



*Removal Action Completion Report  
Pier 99 – Portland Site  
Portland, Oregon*

Prepared for:  
Mr. Milton Brown, Vancouver, Washington

November 13, 2014  
1975-01

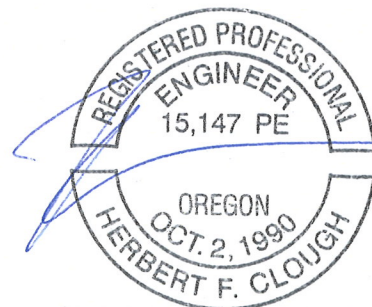


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EXPIRES: DEC. 31, 2015

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## ***Table of Contents***

1.0 INTRODUCTION .....	1
1.1 Purpose .....	1
1.2 Scope of Work .....	1
2.0 BACKGROUND .....	2
2.1 Site Location and Description .....	2
2.2 Hydrogeology and River Stage Characteristics .....	3
2.3 Removal Action Objectives .....	3
2.4 Removal Action Areas .....	4
2.5 Removal Levels .....	4
3.0 REMOVAL ACTION ACTIVITIES .....	4
3.1 Preparatory Activities .....	7
3.2 OU3 – Gravel Filter .....	10
3.3 OU1 Bank Stabilization .....	13
4.0 SAMPLING RESULTS .....	19
4.1 Laboratory Analytical Plan .....	20
4.2 Confirmation Sampling Results .....	21
5.0 WASTE AND DEBRIS DISPOSAL AND RECYCLING .....	23
6.0 ONGOING EROSION CONTROLS AND INSPECTIONS .....	24
7.0 PROJECT ORGANIZATION, COST AND SCHEDULE .....	25
7.1 Key Organizations and Roles .....	25
7.2 Project Costs .....	26
8.0 SUMMARY AND CONCLUSIONS .....	26
9.0 REFERENCES .....	28

## **Tables**

1	Soil Sample Results – Metals
2	Soil Sample Results – Butyltins and PCBs
3	Soil Sample Results – Organochlorine Pesticides
4	Soil Results: Metals and SVOCs

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## Figures

- 1 Site Location Map
- 2 Site Vicinity Plan
- 3 Removal Action Summary
- 4 Soil Results: Metals and TBT
- 5 Soil Results: Pesticides, PCBs, and B(a)P
- 6 Removal Action Areas Exceeding RML

## Appendices

- A Project Drawings and Specifications and Compaction Testing Results
- B Photograph Log
- C Field Notes
- D Disposal Documentation
- E Correspondence
- F Laboratory Reports

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## **1.0 Introduction**

### **1.1 Purpose**

This Removal Action Completion Report (Report) has been prepared for the 1610 North Pier 99 Site – Pier West site located at 1610 North Pier 99 Street, in Portland, Oregon (the Site; Figure 1). The Report documents the implementation of the Removal Action Work Plan (Apex Companies, LLC [Apex], 2013d) that was developed following the Engineering Evaluation/Cost Analysis (EE/CA; Apex, 2013b) and the U.S. Environmental Protection Agency (EPA) Removal Action Decision Memorandum (EPA, 2013). The Removal Action focused on the Bank Area (Operable Unit [OU] 1) and the Gravel Filter Area (OU3). The removal action included:

- OU1 Bank Stabilization: Included clearing of unwanted invasive species, removing debris, limited contaminated soil removal, bank stabilization, and re-vegetation.
- OU3, Gravel Filter Area: Included removal of the Gravel Filter and backfilling, cleaning and removing the discharge line from the gravel filter to the river bank, and removing contaminated soil at the outfall.

Additionally, subsequent to the primary mobilization for the removal action in 2013, additional removal was completed at a portion of the site. The additional removal was completed in accordance with the Proposed Additional Focused Removal Activities work plan dated May 27, 2014.

This Report was prepared pursuant to an Administrative Settlement Agreement and Order on Consent (AOC) dated September 9, 2013 between the EPA and the property owner, Mr. Milton Brown. Figure 1 presents a Site location map; Figure 2 presents a Site vicinity plan; Figure 3 summarizes the removal action.

