Diversion Project* (Shannon & Wilson, 2010) and the final construction plans prepared by the City's consultant. Groundwater generated during dewatering activities likely will require pretreatment prior to discharge to the City's wastewater treatment plant. Pretreatment will be performed by the City's contractor and is described in the City's stormwater permit application.

Management of stormwater in the stockpile staging areas will not be necessary, as the BMPs for stockpile construction and maintenance (Appendix C) are designed to prevent soil erosion and contact of rainwater/stormwater with the stockpiles.

6.0 HEALTH AND SAFETY

Rayonier will prepare an addendum to the Work Plan HASP that addresses the specific construction elements of the CSO Project prior to beginning construction. Rayonier and its contractors will follow this HASP. The City and its contractors will prepare their own HASP.

7.0 REQUIRED PERMITS AND APPROVALS

The City of Port Angeles has obtained or applied for the following permits associated with the CSO Project:

- Washington Department of Ecology
  - Section 401/Water Quality Certification.
  - Coastal Zone Management Act Consistency Determination.
  - National Pollutant Discharge Elimination System (NPDES) Permit, RCW 90.48.
- US Army Corps of Engineers
  - Section 404 (Nationwide Permit anticipated).
    - National Oceanic and Atmospheric Administration Fisheries National Marine Fisheries Service.
    - Biological Evaluation.
- Washington Department of Fish and Wildlife
  - Hydraulic Project Approval application (Joint Aquatic Resource Permit Application [JARPA] form).
- City of Port Angeles
  - State Environmental Policy Act (SEPA) Determination.
  - Land Use/Critical Areas Permits.
    - Critical Areas Report/Conceptual Mitigation Plan.
    - Wetlands/Sensitive Areas permit.
  - Shoreline Permit Application.
    - Shoreline Conditional Use Permit Review with appeal.
  - Construction-Related Permits.
    - Clearing and Grading Permit.
    - Right-of-Way Permit.

In accordance with Agreed Order No. DE 6815 (the Order), Section VIII.P, Rayonier is responsible for obtaining any additional permits and approvals for its implementation of the MMP, or for complying with the substantive requirements of any permits or approvals covered by the procedural exemption of Revised Code of Washington (RCW) 70.105D.090(1). Rayonier will determine these additional requirements and inform Ecology of them in a separate submittal.

8.0 ARCHAEOLOGICAL AND HISTORICAL PRESERVATION

A Klallam Indian village was historically located on the eastern bank of Ennis Creek that supported a population of hunter-fisher-gatherers prior to Euro-American contact. The Klallam village site was recorded and listed on the Washington Heritage Register, although no archaeological deposits associated with the Rayonier Mill property were recorded (LAAS, 1997).

The National Historic Preservation Act (Section 106) will be applicable if any materials of archaeological interest are discovered during the planned excavation activities. Excavation work described in this Plan will be monitored in accordance with the City's archaeological work plan (City of Port Angeles, 2009). The City will be responsible for arranging for archaeological monitoring, making any necessary notifications, and procuring any required permits.

9.0 INTERIM ACTION SUBMITTALS

Rayonier will prepare a CSO Materials Management Completion Report for Ecology review and approval following CSO construction. The completion report will describe quantities of soil, debris, groundwater, and stormwater removed; characterization and disposition of excavated materials; and results of any post-overexcavation sampling and actions taken based on results. Chemical analytical data will be submitted to Ecology in both printed and electronic forms. In addition, if excavated soil is being considered for reuse or handling in another way after stockpiling, a stockpile sampling plan will be submitted for Ecology review and approval before any stockpiles are sampled.

10.0 SUBMITTAL SCHEDULE

CSO Project construction is expected to begin in the summer or fall of 2012. Rayonier will submit the following documents as scheduled for Ecology review and approval:

Submittal	Scheduled Delivery
CSO Materials Management Completion Report	Within 90 calendar days of the effective completion of the CSO Project
Stockpile Sampling Plan	Prior to stockpile characterization sampling, if conducted
Sampling and Analysis Plan for Type 1 Soil (To be submitted if sampling of in-place soil is conducted prior to excavation and stockpiling, as discussed in Section 5.2.3)	Prior to sampling of in-place soil assumed to meet Type 1 requirements, if conducted
Additional Permits and Approvals Determination	90 days after the effective date of the Agreed Order amendment adopting this MMP

11.0 REFERENCES

Brown and Caldwell, 2009. "Environmental Investigation Report at the Former Rayonier Mill Site." (Draft.) December 29, 2009.

City of Port Angeles, 2009. "Archaeological Work Plan for the City of Port Angeles Exploratory Design Work (Phase 1) of the Combined Sewer Overflow Project." June 2009.

City of Port Angeles, 2010. "CSO Phase I Project Rayonier Site Right-of-Way Plan." March 10, 2010.

Farallon Consulting, L.L.C. (Farallon), 2011. "Baseline Subsurface Environmental Assessment, Portion of Rayonier Mill Property, 700 North Ennis Street, Port Angeles, Washington." November 10, 2011.

GeoEngineers, Inc., 2010. "Supplemental Upland Data Collection Work Plan for the Upland Portion of the Study Area, Port Angeles Rayonier Mill Site, Port Angeles, Washington." GEI File No. 0137-015-03, July 20, 2010.

GeoEngineers, Inc., 2012a. "Interim Action Report Volume I: Upland Data Summary Report for the Study Area, Port Angeles Rayonier Mill Site, Port Angeles, Washington" (Public Review Draft). GEI File No. 0137-015-03, April 30, 2012.

GeoEngineers, Inc., 2012b. "Classification of Soil along the City of Port Angeles Combined Sewer Overflow (CSO) Pipeline Alignment" (Technical Memorandum). GEI File No. 0137-015-03, May 22, 2012.

Landau Associates, 2010. "Stormwater Pollution Prevention Plan, Former Mill Site, Port Angeles, Washington." June 18, 2010.

Larson Anthropological/Archaeological Services (LAAS), 1997. "Rayonier, Incorporated Port Angeles Mill, Port Angeles, Clallam County, Washington, Dismantling and Remediation Project Cultural Resource Assessment." September 12, 1997.

Shannon & Wilson, 2010. "Draft Geotechnical Report, City of Port Angeles – Francis Street Combined Sewer Overflow Diversion Project, Port Angeles, Washington." April 2, 2010.

Washington State Department of Ecology, 2010. Agreed Order No. DE 6815 with Rayonier Properties, LLC. March 25, 2010.

TABLES

GeoEngineers

Table 1

Estimated Volume of Soil to be Excavated in CSO Project Area
City of Port of Angeles CSO Construction Project

Port Angeles Rayonier Mill Site
Port Angeles, Washington

CSO Project Design Information			Piping Trench Dimensions				Estimated Excavation Volume	
Piping Segment/Drawing No.	STA Interval	Pipes	Length (feet)	Depth (feet)	Width (feet)	Volume (cubic yards)	Total Volume In-Place (cubic yards)	Total Volume Stockpiled [1] (cubic yards)
300-C-004	25+20 to 30+40	30" RS	76	8	12	270	1,567	1,959
		24" RS						
		36" RSG	146	8	5	216		
		30" RS	374	6	13	1,080		
		24" RS						
		36" RSG						
400-C-001	30+40 to 35+60	30" RS	520	6	13	1,502	1,502	1,878
		24" RS						
		36" RSG						
400-C-002	35+60 to 40+80	30" RS	520	6	13	1,502	1,502	1,878
		24" RS						
		36" RSG						
400-C-003	40+80 to 46+00	30" RS	180	6	13	520	520	650
		24" RS						
		36" RSG						
400-C-004	46+00 to 51+20	30" RS	400	10	13	1,926	2,993	3,741
		24" RS						
		36" RSG						
		30" RS	120	9	23	920		
		24" RS						
		36" RSG						
		36" SE						
		14" RS						
		36" RSG	120	5.5	6	147		
400-C-005	51+20 to 56+40	30" RS	520	6.5	23	2,879	3,515	4,394
		24" RS						
		36" RSG						
		36" SE						
		14" RS						
		36" RSG	520	5.5	6	636		

CSO Project Design Information			Piping Trench Dimensions				Estimated Excavation Volume	
Piping Segment/Drawing No.	STA Interval	Pipes	Length (feet)	Depth (feet)	Width (feet)	Volume (cubic yards)	Total Volume In-Place (cubic yards)	Total Volume Stockpiled [1] (cubic yards)
400-C-006	56+40 to End	16" RSG	200	7.5	28	1,556	1,689	2,111
		30" RS						
		24" RS						
		36" RS						
		12" RS						
		36" RS						
		36" RSG	200	3	6	133		
700-C-001	702+00 to RPS	36" RS	220	6.5	23	1,218	2,440	3,050
		12" RS						
		3" 3WHP						
		36" RS						
		24"RS						
		30" RS						
		36" SE	220	5.5	6	269		
		36" RS	220	6.5	12	636		
		12" RS						
		36" SE	220	6.5	6	318		
700-C-003	719+95.00 to 720+78.30	42" SE	88	15	8	391	391	489
		48" SE						
						Totals ===>	**16,119**	**20,149**

Trench Dimension Notes:

Depth calculated as largest pipe diameter plus 1.5 feet backfill/berm above and 1.5 feet bedding below (per Brown & Caldwell), unless depicted otherwise on design drawings.

Depth calculation for 400-C-004 assumes an average depth of 5 feet to top of shallowest pipe based on design drawings.

Width estimate taken from design drawings, or calculated as additive diameter of all pipes plus 1 foot between and 1 foot on either side (where not provided on drawings; per Brown & Caldwell).

Trench length for 400-C-003 estimated based on 65% of the total length of the segment planned for construction above existing surface grade (per drawings).

Notes:

STA = Station

[1] Estimated swell factor is 12% (sand) to 25% (loam). Assumption of 25% was used.

[2] The majority of segment 300-C-002 is on City-owned property outside of the former mill operating areas and is not included in the interim action; therefore, the soil volume estimates for this segment are not included in the totals shown at the bottom of this table.