### **1.2 Scope of Work**

For the Removal Action, Apex completed the following general tasks:

- Preparing the Site, including implementation and maintenance of erosion control measures;
- Excavating the Gravel Filter Area and completing removal confirmation sampling;
- Completing a limited excavation and removal confirmation sampling at the end of the Gravel Filter discharge pipe;
- Transporting and disposing excavated soils and gravel filter material, and waste water generated during the project;
- Cleaning the Gravel Filter discharge pipe of sediment and disposing of the collected material and removing the pipe by excavation;

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- Clearing existing vegetation from the bank, along with grubbing and grading the bank;
  - Stabilization with jute netting and re-vegetation using an approved grass species consistent with Peninsula 1 Drainage District (PEN) 1 specifications;
  - Removing miscellaneous surface debris, a former burn area, and a former tank from the bank;
  - Completing focused additional removal of contaminated soil from the beneath the former burn area;
  - Conducting environmental oversight during the removal activities; and
  - Reporting.

These activities are discussed in further detail within this Report.

## **2.0 Background**

This section provides background information on the Site relevant to the removal action. A detailed description of the site history and prior environmental investigations can be found in the EE/CA (Apex, 2013b).

### **2.1 Site Location and Description**

The Site is located in Portland, Oregon (as shown on Figure 1). The property is a 1.07-acre parcel that is roughly rectangular, located along the western edge of the Interstate Highway (I-5) bridge over North Portland Harbor – Columbia River. North Portland Harbor – Columbia River is the name given to the portion of the Columbia River that runs between Hayden Island and North Portland. The entire Site is located on a levee that is under the jurisdiction of the United States Army Corps of Engineers (USACE) and managed by PEN 1. The riverward boundary between the Site and submerged lands owned by the Oregon Division of State Lands (DSL) is defined as the ordinary high water line (OHWL).

Figure 2 shows the Site vicinity plan. The property is bounded by the Northwest Boat Center and the I-5 Bridge to the east, the North Portland Harbor – Columbia River to the north, Pier 99 moorage and Diversified Marine to the west, and a parking area to the south. Current site uses include residential uses of the house at the west side of the property and general shop and storage uses in the work shop. Current in-water uses adjacent to the site include moorage of marine vessels, house boats, and pleasure craft.

Two sets of stairs/walkways lead from the top of the bank on the property down to the docks. Figure 3 shows the Site features. Located at the top of the western walkway is a residence. Located at the top of the eastern walkway are the shop building, a driveway, a shed, and paved area currently used for parking.

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## 2.2 Hydrogeology and River Stage Characteristics

The geology beneath the site consists of fill used to construct the levee, which is expected to be underlain by overbank deposits from the Columbia River and remaining geologic units that comprise the Portland Basin. The local bedrock is the Columbia River Basalt. The depth to bedrock in the vicinity of the Site was not mapped in publications reviewed for the EE/CA, but it is expected to occur at depths of 1,000 feet or greater.

Depth to groundwater at the Site is controlled by the river stage. During the 2013 Data Gap Investigation, groundwater was encountered at approximately 20 feet below the ground surface (bgs).

PEN 1 required that Removal Action at the site be completed during periods of low water within the Columbia River. This commonly corresponds to a work window of August to early October. PEN 1 defines the low water work period when the river stage is 7 feet or lower at the Vancouver gauging station.

The Site is located at approximately Columbia River Mile 106. At this location, the OHWL is 17.6 feet, measured to the National Geodetic Vertical Datum (NGVD) of 1929 (USACE, 2004).

## 2.3 Removal Action Objectives

Removal action objectives (RAOs) were developed to address pathways that pose imminent threats by removing site contaminants or minimizing potential for site contaminants to migrate to the river. The RAOs are site-specific goals for protecting human health and the environment established on the basis of the nature and extent of the contamination, resources that are currently and potentially threatened, and the potential for human and environmental exposure. The RAOs specify the contaminants of concern, potential exposure routes and receptors, and acceptable contaminant concentrations (or range of acceptable contaminant concentrations for each exposure route).

The RAOs include:

- Prevent direct contact by workers (industrial, excavation, and construction) to contaminated soil in excess of EPA's Removal Management Levels (RMLs); and
- Prevent migration of contaminated soils to the North Portland Harbor – Columbia River.

Secondary removal action objectives were implemented for the gravel filter area. Since contaminants of concern have not migrated significantly from the gravel filter area, excavation to attain RMLs also would likely remove soils to concentrations below the EPA Regional Screening Levels for industrial soil. In this manner, excavation of the Gravel Filter was focused on both achieving EPA's short-term removal action requirement, and permanent cleanup levels that account for long term exposure.

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## 2.4 Removal Action Areas

Removal Action Areas (RAA) are portions of the Site where contaminants of concern are present in excess of RMLs. These areas include:

- Operable Unit 1 – Bank Area; and
- Operable Unit 3 – Gravel Filter Area and Upland Boat Maintenance Repair Area.

The stabilization area for the Bank Area – Operable Unit 1 is shown on Figure 3. It includes approximately 250 feet of river frontage extending from the western elevated walkway by the residence to the eastern side of the gravel filter.

The removal area for the Gravel Filter Area – Operable Unit 3 is shown on Figure 3. It includes the approximately 125 foot long gravel filter, the 8-inch concrete and corrugated metal discharge pipe, the perforated gravel filter inlet pipe, and the manhole. As a component of the gravel filter removal action (OU3), contaminated soil excavation was completed to remove contaminated soil at the end of the gravel filter discharge pipe.

Additionally, as shown on Figure 3, historical sample location WS02SS was believed to be located within the area of the outfall to the gravel filter, and was planned to be excavated with those soils. The outfall pipe was believed to trend straight from the manhole, which would have placed it on a path to intersect with area represented by WS02SS (see Figure 3). Sample location WS02SS was the only sample location within the Eastern Unimproved Area (OU2) located offsite that had concentrations of contaminants of concern in excess of RMLs. Since the outfall was found in a different location, GPS coordinates were used to establish the location of historical sample WS02SS and the associated removal area.

## 2.5 Removal Levels

EPA RMLs for industrial exposures were used as the basis for deciding whether additional excavation was required in the removal areas following confirmation sampling. EPA RMLs correspond to  $10^{-4}$  excess human health risks and an HQ of 3 for non-carcinogenic effects.

Secondary cleanup criteria that were applied to the Gravel Filter excavation include EPA Industrial Regional Screening Levels (RSLs). The RSLs are based on target human health risk levels of  $10^{-6}$  excess cancer risk for individual carcinogenic compounds and a hazard index of 1 for non-carcinogenic compounds.

## **3.0 Removal Action Activities**

This section describes the implementation of the Removal Action, including site preparation, soil excavation, excavation backfill, bank stabilization, and site restoration. Confirmation sampling results are described in

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Section 4.0. The EE/CA Quality Assurance Project Plan (QAPP; Apex, 2013a) contains a description of the field and quality assurance methods that were used for this project. Environmental construction was completed by Terra Hydr, Inc. (Terra Hydr; Subcontractor) of Sherwood, Oregon under subcontract to Apex. The removal action activities were documented by Apex. The removal action was completed from September 23 to November 13, 2013. Construction drawings for the Removal Action are included in Appendix A, and a Photograph Log is included in Appendix B. Sampling results are summarized in Tables 1 through 4.

A summary table of the chronology of site removal and confirmation sampling activities is provided below. A detailed description of the preparatory activities, and removal activities at each OU, including confirmation sampling, soil excavation, and waste management follows. Copies of the field log books are included in Appendix C.