FIGURES

GeoEngineers

PORT ANGELES HARBOR

Fuel Oil Tanks 1 and 2 Area

Main Process Area

Stockpile Area 1

Log Yard

Stockpile Area 2

Stockpile Area 3

Pre-Fab Area

Chlorine Dioxide Generator

Primary Clarifier

Ennis Creek

Storage Tank Stair Tower

Secondary Treatment

CSO Return Pump Station

Equipment Storage Area

Drainage Ditch

Effluent Diversion Structure

Influent Diversion Structure

BLUFF

MW-55 MW-51 PZ-3 MW-56 MW-54 TP-01 TP-02 TP-20 MW-66 GWG-3 MW-62 TP-03 SSB-7 MW-57 MW-53 GWG-2 GWG-4 PZ-2 SSB-6 MW-58 MW-67 TP-18 TP-12 TP-05 TP-19 TP-13 GWG-5A MW-29 TP-04 MW-23 TP-11 SSB-1 MW-65 SSB-5 PIPE-1-SR23 GWG-5 MW-28 MW-63 SSB-2 TP-06 PZ-4 SSB-3 GWG-1 MW-61 GWG-9 TP-17 TP-16 MW-68 TP-14 MW-60 TP-07 SSB-4 MW-52 SSB-8 PA-13 TP-15 TP-21 TP-10 PA-16 PA-14 TP-09 PA-1 TP-08 PA-15 MW-69 PA-17 PA-18 MW-70 GWG-7 GWG-6 PZ-5 PA-19 PZ-9 PA-25 PA-24 MW-59 PZ-10 GWG-8 PZ-7 B-103 PA-20 PZ-6 TP-4 SW-5 FAR-11 B-114 SSB-10 PZ-11 B-108 PA-21 PA-2 PZ-12 PA-22 B-118 FAR-16 B-13 PA-23 SSB-9 TP-2 TP-3

300-C-003 200-C-004 300-C-004 300-C-007 400-C-001 400-C-002 400-C-003 700-C-003 400-C-004 700-C-001 400-C-005 700-C-002 400-C-006 500-C-001

Supplemental Upland Investigation (SUI) Groundwater Grab Sample

SUI Soil Boring

SUI Monitoring Well

Monitoring Well Installed Prior To or After SUI

SUI Test Pit

SUI Pipe Contents Sample

Soil Sample(s) Collected Prior To or After SUI

CSO Soil Boring (2009)

CSO Test Pit

Previous Geotechnical Boring

Abandoned Rayonier Pipe

CSO Project Phase I Pipe

CSO Construction Easement

CSO Structures

300-C-004 City Phase I CSO Project Drawing Number

City Purchase - Lots 1 and 2

City Easements - Existing and New

Anticipated Soil Types Along CSO Alignment

Type 1 Soil: 0-2'

Type 1 Soil

Type 2A Soil

Type 2B Soil

Interim Action Areas & Material Quantities Removed

Finishing Room - 10,150 tons soil (hydraulic oil/PCBs; 1993, 1998, 2002)

Fuel Tank No. 2 - 5,400 tons soil (Bunker C; 1993, 2002)

Hog Fuel Pile - 2,700 cy wood residue (diesel & heavy oil; 2001)

Machine Shop - 970 tons soil (diesel & heavy oil; 2002)

SSL Lagoon - 4,800 tons soil (arsenic; 2001)

Wood Mill & Fuel Tank No.1 - 7,980 tons soil (hydraulic oil & Bunker C; 2006)

N W E S

100 0 100

Feet

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

CSO Project Area

Port Angeles Rayonier Mill Study Area
Port Angeles, Washington

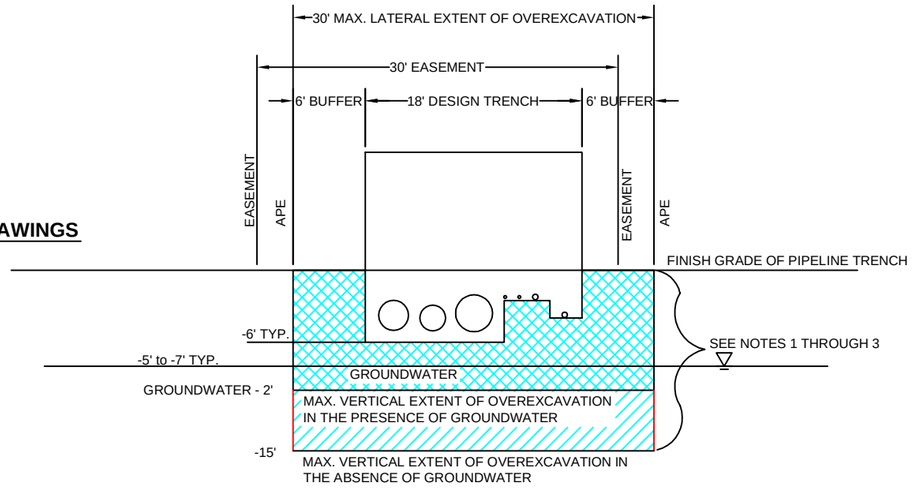
GeoEngineers

Figure 1

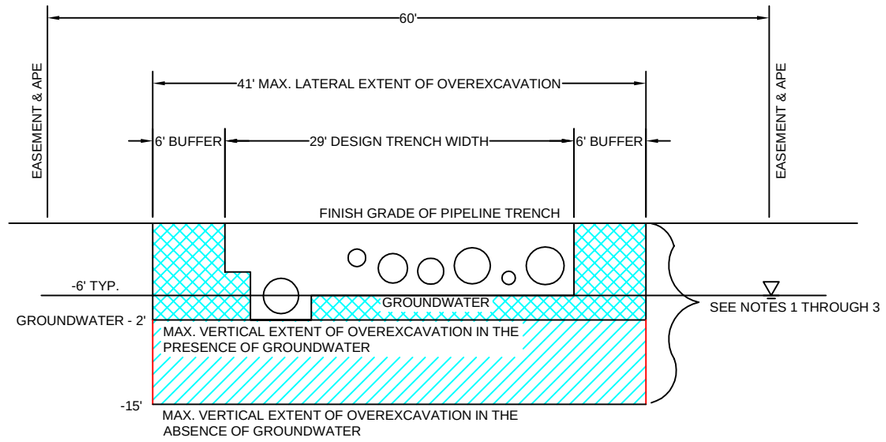
Office: Seattle Path: \\Seaprojects\0\013701\GIS\GIS\013701503_F1_CSOProjectArea.mxd Modified: April 9, 2012 CRC

SECTION NO. IN CITY DESIGN DRAWINGS

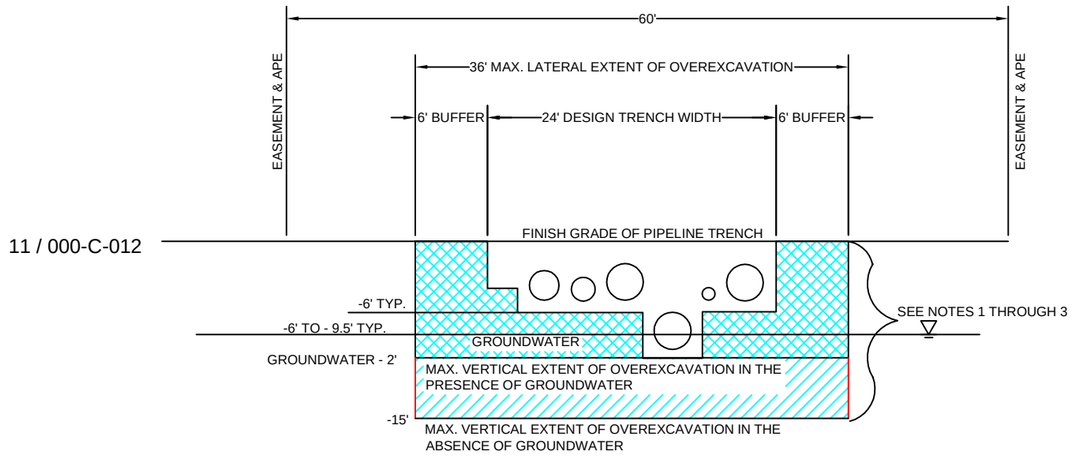
5 / 000-C-011
6 / 000-C-001
7 / 000-C-011
8 / 000-C-011



12 / 000-C-012



11 / 000-C-012



Notes:

1. Soil generally consists of 1 to 15 ft. of fill (sand, gravel, silt) overlying native deposits (beach deposits / alluvium / colluvium / recessional outwash).
2. Trench and overexcavated area (depicted by hachures) will be backfilled with clean fill, resulting in 6 ft. cap (min.) of clean soil for protection of human health and terrestrial ecological receptors.
3. If any contaminated soil exceeding cleanup levels is left in place beneath the trench or within the 6-ft. buffer and above 15-ft. bgs, an environmental covenant will be used to protect against potential future human or terrestrial wildlife exposures.
4. APE = Area of Potential Effects
5. The locations of all features shown are approximate.
6. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Overexcavation and Post-Pipeline Construction Cross-Sections

Port Angeles Rayonier Mill Study Area
Port Angeles, Washington

GeoEngineers

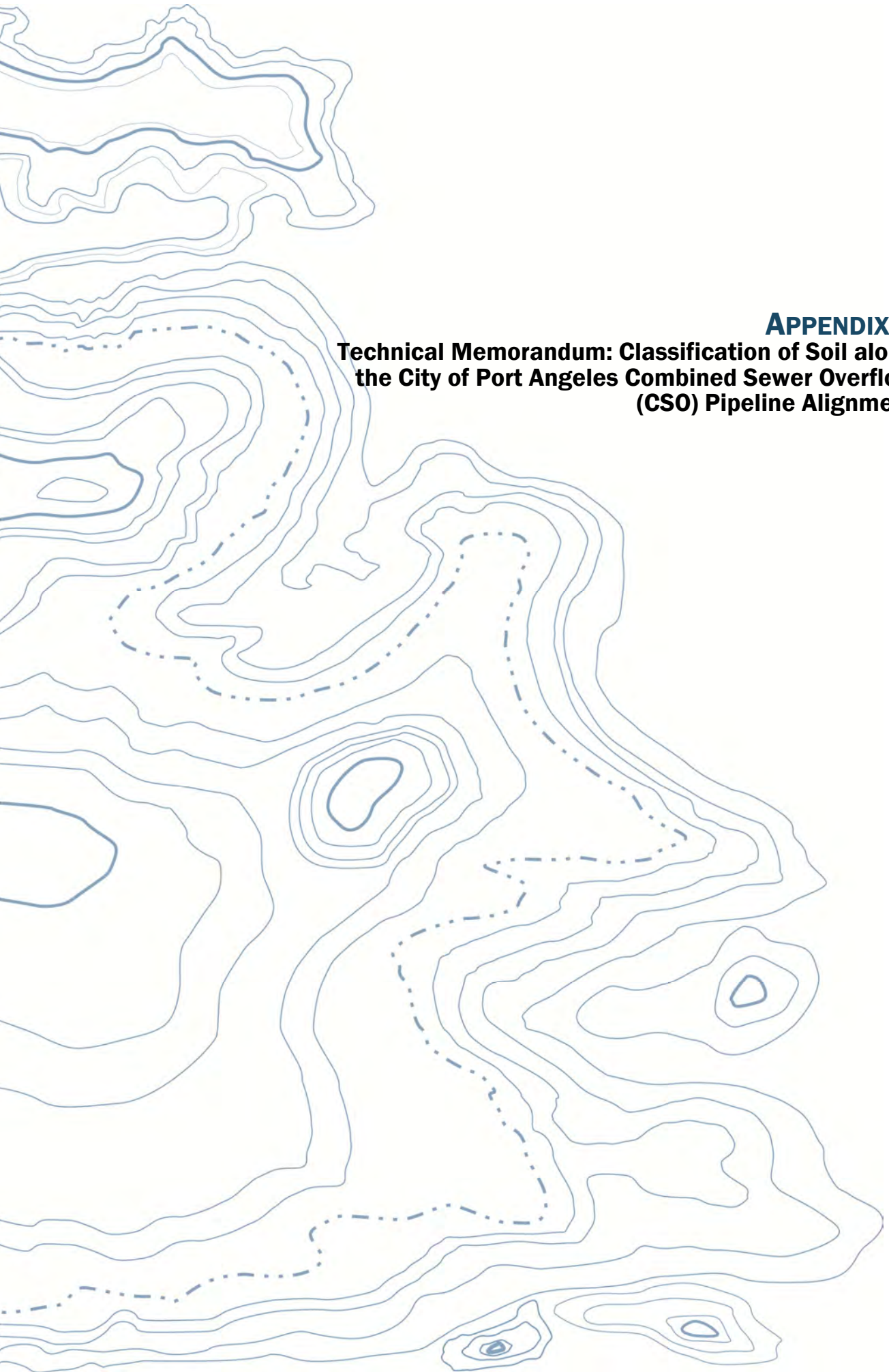
Figure 2

RL : RBM

W:\Seattle\Projects\00\137015\03\TRENCH OVEREXCAVATION.dwg\TAB:FIG 3 modified on Aug 12, 2011 - 5:05pm

APPENDICES

GeoEngineers



APPENDIX A

Technical Memorandum: Classification of Soil along the City of Port Angeles Combined Sewer Overflow (CSO) Pipeline Alignment

GeoEngineers

Plaza 600 Building, 600 Stewart Street, Suite 1700, Seattle, WA 98101, Telephone: 206.728.2674, Fax: 206.728.2732 www.geoengineers.com

Technical Memorandum

Date:	May 22, 2012
File:	0137-015-03
Subject:	Classification of Soil along the City of Port Angeles Combined Sewer Overflow (CSO) Pipeline Alignment

INTRODUCTION

In anticipation of the soil excavation to be performed during the City of Port Angeles' (City's) Phase I Combined Sewer Overflow (CSO) Project, chemical analytical data from previous soil sampling conducted along the CSO pipeline alignment within the Rayonier Mill Upland Study Area were reviewed to characterize the concentrations of contaminants of potential concern (COPCs) that may be present in the soil. The objective of the data review was to classify soil along the CSO alignment as Type 1, Type 2A, or Type 2B soil based on the existing COPC concentration data, as well as known historical mill operations and areas of contamination along the alignment. Soils were classified by comparing COPC concentrations to the numerical screening levels presented in the Public Review Draft *Interim Action Report Volume I: Upland Data Summary Report for the Study Area* (Upland Data Summary Report; GeoEngineers, 2012a). In areas where data were sparse, or where additional information regarding historical mill operations or areas of known contamination was available, inferences regarding COPC concentrations were made in order to complete the soil classification along the entire CSO alignment.

As detailed in the *Materials Management Plan, City of Port Angeles CSO Construction Project* (MMP; GeoEngineers, 2012b), the three categories of soil are defined as follows:

- Type 1: soil with COPC concentrations less than screening levels (i.e., soil that can be reused on the mill property without restriction).
- Type 2A: soil with COPC concentrations greater than screening levels but less than ten times the screening levels.
- Type 2B: soil with COPC concentrations greater than ten times the screening levels.

As described in the MMP, the classification of soils presented herein will be used to facilitate proper segregation and handling of the soil excavated during the CSO Project. Soil stockpiled during the CSO Project will not be redistributed for unrestricted use on site without first being sampled to confirm that COPC concentrations are below applicable screening levels presented in the Upland Data Summary Report.

EVALUATION METHOD

Analytical data for soil samples collected in the vicinity of the CSO pipeline alignment during the 1997 Expanded Site Inspection (ESI), the 2003 Upland Remedial Investigation (RI), and interim actions completed between 2002 and 2006 were reviewed to evaluate COPC concentrations relative to the screening levels presented in the Upland Data Summary Report. Only data for soil samples obtained from depths equal to or less than the design depth of the planned trench excavation within each pipeline segment were reviewed.

Figure 1 shows the locations of the soil samples used in this evaluation. The results of the analytical data review are presented in Table 1. Table 1 lists the sample locations used to classify the soil within each pipeline segment, the depth range and number of soil samples evaluated at each location, and for each COPC group analyzed at a given sampling location, the soil classification based on the comparison of COPC concentrations to screening levels. The soil data were reviewed, and the soil classified, for two different depth intervals: 0 to 2 feet below ground surface (bgs), and greater than 2 feet bgs.

The classification of soil at a given sample location was determined by the "worst case" (i.e., most contaminated) soil type defined for the individual COPC groups analyzed at that location. For example, if polychlorinated biphenyl (PCB) and carcinogenic polycyclic aromatic hydrocarbon (cPAH) concentrations in soil at a given sampling location were below screening levels (i.e., Type 1 soil), but metals concentrations at the same location exceeded screening levels by a factor less than ten (i.e., Type 2A soil), the soil was classified as Type 2A. The classification results for individual soil sample locations are shown in Figure 1, along with the inferred soil types along the entire CSO pipeline alignment.

REFERENCES

GeoEngineers, Inc., 2012a. "Interim Action Report Volume I: Upland Data Summary Report for the Study Area, Port Angeles Rayonier Mill Site, Port Angeles, Washington" (Public Review Draft). GEI File No. 0137-015-03, April 30, 2012.

GeoEngineers, Inc., 2012b. "Materials Management Plan, City of Port Angeles CSO Construction Project, Port Angeles Rayonier Mill Site, Port Angeles, Washington." GEI File No. 0137-015-03, May 29, 2012.

TABLE A-1

Classification of Soil Types Along CSO Pipeline Alignment
Port Angeles Rayonier Mill Study Area
Port Angeles, Washington