Date Range	Activity	Activity Summary
9/9/13	Project start	Equipment mobilization, establish OHWL location
9/9/13 - 9/18/13	Brush clearing, silt fence installation	Close cut vegetation, identify debris for removal, stage vegetation for disposal.
9/13/13	Geotechnical evaluation	Evaluate overall bank stability and prepare recommendations for stabilization.
9/13/13, 9/19/13, 10/1/13	Remove burn box and manage debris	Remove burn box and debris contents by hand shoveling into excavator bucket. Stockpile waste in separate stockpile on pavement with plastic covering (9/13/13). Collect waste profile sample "Ash Stockpile" (9/19/13). Transload to secure drop box for storage until disposal (10/1/13). Collect REX-16 (10/1/13).
9/13, 9/17, 9/19	Remove pressure cylinder and clean	Remove pressure cylinder, clean, and containerize fluids. Collect waste profile sample "Tank Water" on 9/19/13.

Date Range	Activity	Activity Summary
9/18/13-9/19/13	End of pipe excavation	Remove contaminated soils at end of pipe and complete confirmation sampling on 9/19/13. Stockpile soil. Samples REX-1 through REX-3 collected.
9/20/13, 10/4/13	Pipe cleaning and removal.	Remove accumulated sediments from pipe, make five passes through pipe with pressure jet, containerize water. Trenching to remove pipe. Collect waste profile sample "Rinsate Drum" on 10/4/13 of containerized rinsate water.
9/24/13 – 9/25/13	Gravel filter removal	Remove contaminated soils, piping, and manhole from gravel filter. Load and transport soil from gravel filter and end of piep excavation to landfill. Confirmation samples REX-4 through REX-11 were collected on 9/25/13.
9/23/13, 9/25/13 – 10/8/13	Bank repair	Remove debris, grade soil in place, construct bank repair consisting of vegetated sand bag system. Collect sample RAC-1 (10/1/13). Install jute matting and topsoil at areas impacted by removal and stabilization activities.
9/26/13	Remove contaminated soil from WS02SS area.	Remove contaminated soil and collect confirmation sample REX-12. Stockpile soil.

Date Range	Activity	Activity Summary
10/1/13 – 10/4/13	Remove contaminated soil from the top of bank near parking area.	Remove soil and sandblast grit accumulations observed at the top of the bank near parking area. Stockpile soil. Confirmation samples REX-13, REX-14 (9/26/13), REX-15 (10/1/13), and REX-17 (10/4/13) collected.
10/4/13	OP02SS Removal	Limited excavation of areas disturbed by equipment prior to site restoration. Stockpile soil, Sample RAC-2 collected (10/4/13).
10/4/13 – 10/8/13	Grading, Topsoil Placement, Jute Reinforcing	Install jute matting and topsoil at areas impacted by removal and stabilization activities. Transport remaining soil to landfill.
October 9, 2013	Revegetation	Hydroseed areas disturbed by project.
October 9, 2013	Paving and demobilization.	Pave areas where pavement was removed during site activities, demobilize equipment from site.
June 30 through July 10, 2014	Additional removal at burn area	Complete additional soil removal at burn area and OP02SS area. Place soil in dropbox for disposal and transport to landfill on July 10, 2014. Confirmation samples REX-18 through REX-22 were collected. For disposal profiling, "Waste Profile Sample" collected on June 30, 2014.

### 3.1 Preparatory Activities

**Underground Utility Locates.** Prior to initiating the removal action activities, Apex contacted the One-Call utility notification center for an underground utility locate. Underground utility locates were also completed by the subcontractor.

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**Health and Safety Plan.** A site-specific Health and Safety Plan (HASP) for Apex personnel involved with the project was prepared in accordance with the Occupational Safety and Health Act (OSHA) and 29 CFR 1910.120. The Subcontractor utilized Apex's site-specific HASP.

**Soil Waste Profiling.** A waste profile was prepared and a disposal permit was obtained for non-hazardous disposal of contaminated soils from the gravel filter, gravel filter outfall, and the bank at Waste Management's Hillsboro Landfill, a Subtitle D Landfill. The soil disposal was profiled using Sample "GF-HA-Composite" – Lab report A3I0036, collected near historical sample location UP02SS. Disposal documentation is provided in Appendix D. Waste profiling for additional waste streams generated during the removal action are described in Section 5.