Sample Location ID	CSO Pipeline Segment	Depth Range of Samples Used to Classify Soil (no. samples in range)	Shallow Soil (Samples Obtained from 0-2 feet bgs)									Deep Soil (Samples Obtained from >2 feet bgs)									Metals/non-PAH SVOCs with Exceedances, and Hot Spot Concentrations (defined as > 10x SL)
			TPH	PCBs	cPAHs	ncPAHs	non-PAH SVOCs	Pest*	Metals	Dioxins	VOCs**	TPH	PCBs	cPAHs	ncPAHs	non-PAH SVOCs	Pest*	Metals	Dioxins	VOCs**	
EC020	300-C-004	0-0.66' (1)	–	–	–	–	–	–	ND>SL	1	–	–	–	–	–	–	–	–	–	–	
GB05	300-C-004	0-4' (2)	–	ND>SL	2A	1	ND>SL	–	2A	–	–	–	ND>SL	ND>SL	1	ND>SL	–	2A	–	–	Shallow: Se; Deep: Ag
GB06	300-C-004	0-2' (1)	–	ND>SL	2A	1	ND>SL	–	ND>SL	–	–	–	–	–	–	–	–	–	–	–	
GB08	300-C-004	0-4' (2)	–	ND>SL	2A	1	ND>SL	–	2A	–	–	–	ND>SL	ND>SL	1	ND>SL	–	ND>SL	–	–	Shallow: Mn, Ag (Note: the deep ESI sample [2-4'] had Pb > 100x SL, but a subsequent RI sample [0.25-7'] did not exceed for Pb)
LY20	300-C-004	0-11.5' (2)	–	–	–	–	–	–	–	2A	–	–	–	–	–	–	–	–	1	–	
SSB-8	300-C-004	2-6.5' (2)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2A	–	–	Deep: Cd, Pb, Hg, Zn
B-17	400-C-001	5-5' (1)	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	
EC021	400-C-001	0-0.66' (1)	–	–	–	–	–	–	ND>SL	1	–	–	–	–	–	–	–	–	–	–	
EC035	400-C-001	0-0.5' (1)	–	–	–	–	–	–	2A	–	–	–	–	–	–	–	–	–	–	–	Shallow: Hg
FOT-EX-12	400-C-001	6-6' (1)	–	–	–	–	–	–	–	–	–	1	ND>SL	1	1	–	–	–	–	–	
FOT-EX-17	400-C-001	3-3' (1)	–	–	–	–	–	–	–	–	–	1	2B	2A	1	–	–	–	–	–	Deep: PCBs = 0.25 ppm
FOT-EX-25	400-C-001	5-5' (1)	–	–	–	–	–	–	–	–	–	1	ND>SL	1	1	–	–	–	–	–	
FOT-EX-6	400-C-001	3-3' (1)	–	–	–	–	–	–	–	–	–	1	ND>SL	1	1	–	–	–	–	–	
FOT-EX-7	400-C-001	3-3' (1)	–	–	–	–	–	–	–	–	–	1	ND>SL	1	1	–	–	–	–	–	
FOT-EX-9	400-C-001	6-6' (1)	–	–	–	–	–	–	–	–	–	1	ND>SL	1	1	–	–	–	–	–	
GB02	400-C-001	0-4' (2)	–	ND>SL	ND>SL	1	ND>SL	–	2A	–	–	–	ND>SL	2A	1	ND>SL	–	2A	–	–	Shallow: Ag; Deep: Ag
GB03	400-C-001	0-4' (2)	–	ND>SL	ND>SL	1	ND>SL	–	2A	2A	–	–	ND>SL	2A	1	ND>SL	–	2A	–	–	Shallow: Cd, Co, Cu; Deep: Cu, Ag
GB04	400-C-001	0-2' (1)	–	ND>SL	ND>SL	1	2A	–	2A	–	–	–	–	–	–	–	–	–	–	–	Shallow: Ba, Cd, Cu, Mn, Ag, Zn, PCP
MW-60	400-C-001	2-3.5' (1)	–	–	–	–	–	–	–	–	–	2A	2B	2A	1	2A	–	1	–	–	Deep: PCBs = 0.10 ppm, PCP (Note: the only metal analyzed at MW-60 was Pb)
TP-08	400-C-001	2-5' (2)	–	–	–	–	–	–	–	–	–	1	2A	1	1	1	–	2A	–	–	(Note: the only metal analyzed at TP-08 was Pb)
EC022	400-C-002	0-0.66' (1)	–	–	–	–	–	–	ND>SL	2A	–	–	–	–	–	–	–	–	–	–	
SSB-4	400-C-002	5-6.5' (1)	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	2A	–	–	Deep: Cr, Cu, Ni
TP-09	400-C-002	2-3' (2)	–	–	–	–	–	–	–	–	–	1	–	1	1	1	–	–	–	–	
TP-10	400-C-002	2-3' (2)	–	–	–	–	–	–	–	–	–	1	2A	1	1	1	–	2A	–	–	Deep: Pb (Note: the only metal analyzed at TP-10 was Pb)
TP-15	400-C-002	2-4' (2)	–	–	–	–	–	–	–	–	–	2A	2A	2A	1	ND>SL	–	2B	–	–	Deep: Pb = 800 ppm (Note: the only metal analyzed at TP-15 was Pb)
TP-21	400-C-002	3-3' (1)	–	–	–	–	–	–	–	–	–	1	1	1	1	1	–	1	–	–	(Note: the only metal analyzed at TP-21 was Pb)
CD02	400-C-003	0-6' (3)	–	ND>SL	2A	1	ND>SL	–	2A	–	–	–	ND>SL	ND>SL	1	ND>SL	–	2A	–	–	Shallow: Cu, Pb, Hg; Deep: Ba, Cu, Pb, Hg, Ag, Zn
GWG-6	400-C-003	2-6.5' (2)	–	–	–	–	–	–	–	–	–	1	1	1	1	1	–	2A	–	–	Deep: Cr, Ni
GWG-7	400-C-003	2-6.5' (2)	–	–	–	–	–	–	–	–	–	1	1	1	1	1	–	2A	–	–	Deep: Ba, Cr, Co, Se
MW-69	400-C-003	2-6.5' (2)	–	–	–	–	–	–	–	–	–	1	1	1	1	1	–	2A	–	–	Deep: Cu, Hg
MW-70	400-C-003	2-6.5' (2)	–	–	–	–	–	–	–	–	–	1	1	1	1	1	–	2A	–	–	Deep: Cu, Mn, Ni
PF03	400-C-003	0-6' (3)	–	ND>SL	ND>SL	1	ND>SL	–	2A	–	–	–	ND>SL	ND>SL	1	ND>SL	–	2A	1	–	Shallow: Cu; Deep: Cu, Hg, Ag
FAR1	400-C-003	6-6.5' (1)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	
GWG-8	400-C-004	2-11.5' (2)	–	–	–	–	–	–	–	–	–	1	1	1	1	1	–	2A	–	–	Deep: Cr, Ni
PA-19	400-C-004	7.5-9' (1)	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1	–	–	
PF01	400-C-004	0-4' (2)	–	ND>SL	ND>SL	1	ND>SL	–	ND>SL	–	–	–	ND>SL	ND>SL	1	ND>SL	–	2A	–	–	Deep: Cu
FAR2	400-C-004	2.5-6' (2)	–	–	–	–	–	–	–	–	–	1	1	1	1	1	1	1	–	1	
FAR4	400-C-004	4-9.5' (2)	–	–	–	–	–	–	–	–	–	1	1	1	1	1	1	2A	–	1	Deep: Cr, Pb
FAR5	400-C-004	0.5-1' (1)	1	1	1	1	1	1	1	–	1	–	–	–	–	–	–	–	–	–	
FAR6	400-C-004	0.5-1' (1)	2A	1	2B	1	1	1	2A	–	1	–	–	–	–	–	–	–	–	–	Shallow: cPAHs = 1.64 ppm, Pb
FAR8	400-C-004	5-11.5' (2)	–	–	–	–	–	–	–	–	–	2A	–	–	–	–	–	1	–	1	
BY01	400-C-005	0-4' (2)	–	2B	2A	1	ND>SL	–	2A	–	–	–	2A	ND>SL	1	ND>SL	–	2A	–	–	Shallow: PCBs = 0.066 ppm, Cu, Hg; Deep: Ba, Cu, Mn, Ni, Ag, Tl, Zn
BY03	400-C-005	0-4' (2)	–	2B	ND>SL	1	ND>SL	–	2A	–	–	–	2A	2A	1	ND>SL	–	2A	–	–	Shallow: PCBs = 0.054 ppm, Cu, Pb, Hg, Ni, Zn; Deep: Ba, Cr, Cu, Pb, Mn, Hg, Ni, Ag, Zn
BY04	400-C-005	0-4' (2)	–	2B	ND>SL	1	ND>SL	–	2A	–	–	–	ND>SL	ND>SL	1	ND>SL	–	2A	–	–	Shallow: PCBs = 0.065 ppm, Cu, Pb, Hg, Zn; Deep: Ba, Ag
BY05	400-C-005	0-10' (5)	–	2B	2A	1	ND>SL	–	2A	–	–	–	2A	ND>SL	1	ND>SL	–	2B	–	–	Shallow: PCBs = 0.087 ppm, Cr, Cu, Mn, Ag; Deep: Ag(max) = 15 ppm, Ba, Cr, Co, Cu, Pb, Mn, Hg, Ni, Tl, Zn

Sample Location ID	CSO Pipeline Segment	Depth Range of Samples Used to Classify Soil (no. samples in range)	Shallow Soil (Samples Obtained from 0-2 feet bgs)									Deep Soil (Samples Obtained from >2 feet bgs)									Metals/non-PAH SVOCs with Exceedances, and Hot Spot Concentrations (defined as > 10x SL)
			TPH	PCBs	cPAHs	ncPAHs	non-PAH SVOCs	Pest*	Metals	Dioxins	VOCs**	TPH	PCBs	cPAHs	ncPAHs	non-PAH SVOCs	Pest*	Metals	Dioxins	VOCs**	
BY20	400-C-005	0-8.5' (2)	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--	1	--	--	(Note: the only metal analyzed at BY20 was As)
EC030	400-C-005	0-0.5' (1)	--	--	--	--	--	--	--	2A	--	--	--	--	--	--	--	--	--	--	
SSB-10	400-C-005	2-11.5' (3)	--	--	--	--	--	--	--	--	--	--	1	1	1	1	--	2A	2A	--	Deep: Ba, Cr, Cu, Mn, Hg, Ni, Zn
FAR13	400-C-005	2.5-6.5' (2)	--	--	--	--	--	--	--	--	--	1	--	1	1	1	--	1	--	1	
FAR14	400-C-005	3.5-4' (1)	--	--	--	--	--	--	--	--	--	1	--	--	--	--	--	1	--	1	
FAR17	400-C-006	2.5-8.5' (2)	--	--	--	--	--	--	--	--	--	1	1	1	1	1	1	2A	--	1	Deep: Cr
FAR7	700-C-001	2.5-6.5' (2)	--	--	--	--	--	--	--	--	--	1	1	--	--	--	1	1	--	1	
FAR8	700-C-001	5-11.5' (2)	--	--	--	--	--	--	--	--	--	2A	--	--	--	--	--	1	--	1	
FAR9	700-C-001	2.5-6.5' (2)	--	--	--	--	--	--	--	--	--	2A	--	1	1	1	--	2A	--	1	Deep: Cr, Pb
FAR10	700-C-001	2.5-15.5' (3)	--	--	--	--	--	--	--	--	--	2A	1	1	1	1	1	2A	--	1	Deep: Pb
FAR21	700-C-001	2.5-6.5' (2)	--	--	--	--	--	--	--	--	--	2A	1	1	1	1	1	2A	--	1	Deep: Pb

Notes:

1 = Type 1 soil (no SL exceedances)

2A = Type 2A soil (at least one SL exceedance, but none > 10x SL)

2B = Type 2B soil (at least one SL exceedance > 10x SL)

SL = Screening level

ND>SL = No detections exceeded SLs, but at least one non-detect result exceeded the SL.

* The only pesticide SL exceedances in soil samples were exceedances of the soil-to-groundwater SLs; however, pesticides were not detected in groundwater during the 2010-2011 monitoring. Therefore, existing pesticide concentrations in soil are protective of all three exposure pathways - no soil was classified as Type 2 based on pesticide data.