**Permitting and Notifications (PEN 1, NMFS, and ODOT).** The removal action was completed under the permit exemption authority granted to the EPA under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980. Because of the exemption, a City of Portland grading/site development permit was not required. Contractor specifications, erosion controls, and work methods were developed and implemented following the substantive requirements of the City of Portland Stormwater Manual.

PEN 1 was involved in the development of the EE/CA Removal Action Work Plan and verified the proposed removal action activities were consistent with their USACE jurisdictional requirements, at the time of work plan development.

- PEN 1 provided comment indicating that the gravel filter excavation was to be planted with grass (as opposed to paving) after backfill. Copies of email correspondence documenting the work plan review and comment process are included in Appendix E.
- Apex also verbally coordinated the work schedule with PEN 1 in order to coincide with the August to mid-October low water work window. Work on the bank was completed in mid-October, within the work window.
- Apex also verbally coordinated with PEN 1 during the brush clearing on the bank since some of the vegetation being cut was below the OHWL. PEN 1 confirmed that cutting some vegetation was considered a maintenance type activity and would not be subject to federal or state removal/fill regulations.
- Apex coordinated with PEN 1 for their approval of the additional bank stabilization measures utilized just north of the building. PEN 1 requested some additional information regarding the life expectancy of the jute matting, and reminded Apex about the seed specification. No other comments were provided. Copies of email correspondence documenting the review and comment for the additional bank stabilization measures are included in Appendix E.

The entire Site is located on the Columbia River which contains a number of Endangered Species Act (ESA)-listed species; as such, EPA requested that a notification to National Oceanic and Atmospheric

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Administration NOAA Fisheries be made. The notification was made on August 26, 2013 describing the planned removal action and specifying that the removal actions would be limited to the areas above the OHWL. The NOAA Fisheries notification acknowledged the ESA-listed species found in the Columbia River and described the erosion BMPs that were implemented to prevent migration of sediments to the river. No comments were received from NOAA Fisheries. This NOAA Fisheries notification is included in Appendix E.

**Access.** Components of the removal action were completed on ODOT property. ODOT required an access agreement to complete work on property under their control that is owned by the state. After review of Apex's insurance and the work plan, and verification that the work would not have impact to Interstate 5, ODOT provided verbal approval for right of entry on September 5, 2014. ODOT completed periodic inspections throughout the course of the project. A copy of the ODOT access agreement is included in Appendix E.

**Site Work Area/Exclusion Zone.** The entire Site was established as an exclusion zone. Access to the docks was only available from the west stairs during the removal action. Access to the Site was restricted by fencing of the access road. Apex coordinated with the tenant of the shop as needed for this tenant to access the building.

**Protection of the Environment.** Temporary erosion and sediment control measures were implemented and maintained in accordance with best management practices (BMPs) consistent with the substantive requirements of the City of Portland Stormwater Manual. Biofilter bags were used to protect the inlet on the northwest corner of the paved area adjacent to the shop (Photographs 1 and 2). Silt fencing was installed along the length of the bank area at the OHWL (Photographs 3 and 4). Other erosion and sediment control measures such as stockpile berms and stockpile covers were also used. Erosion controls were routinely inspected throughout the course of the removal action.

**Surveying.** Prior to beginning work, Thomas Burton, registered professional engineer in Oregon (No. 5373), established several offsets, tied into benchmarks established by the City of Portland. The offsets were used to map the location of the OHWL (17.6 feet NGVD) in order to define the riverward work area boundary and establish erosion controls.

**Brush Clearing.** The bank stabilization area was close-cut and grubbed of invasive blackberry root balls in order to prepare for stabilization, and to allow a thorough inspection of the river bank in order to identify stabilization areas (Photograph 5 and 6). Close-cutting was completed with a combination of gas-powered mechanical tools (weed trimmers with steel blades) and hand tools (machetes and cutters). Vegetation removed from the bank area was stockpiled on the Site. Because of the relatively light weight of the vegetation debris and the minimal increase in disposal cost compared to additional transportation, the vegetation debris was transported to Hillsboro Landfill with the contaminated soil in order to ensure that no contaminated soil/root material was inadvertently sent to a composting facility (see Section 5).

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**Geotechnical Inspection.** Following the brush clearing and debris removal, a geotechnical engineer from Apex conducted a site walk to characterize the overall bank stability. The results of the engineering evaluation were summarized in a memorandum entitled “OU1 – Bank Stabilization Recommendations,” dated September 13, 2013 (Apex, 2013c). A copy of the memorandum is included in Appendix E.

In general, the soil exposed above the OHWL was found to consist of silts and fine sands mixed with random small to medium debris. The debris generally consisted of pieces of metal, wood, cement concrete, asphalt concrete, and vegetation. Larger debris was also present including pieces of large steel tanks, concrete slabs, and a few logs. Most of these appear to have been placed in the bank in order to function as small retaining structures associated with past site usage. A number of foundations are also present in the bank. These were generally constructed by placing concrete steel forms made from surplus equipment (old boat tanks, drums, etc.).

The majority of the bank showed no signs of significant erosion or slope failure. The blackberry bushes likely provided some protection against direct rainfall but would have been ineffective in restraining flood-based erosion. The work plan specified grading the slope to a smooth and uniform condition, and a re-vegetation program consisting of a 6-inch topsoil layer, jute fabric, and seeding. Due to the steep slopes encountered on the bank, the engineer recommended that topsoil only be placed in areas where organic lean soils were exposed during the removal action. It was the Engineer's opinion that placing a 6-inch layer of topsoil on the relatively steep bank slope could create a plane that is subject to failure.

One exception area, located riverward of the main building, required more intensive stabilization. In this area, past site operators have placed a number of taller cribs in order to develop a level landing near the building. This has resulted in near vertical conditions. The cribs consist of random metal parts and at least one steel tank. A previous site operator eventually covered much of the area with plastic sheeting, apparently as an erosion control mechanism, due to the fact that roof runoff appears to cascade over the bank in this location. Since roof runoff will continue to flow over the bank in this area, the surface of the erosional area received stabilization above and beyond the vegetation and mat solution used elsewhere at the site. The plastic sheeting was removed and the bank was stabilized with the “Envirolok” vegetated sand bag system to provide an enhanced level of erosion protection from roof runoff. The bank stabilization activities are described in detail in Section 3.3.

**Cultural Resources.** As required under the CERCLA process, EPA conducted outreach to tribal affiliations in Oregon and Washington. During this outreach process, the Confederated Tribes of the Grand Ronde commented that the possible presence of cultural resources should be accounted for, and the Tribes requested the opportunity to review the construction documents. Inadvertent discovery protocols were developed and communicated to the contractor on the project drawings. No indications of cultural resources were observed, and the inadvertent discovery protocol was not triggered.

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### 3.2 OU3 – Gravel Filter

The gravel filter media (angular rock) generally extended to a depth of 2 feet bgs over most of the length of the filter. The gravel filter area is shown on Photographs 7 and 8 contained in Appendix B. At the east end of the gravel filter near the manhole, the filter extended deeper, to depths of approximately 4 feet bgs. Based on the thickness of the gravel materials and the EE/CA sampling results, the removal was completed to a depth of approximately 3 feet bgs over the majority of the filter, and deeper (approximately 5 feet bgs) near the manhole at the east end. The width of the removal area ranged from approximately 4 to 5 feet. The removal extended approximately 6 inches vertically into the underlying soil to over-excavate potentially contaminated soil material from beneath the filter. Underlying soil was identified by the presence of medium-grained sand. The south side of the excavation was limited by the footing for the flood wall. No soils were exposed on the south side of this excavation.

An approximately 4-inch perforated pipe ran the length of the Gravel Filter and was connected to the manhole at the western end of the trench. The perforated pipe was located at the base of the gravel filter, between 2 and 3 feet bgs, and carried water from the gravel filter to the manhole east of the gravel filter, where it drained through the discharge pipe. The perforated pipe was removed and disposed during the excavation and removal of the gravel filter.