** There were no VOC detections that exceeded SLs; no soil was classified as Type 2 based on VOC data.

PORT ANGELES HARBOR

Fuel Oil Tanks 1 and 2 Area

Log Yard

Main Process Area

Chlorine Dioxide Generator

Primary Clarifier

Pre-Fab Area

Ennis Creek

Storage Tank Stair Tower

Secondary Treatment

CSO Return Pump Station

Drainage Ditch

BLUFF

Equipment Storage Area

Effluent Diversion Structure

Influent Diversion Structure

MW-55 MW-51 PZ-3 MW-56 MW-54 TP-01 TP-02 TP-20 MW-66 GWG-3 MW-62 TP-03 SSB-7 MW-57 MW-53 GWG-2 GWG-4 PZ-2 SSB-6 MW-58 MW-67 TP-18 TP-12 TP-05 TP-19 TP-13 GWG-5A MW-29 TP-04 MW-23 TP-11 SSB-1 MW-65 SSB-5 PIPE-1-SR23 GWG-5 MW-28 MW-63 SSB-2 TP-06 PZ-4 SSB-3 GWG-1 MW-61 GWG-9 MW-68 TP-17 TP-16 MW-60 TP-14 MW-52 SSB-8 SSB-4 PA-13 TP-07 TP-15 TP-21 TP-10 PA-16 PA-24 PA-14 TP-09 PA-1 TP-08 PA-15 MW-69 PA-17 PA-25 PA-18 PZ-9 MW-70 GWG-7 GWG-6 PZ-5 PA-19 MW-59 GWG-8 PZ-10 SSB-9 PZ-7 B-103 PA-20 PZ-6 TP-4 SW-5 SSB-10 PA-2 FAR-11 PZ-11 B-114 B-108 PA-21 PZ-12 PA-22 B-118 FAR-16 B-13 PA-23

TP-2 TP-3

300-C-003 200-C-004 300-C-004 300-C-007 400-C-001 400-C-002 400-C-003 700-C-003 400-C-004 700-C-001 400-C-005 700-C-002 400-C-006 500-C-001

Supplemental Upland Investigation (SUI) Groundwater Grab Sample

SUI Soil Boring

SUI Monitoring Well

Monitoring Well Installed Prior To or After SUI

SUI Test Pit

SUI Pipe Contents Sample

Soil Sample(s) Collected Prior To or After SUI

CSO Soil Boring (2009)

CSO Test Pit

Previous Geotechnical Boring

Abandoned Rayonier Pipe

CSO Project Phase I Pipe

CSO Construction Easement

CSO Structures

300-C-004 City Phase I CSO Project Drawing Number

City Purchase - Lots 1 and 2

City Easements - Existing and New

N W E S

100 0 100

Feet

Known Soil Types at Sampling Locations Along CSO Alignment

Type 1 Soil, 0-2 feet bgs

Type 1 Soil, >2 feet bgs

Type 2A Soil, 0-2 feet bgs

Type 2A Soil, >2 feet bgs

Type 2B Soil, 0-2 feet bgs

Type 2B Soil, >2 feet bgs

Anticipated Soil Types Along CSO Alignment

Type 1 Soil, 0-2 feet bgs

Type 1 Soil

Type 2A Soil

Type 2B Soil

Interim Action Areas & Material Quantities Removed

Finishing Room - 10,150 tons soil (hydraulic oil/PCBs; 1993, 1998, 2002)

Fuel Tank No. 2 - 5,400 tons soil (Bunker C; 1993, 2002)

Hog Fuel Pile - 2,700 cy wood residue (diesel & heavy oil; 2001)

Machine Shop - 970 tons soil (diesel & heavy oil; 2002)

SSL Lagoon - 4,800 tons soil (arsenic; 2001)

Wood Mill & Fuel Tank No.1 - 7,980 tons soil (hydraulic oil & Bunker C; 2006)

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

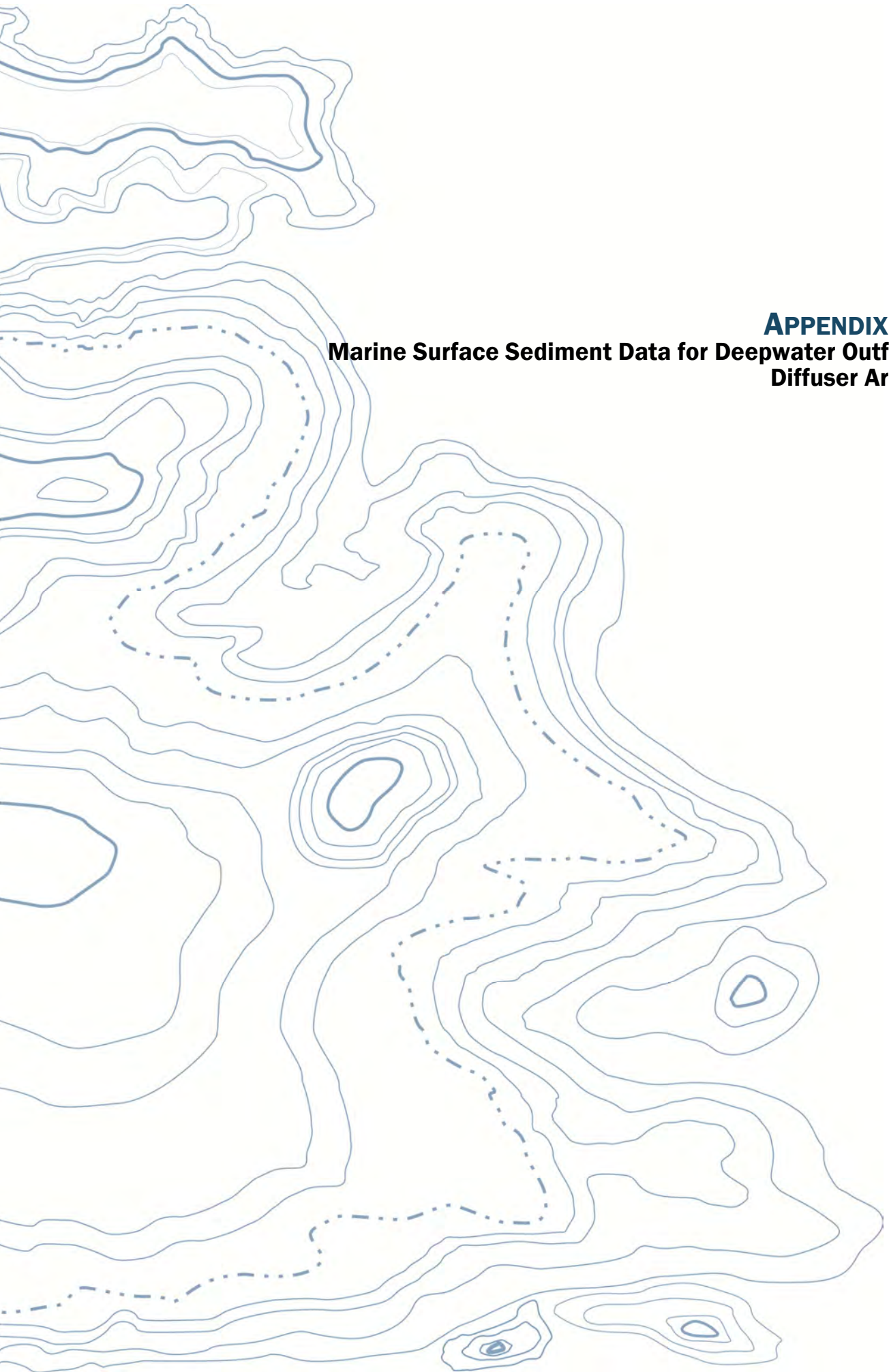
Office: Seattle Path: \\Sea\projects\0\01370\15\GIS\01370150 3_F1_CSOPipelineSoilEvaluation.mxd Modified: May 15, 2012 CRC