The excavated gravel filter material and over-excavated underlying materials (sand) were loaded directly onto trucks when feasible or stockpiled for later disposal. Confirmation sampling was conducted by Apex from the sidewalls of the excavation as well as from the base of the excavation to verify that the contaminated material had been removed. Sampling was completed following the protocol, locations, and frequency described in the Work Plan and summarized in Section 4.0, below. Confirmation samples were collected from two locations at the base of the excavation (REX-4 and REX-5) and five sidewall locations along the north side (REX-6 through REX-10) and one on the east side (REX-11) following removal of the manhole vault. The analytical results are discussed in Section 4. Based on the results, additional excavation was not conducted.

The flood wall footing was encountered and exposed during the gravel filter removal. The footing, shown on Photograph 8, extended into the excavation approximately 24 inches. The base of the footing was not exposed during excavation. Adjacent to the manhole area, the footing construction differs from the western portion of the filter area. In that area, the cement concrete appeared to “free-flow” in an open excavation. It was not uniformly formed like the footing at the western end of the trench.

The manhole at the east end of the gravel filter area was removed during the excavation. Two inlets were observed from the vault. One inlet from the northeast connected to the gravel filter discharge pipe, and one inlet to the south was equipped with a gate valve. Further investigation determined that no active piping was connected to the south inlet. Excavation around the manhole confirmed that no piping was connected from

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the south, suggesting that the location of the manhole at the site was not its constructed use and that the vault had been reused.

The manhole was removed and dry cleaned of debris. The manhole was taken for recycling with the other cement concrete waste materials (see Section 5.0).

Imported, clean sand material was used for the backfill material. Backfilling was completed in lifts and compacted using a mechanical plate compactor. Suitable compaction was verified with testing. The results of the compaction testing are included in Appendix A. A six inch layer of topsoil was placed over this area and seeded at the same time as the bank stabilization area (described below).

**End of Pipe Excavation Area.** On September 18, 2013, the end of pipe area was excavated. The excavation area was established based on observed surface accumulations of soil with sandblast grit. The excavation area was an irregular shape, ranging from approximately 20 to 30 feet in width, as shown on Figure 3. Excavation was primarily completed to a depth of 2 feet within the area of the excavation where soil with sandblast grit was observed, and to a depth of 1 foot laterally across the remainder of the excavation area. Photograph 9 shows the end of pipe excavation area. The final resulting excavation surface was approximately 6 inches below grade. Soil with sandblast grit was not observed on the final excavation surface.

While probing to locate the distal end of the discharge pipe, a thin lens of grit, approximately 2 inches in thickness was exposed at the north edge of the asphalt concrete pad, near the billboard sign; the location was preserved and the covered grit was later removed for disposal prior to restoration grading. Similar soil and sandblast grit accumulations were encountered at other locations at the site and are discussed below.

**Gravel Filter Discharge Pipe.** Historically, the distal end of the discharge pipe had not been located due to the heavy vegetation on the bank. During the EE/CA Data Gap Investigation, Apex and its subcontractors attempted to locate the end of the pipe through limited bank clearing and using a push-type pipe camera. The end of the pipe could not be visually observed and the camera could not be pushed down the discharge piping past approximately the north side of the paved area.

Following the bank clearing, the Subcontractor used a locating sonde attached to a semi-rigid push rod to probe the discharge pipe from the manhole outlet. The outfall was located and observed to be almost completely covered with soil so that its location was not apparent even after the bank clearing.

Once the outfall pipe was located, the discharge pipe was traced back to the manhole. The orientation of the outfall pipe generally followed the property line, and is approximately located at the intersection of the property line and the underground electric corridor (Figure 3). The distal portion of the pipe (approximately 20 feet in length) was constructed of 12-inch corrugated metal. At a point approximately corresponding to

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the top of bank, the pipe transitioned to a cement-concrete pipe. The pipe was 4 feet deep at that point. A cleanout for the pipe was also located south of the transition to cement-concrete construction and was removed.