CSO Pipeline Alignment Soil Evaluation

Port Angeles Rayonier Mill Study Area
Port Angeles, Washington

GeoEngineers

Figure 1



APPENDIX B
Marine Surface Sediment Data for Deepwater Outfall Diffuser Area

TABLE B-1

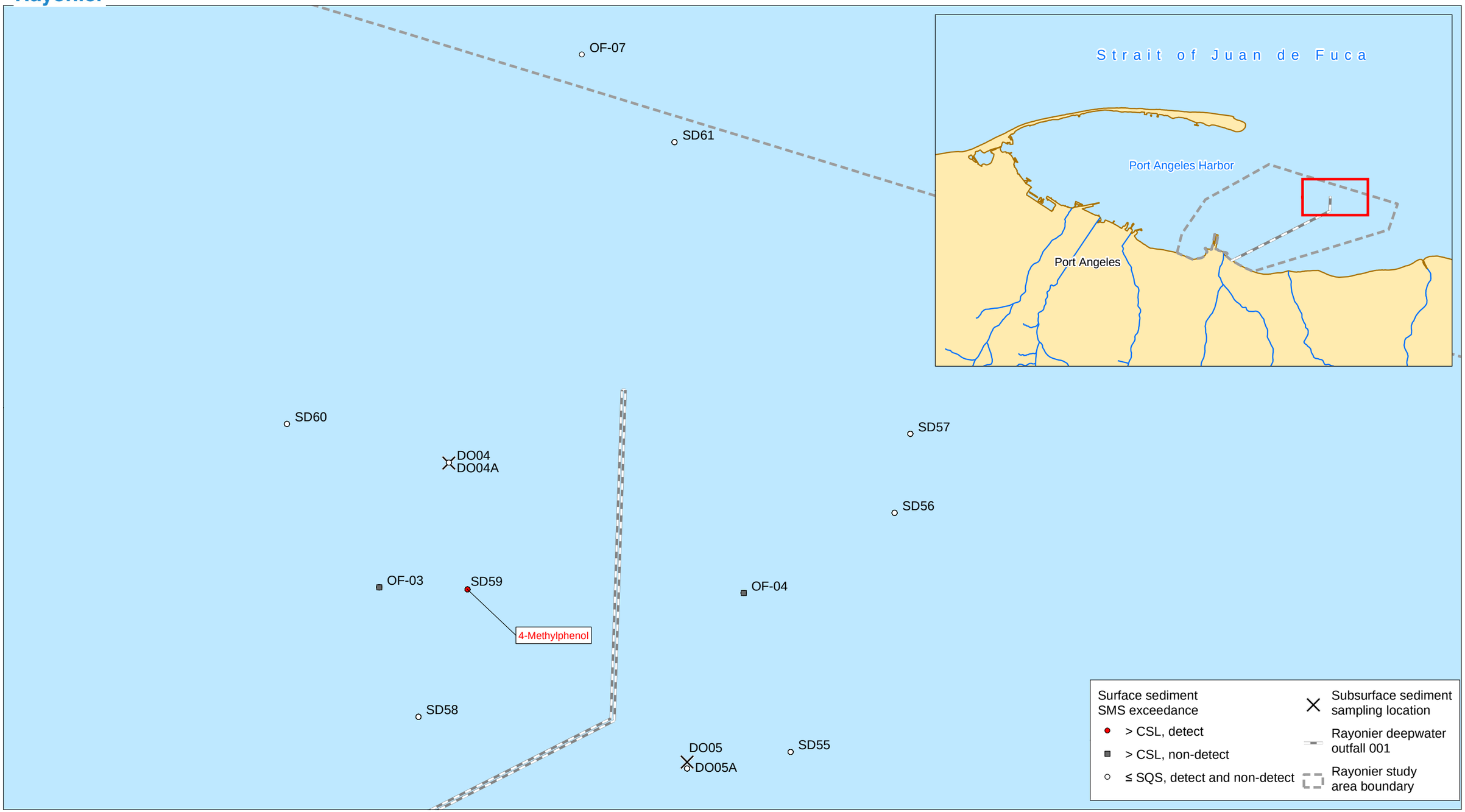
Chemistry Analytical Results for Marine Surface Sediments in Deepwater Outfall Diffuser Area

Port Angeles Rayonier Mill Study Area

Port Angeles, Washington

Chemical	Event	Location	Sample	Sample Date	Upper Depth	Lower Depth	Depth Unit	Value	Unit	Basis	Detected	X	Y	Coordinate Type
Arsenic	PA Harbor Ecology 08	DO04A	DO04A	6/19/2008	0	10	cm	3.2	mg/kg	Dry	Yes	1018570	421504	WA-N NAD83
	PA Harbor Ecology 08	DO05A	DO05A	6/19/2008	0	10	cm	3.2	mg/kg	Dry	Yes	1019250	420633	WA-N NAD83
	RayPA RI 2002 Sed	OF-03	OF-03-SS	8/20/2002	0	10	cm	2.6	mg/kg	Dry	Yes	1018371	421149	WA-N NAD83
	RayPA RI 2002 Sed	OF-04	OF-04-SS	8/20/2002	0	10	cm	2.43	mg/kg	Dry	Yes	1019411	421133	WA-N NAD83
	Rayonier EPA ESI 97	SD55	SD55	12/5/1997	1	10	cm	3.7	mg/kg	Dry	Yes	1019545	420680	WA-N NAD83
	Rayonier EPA ESI 97	SD56	SD56	12/6/1997	1	10	cm	5.5	mg/kg	Dry	Yes	1019842	421361	WA-N NAD83
	Rayonier EPA ESI 97	SD57	SD57	12/6/1997	1	10	cm	4.6	mg/kg	Dry	Yes	1019887	421586	WA-N NAD83
	Rayonier EPA ESI 97	SD58	SD58	12/6/1997	1	10	cm	6.4	mg/kg	Dry	Yes	1018483	420780	WA-N NAD83
	Rayonier EPA ESI 97	SD59	SD59	12/6/1997	1	10	cm	4.2 U	mg/kg	Dry	No	1018623	421143	WA-N NAD83
	Rayonier EPA ESI 97	SD60	SD60	12/5/1997	1	10	cm	3.3	mg/kg	Dry	Yes	1018108	421614	WA-N NAD83
	Rayonier EPA ESI 97	SD61	SD61	12/6/1997	1	10	cm	3.9	mg/kg	Dry	Yes	1019214	422417	WA-N NAD83
cPAHs 2005 - mammal (half DL)	PA Harbor Ecology 08	DO04A	DO04A	6/19/2008	0	10	cm	6.20 U	ug/kg	Dry	No	1018570	421504	WA-N NAD83
	PA Harbor Ecology 08	DO05A	DO05A	6/19/2008	0	10	cm	6.20 U	ug/kg	Dry	No	1019250	420633	WA-N NAD83
	RayPA RI 2002 Sed	OF-03	OF-03-SS	8/20/2002	0	10	cm	5.30 J	ug/kg	Dry	Yes	1018371	421149	WA-N NAD83
	RayPA RI 2002 Sed	OF-04	OF-04-SS	8/20/2002	0	10	cm	6.20 J	ug/kg	Dry	Yes	1019411	421133	WA-N NAD83
	Rayonier EPA ESI 97	SD55	SD55	12/5/1997	1	10	cm	12.5 U	ug/kg	Dry	No	1019545	420680	WA-N NAD83
	Rayonier EPA ESI 97	SD56	SD56	12/6/1997	1	10	cm	12.1 U	ug/kg	Dry	No	1019842	421361	WA-N NAD83
	Rayonier EPA ESI 97	SD57	SD57	12/6/1997	1	10	cm	12.1 U	ug/kg	Dry	No	1019887	421586	WA-N NAD83
	Rayonier EPA ESI 97	SD58	SD58	12/6/1997	1	10	cm	11.6 U	ug/kg	Dry	No	1018483	420780	WA-N NAD83
	Rayonier EPA ESI 97	SD59	SD59	12/6/1997	1	10	cm	12.2 U	ug/kg	Dry	No	1018623	421143	WA-N NAD83
	Rayonier EPA ESI 97	SD60	SD60	12/5/1997	1	10	cm	12.2 U	ug/kg	Dry	No	1018108	421614	WA-N NAD83
	Rayonier EPA ESI 97	SD61	SD61	12/6/1997	1	10	cm	13.2 U	ug/kg	Dry	No	1019214	422417	WA-N NAD83
Dioxin/furan TEQ - mammal (half DL)	PA Harbor Ecology 08	DO04A	DO04A	6/19/2008	0	10	cm	1.70 J	ng/kg	Dry	Yes	1018570	421504	WA-N NAD83
	PA Harbor Ecology 08	DO05A	DO05A	6/19/2008	0	10	cm	1.40 J	ng/kg	Dry	Yes	1019250	420633	WA-N NAD83
Total PCBs	RayPA RI 2002 Sed	OF-03	OF-03-SS	8/20/2002	0	10	cm	14 U	ug/kg	Dry	No	1018371	421149	WA-N NAD83
	RayPA RI 2002 Sed	OF-04	OF-04-SS	8/20/2002	0	10	cm	14 U	ug/kg	Dry	No	1019411	421133	WA-N NAD83
	RayPA RI 2002 Sed	OF-07	OF-07-SS	8/20/2002	0	10	cm	13 U	ug/kg	Dry	No	1018949	422667	WA-N NAD83
	Rayonier EPA ESI 97	SD55	SD55	12/5/1997	1	10	cm	21 U	ug/kg	Dry	No	1019545	420680	WA-N NAD83
	Rayonier EPA ESI 97	SD56	SD56	12/6/1997	1	10	cm	20 U	ug/kg	Dry	No	1019842	421361	WA-N NAD83
	Rayonier EPA ESI 97	SD57	SD57	12/6/1997	1	10	cm	20 U	ug/kg	Dry	No	1019887	421586	WA-N NAD83
	Rayonier EPA ESI 97	SD58	SD58	12/6/1997	1	10	cm	19 U	ug/kg	Dry	No	1018483	420780	WA-N NAD83
	Rayonier EPA ESI 97	SD59	SD59	12/6/1997	1	10	cm	20 U	ug/kg	Dry	No	1018623	421143	WA-N NAD83
	Rayonier EPA ESI 97	SD60	SD60	12/5/1997	1	10	cm	20 U	ug/kg	Dry	No	1018108	421614	WA-N NAD83
	Rayonier EPA ESI 97	SD61	SD61	12/6/1997	1	10	cm	22 U	ug/kg	Dry	No	1019214	422417	WA-N NAD83
Total organic carbon (TOC)	PA Harbor Ecology 08	DO04A	DO04A	6/19/2008	0	10	cm	0.438	%	Dry	Yes	1018570	421504	WA-N NAD83
	PA Harbor Ecology 08	DO05A	DO05A	6/19/2008	0	10	cm	0.495	%	Dry	Yes	1019250	420633	WA-N NAD83
	RayPA RI 2002 Sed	OF-03	OF-03-SS	8/20/2002	0	10	cm	0.63	%	Dry	Yes	1018371	421149	WA-N NAD83
	RayPA RI 2002 Sed	OF-04	OF-04-SS	8/20/2002	0	10	cm	0.64	%	Dry	Yes	1019411	421133	WA-N NAD83
	RayPA RI 2002 Sed	OF-07	OF-07-SS	8/20/2002	0	10	cm	0.57	%	Dry	Yes	1018949	422667	WA-N NAD83
	Rayonier EPA ESI 97	SD55	SD55	12/5/1997	1	10	cm	0.521	%	Dry	Yes	1019545	420680	WA-N NAD83
	Rayonier EPA ESI 97	SD56	SD56	12/6/1997	1	10	cm	0.711	%	Dry	Yes	1019842	421361	WA-N NAD83
	Rayonier EPA ESI 97	SD57	SD57	12/6/1997	1	10	cm	0.437	%	Dry	Yes	1019887	421586	WA-N NAD83
	Rayonier EPA ESI 97	SD58	SD58	12/6/1997	1	10	cm	0.481	%	Dry	Yes	1018483	420780	WA-N NAD83
	Rayonier EPA ESI 97	SD59	SD59	12/6/1997	1	10	cm	0.722	%	Dry	Yes	1018623	421143	WA-N NAD83
	Rayonier EPA ESI 97	SD60	SD60	12/5/1997	1	10	cm	0.596	%	Dry	Yes	1018108	421614	WA-N NAD83
	Rayonier EPA ESI 97	SD61	SD61	12/6/1997	1	10	cm	0.525	%	Dry	Yes	1019214	422417	WA-N NAD83

Rayonier

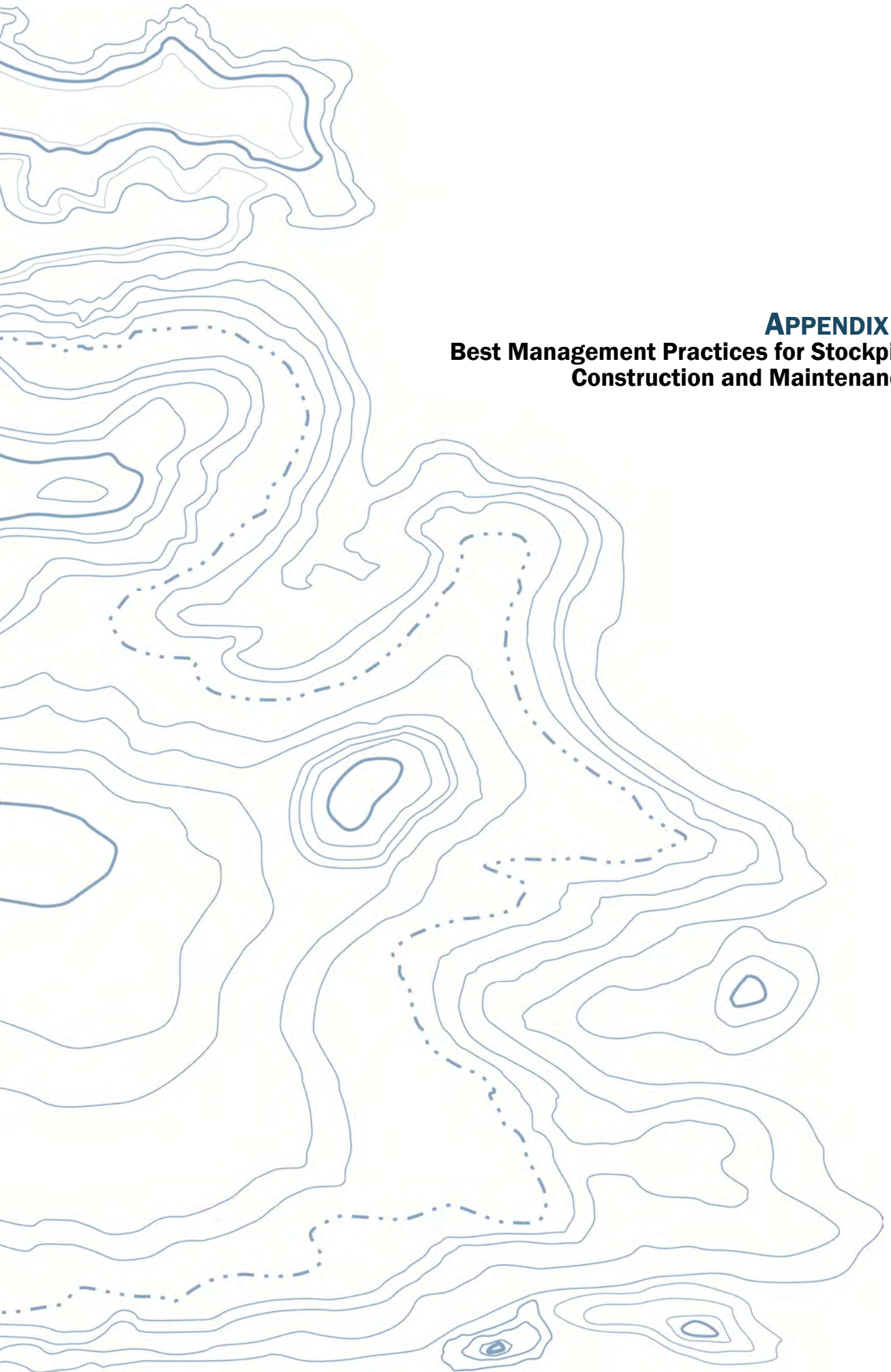


WindWard environmental LLC

Privileged attorney-client communication
Prepared in anticipation of litigation and trial

Figure B-1. Surface sediment SMS exceedances based on chemistry and subsurface sediment sampling locations for area near Rayonier deepwater outfall 001

Prepared by MTY, 05/09/12, map#5017b; W:\Projects\Rayonier PA Volume II\Data\GIS\Maps_and_Analysis



APPENDIX C
Best Management Practices for Stockpile Construction and Maintenance

Section 5.0 below provides Best Management Practices (BMPs) for storage of soil at the Rayonier Mill Property located at 700 North Ennis, Port Angeles, WA. Section 5.0 is included as part of the following two separate documents:

- Section 5.0 of Rayonier's Industrial Stormwater General Permit (No: WAR003611) Stormwater Pollution Prevention Plan (Rayonier's Industrial SWPPP) (Landau Associates, revised April 20, 2012)

- Appendix C of Rayonier's Final Materials Management Plan (GeoEngineers, July 17, 2012).

5.0 BMPS FOR TEMPORARY INDUSTRIAL ACTIVITIES

The format of this section is consistent with the BMPs of section 3 of Rayonier's Industrial SWPPP in that general required BMPs are presented in italics followed by the specific application of these BMPs at the Mill. However, due to the temporary nature of some industrial activities performed at the site, these BMPs are presented as a separate section (Section 5.0) within the Rayonier Industrial SWPPP.

5.1 CITY OF PORT ANGELES CSO PROJECT - SOIL STAGING BMPS

5.1.1 BEST MANAGEMENT FOR STORAGE OR TRANSFER (OUTSIDE) OF SOLID RAW MATERIALS, BY-PRODUCTS, OR FINISHED PRODUCTS

Volume IV of the 2005 Stormwater Management Manual for Western Washington (2005 Manual) requires operational, structural, and treatment BMPs for Storage or Transfer (Outside) of Solid Raw Materials, which are described in subsections 5.1.1.1, through 5.1.1.3 below. A brief description of pollutant sources associated with this industrial activity as well as the applicability of this activity at the Facility are also provided below.

> ***General Description of Pollutant Sources:*** *Solid raw materials, by-products, or products such as gravel, sand, salts, topsoil, compost, logs, sawdust, wood chips, lumber and other building materials, concrete, and metal products sometimes are typically stored outside in large piles, stacks, etc. at commercial or industrial establishments. Contact of outside bulk materials with stormwater can cause leachate, and erosion of the stored materials. Contaminants include TSS, BOD, organics, and dissolved salts (sodium, calcium, and magnesium chloride, etc).*

- **Applicability at the Facility**: As described in Section 2.1 of Rayonier's Industrial SWPPP, the former Mill site is an inactive Facility (Facility). However, because part of Rayonier property is located within a City of Port Angeles temporary construction project (CSO Project), Facility property will be used for temporary storage of soil. In accordance with section S1.D.6 of the Permit, all construction activity associated with the CSO project will be managed separately by the City under a separate NPDES construction stormwater permit. Because Rayonier property is located within the CSO project, the City's construction stormwater permit will manage an area that will include both City property and Rayonier property. Soil from the CSO construction project that is not visibly contaminated will be moved to separate sections of Rayonier property outside of the construction stormwater permit boundary limits onto Rayonier property where it will be stored. Soil storage will be managed separately by Rayonier under Rayonier's Industrial SWPPP. Under Rayonier's Industrial SWPPP, management of the soil will be limited to soil storage. BMPs to manage storage of the soil stockpiles are listed below. See Rayonier's Industrial SWPPP Figure 2 for the overall site map and see Rayonier's Industrial SWPPP Figure 3 for soil stockpile details.

5.1.1.1 Operational Best Management Practices for Storage or Transfer (Outside) of Solid Raw Materials, By-Products, or Finished Products

The following operational BMP from the 2005 Manual for storage or transfer (outside) of solid raw materials, by-products, or finished products is required and is adhered to at the Facility, unless noted otherwise:

- *Do not hose down the contained stockpile area to a storm drain or a conveyance to a storm drain or to a receiving water.*
  - **Plastic Sheeting:** The stockpile areas are covered with plastic sheeting. Stormwater runoff from covered piles infiltrates into surrounding soil and designated areas. Each stockpile also has plastic sheeting underneath (excluding impervious areas) to act as a visual/physical separation barrier between the stockpiled soil and underlying soils. As required, a two-inch soil layer will be placed under the bottom plastic sheeting (excluding impervious areas) to provide a flat and smooth surface. See Rayonier's Industrial SWPPP Figure 2 for the overall site map and see Rayonier's Industrial SWPPP Figure 3 for soil stockpile details.

5.1.1.2 Structural Best Management Practices for Storage or Transfer (Outside) of Solid Raw Materials, By-Products, or Finished Products

The following structural BMPs from the 2005 Manual for storage or transfer (outside) of solid raw materials, by-products, or finished products are required and are adhered to at the Facility, unless noted otherwise:

At least one of the following Structural Source Control BMPs for the storage of raw material stockpiles of 5 cubic yards or more are required by the Permit:

- *Store in a building or paved and bermed covered area. Place temporary plastic sheeting (polyethylene, polypropylene, hypalon, or equivalent) over the material. Pave the area and install a stormwater drainage system. Place curbs or berms along the perimeter of the area to prevent the run-on of uncontaminated stormwater and to collect and convey runoff to treatment. Slope the paved area in a manner that minimizes the contact between stormwater (e.g., pooling) and leachable materials in compost, logs, bark, wood chips, etc. For large stockpiles that cannot be covered, implement containment practices at the perimeter of the site and at any catch basins as needed to prevent erosion and discharge of the stockpiled material offsite or to a storm drain. Ensure that contaminated stormwater is not discharged directly to catch basins without conveying through a treatment BMP.*

  - **Sheeting**: See Coverings in Section 5.1.1.1.

  - **Drainage System**: A drainage system with conveyance trenches is used to collect, infiltrate, and convey stormwater runoff from the plastic covered storage stockpiles to the designated infiltration areas. See Rayonier's Industrial SWPPP Figure 2 for the overall site map and see Rayonier's Industrial SWPPP Figure 3 for soil stockpile details.

5.1.1.3 Treatment Best Management Practices for Storage or Transfer (Outside) of Solid Raw Materials, By-Products, or Finished Products

The following treatment BMP from the 2005 Manual for storage or transfer (outside) of solid raw materials, by-products, or finished products is required and is adhered to at the Facility, unless noted otherwise:

- *Convey contaminated stormwater from the stockpile area to a wet pond, wet vault, settling basin, media filter, or other appropriate treatment system depending on the contamination.*

  - **Stormwater Runoff**: Soil stockpiles are covered with plastic sheeting to prevent stormwater runoff from being contaminated. See Drainage System in section 5.1.1.2.

The following additional BMPs from the 2005 Manual are not required, but are recommended**:**

- *Maintain drainage areas in and around storage of solid materials with a minimum slope of 1.5 percent to prevent pooling and minimize leachate formation. Areas should be sloped to drain stormwater to the perimeter where it can be collected, or to internal drainage "alleyways" where material is not stockpiled. Sweep paved storage areas regularly for collection and disposal of loose solid materials. If and when feasible, collect and recycle water-soluble materials (leachates) to the stockpile. Stock cleanup materials, such as brooms, dustpans, and vacuum sweepers near the storage area.*

  - **Drainage Areas**: See Drainage System in section 5.1.1.2.

N

Stormwater Discharges to Harbor

Stormwater Infiltrates into Ground Between Concrete Pads

Unused Grassy Area

Stormwater Infiltration to Ground

Stockpile Area 1 (See Figure 3 for Details

Stockpile Area 2 (See Figure 3 for Details)

Stormwater Sampling and Outfall Location 003

Stormwater Infiltration to Ground

Potential Stockpile Area 3 (See Figure 3 for Details)

Stormwater Infiltration to Ground

Stormwater Infiltration to Ground

Open Culvert

POTW

W.F. Trail

Olympic Discovery Trail

Race St.

Columbia/Water Alley

Water St.

Columbia St.

Ennis St.

Chambers St.

Washington St.

Caroline St.

Caroline/Georgiana Alley

Georgiana St.

Jones St.

Liberty St.

Caroline/Columbia Alley

Ennis Creek

Olympic Discovery Trail

Harborcrest Pl.

Chestnut St.

Beech St.

Third St.

Bourchier St.

Legend

- CSO Construction Easement
- Stockpiles
- Paved Areas
- City Owned Property
- Underground Stormwater Conveyance
- Stormwater Sheet Flow
- Catch Basin
- Stormwater Flow Direction

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Source: Bing Imagery; City of Port Angeles GIS

0 350 700

Scale in Feet

LANDAU ASSOCIATES

Rayonier Properties Inc.
Former Mill Site
Port Angeles, Washington

Site Map

Figure 2

Y:\Projects\016041010.017\MapDocs\Fig2-SiteMap_Landscape.mxd 4/26/2012 NAD 1983 StatePlane Washington North FIPS 4601 Feet

N

NOTES:

1. INFILTRATION AREAS WILL BE SIZED BASED ON ACTUAL SOILS/MATERIALS, TOPOGRAPHY, AND OBSERVED INFILTRATION CONDITIONS.
2. COLLECTION/INFILTRATION/CONVEYANCE TRENCHES WILL BE AT LEAST TRIANGULAR WITH 2:1 SIDE SLOPES AND 1 TO 2 FEET DEEP.
3. THE CONVEYANCE CULVERT UNDER THE ACCESS ROAD WILL BE AT LEAST A 12" DIAMETER CULVERT.
4. ACCESS ROADS WILL BE EXISTING IMPERVIOUS PAVEMENT, RECYCLED CONCRETE RUBBLE (WITHOUT REBAR AND METAL DEBRIS), AND OR QUARRY SPALLS. ACTUAL TIE-IN LOCATIONS TO EXISTING ROADS WILL BE DETERMINED IN THE FIELD.
5. SOIL STOCKPILE AREAS WILL BE BUILT UP PER THE ATTACHED STOCKPILE DETAIL SKETCH. STOCKPILES ARE TYPICALLY ABOUT 70' WIDE X 120' LONG X 8' TALL.
6. VISUALLY CONTAMINATED SOILS WILL BE PLACED DIRECTLY INTO ROLL-OFF CONTAINERS. THESE MOBILE CONTAINERS WILL HAVE SECONDARY CONTAINMENT AROUND THEM DURING FILLING.

COLLECTION/INFILTRATION/ CONVEYANCE TRENCH(TYP)

~200' SHORELINE SETBACK

SOIL STOCKPILE AREA (~2,000 CY)(TYP)

~100' STREAM SETBACK

INFILTRATION AREA

TRAFFIC FLOW

INFILTRATION AREA

ACCESS ROAD

PHYSICAL BARRIER (EARTHEN BERM, FENCING, ETC.) (TYP)

TRAFFIC FLOW

~100' STREAM SETBACK

SOIL STOCKPILE AREA (~2,000 CY)(TYP)

~200' SHORELINE SETBACK

COLLECTION/INFILTRATION/ CONVEYANCE TRENCH(TYP)

APPROXIMATE CSO CONSTRUCTION LIMITS BY OTHERS (TYP)

TRAFFIC FLOW

CONVEYANCE CULVERT UNDER ACCESS ROAD

INFILTRATION AREA

ACCESS ROAD

EXISTING WELL HEAD TO BE PROTECTED

TRAFFIC FLOW

PHYSICAL BARRIER (EARTHEN BERM, FENCING, ETC.) (TYP)

APPROXIMATE CSO CONSTRUCTION LIMITS BY OTHERS (TYP)

LANDAU ASSOCIATES, INC. | V:\1600\042\010.013\Figure 1.dwg (A) "11x17h" 3/31/2012

LANDAU ASSOCIATES

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 200 400

Scale in Feet

Rayonier Properties Inc.
Former Mill Site
Port Angeles, Washington

Proposed
Product Staging / Storage Area

Figure
3

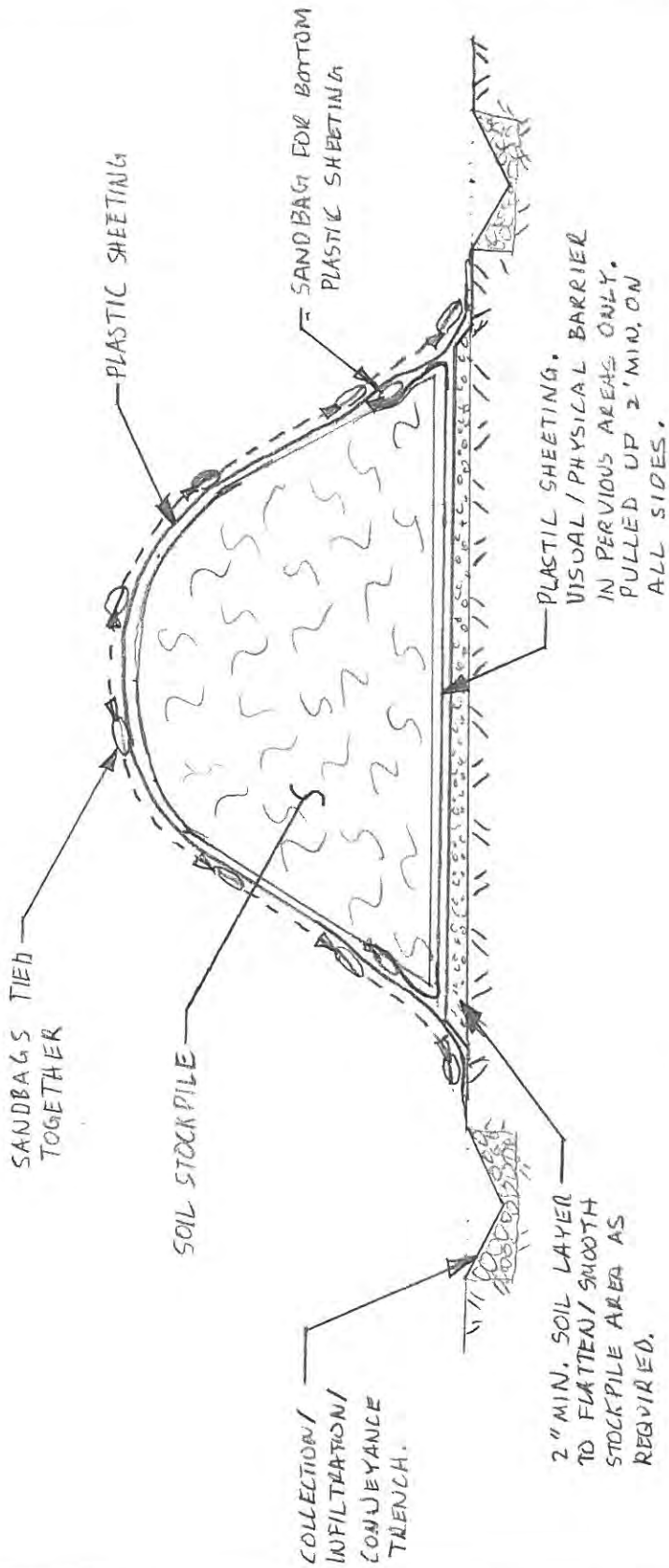
Note

Base map source: Goggle Earth

LANDAU ASSOCIATES

By RLZ Date 04/26 Project Rayonier Properties Inc. Project No. 16042.010.013

Checked By _____ Date _____ Subject Former Mill Site Stockpile Detail Sheet 1 of 1



TYPICAL SOIL STOCK PILE
N.T.S.

Have we delivered World Class Client Service?
Please let us know by visiting **www. geoengineers.com/feedback**.

GeoEngineers