The pipe was dry cleaned by pulling a plug through the entire length of the discharge piping to dislodge and pull accumulated sediment through the pipe. The corrugated segment of discharge piping was exposed to the joint where it transitioned to cement-concrete. The distal end was sealed with a heavy duty construction bag and secured to the pipe to collect any loose sediment in the corrugated pipe when the corrugated pipe was removed. Photograph 10 shows the excavation to expose the corrugated pipe section back to the joint with the concrete discharge pipe section. The corrugated portion of the pipe was removed and placed in a truck for landfill disposal.

The interior of the cement-concrete section of the discharge pipe was washed using a hydro-jet, a type of industrial pressure washer with high pressure nozzles on the sides of a sonde to aggressively remove accumulated material from the pipe sidewall. Terra Hydr completed five passes with the hydro-jet, rinsate water was collected in a catch pan placed under the end of the discharge, equipped with a sump pump. The sump pump transferred the collected rinsate water to a 55-gallon drum for storage. Approximately 15 to 20 gallons of rinsate water were containerized and analyzed for disposal.

After cleaning, the concrete pipe was removed by excavation. Some contaminated soil was observed immediately beneath the asphalt, in a limited area, while excavating the discharge pipe. The discolored soil was less than a foot in thickness, over an area two to three feet in width. The material was observed to have a slight odor, and photoionization detector (PID) measurements of 5.8 and 5.9 units, which would be considered low. No sheen was observed. The discolored soil was segregated and disposed of with other contaminated soil material. No other visual impacts of contamination were observed and PID field screening results did not indicate further potential impacts. Photograph 11 shows the path that the discharge piping took from the manhole. The excavation trench was backfilled with the overburden material. Each lift was compacted to a non-yielding state with a mechanical plate compactor. A final lift of clean sand was placed and compacted. Compaction testing was performed on the final lift.

**Historical WS02SS Area.** During a 2008 sampling event in the Eastern Unimproved Area, a sample was collected east of the paved area, on property owned by the state. The analytical results for that sample indicated concentrations of metals elevated above the background concentrations for antimony, arsenic, cadmium, chromium, copper, iron, nickel, selenium, silver, and zinc. Lead was almost double the USEPA RML screening level.

Because of the RML exceedance associated with sample WS02SS, the immediate vicinity around the sample location was targeted as part of the removal action. Using site landmarks and GPS coordinates collected at the time of the sampling, Apex identified the area and performed a limited removal of the area.

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Around the WS02SS location, a 5-foot radius was excavated to a depth of one foot as shown on Photograph 12. One confirmation sample (REX-12) was collected from the base of the excavation area and submitted for analysis of total metals; the location of the sample was recorded with a GPS.

### **3.3 OU1 Bank Stabilization**

Prior to completing the bank stabilization work, several areas of debris or waste accumulation were identified and removed. Removal of debris or waste accumulations is described in the following paragraphs.

**Cylindrical Pressure Vessel.** A cylindrical steel tank, 7.5 feet in length and almost 2 feet in diameter, was encountered on the bank on the west portion of the site, approximately 5 feet east of the western dock staircase (Photograph 13). Tenants at the site described that the tank was likely a compressed air tank used to start marine diesel engines. The tank was oriented such that its base was facing downslope toward the river. Field staff investigated the tank and it was determined that the tank contained water with a sheen caused by residual oil or grease on the tank side walls. The tank was intact and there was no evidence that materials had been released from the cylindrical tank. Photograph 14 shows the tank being slid up the bank.

When the tank was placed on level ground, water poured from a 1-inch threaded opening in the top of the tank. The open end of the tank was elevated to prevent further water from leaking out of the opening and the tank was securely blocked with available onsite material to protect against the tank slipping or being rolled into the river. The area where the water spilled on the ground surface was immediately cleaned up by excavating soil to a depth of 3 to 6 inches from the area. The soil was added to the contaminated waste stockpile and disposed of at the Hillsboro Landfill.

The contents of the tank and water used to clean the tank (approximately 115 gallons) were pumped from the tank and containerized in 55-gallon steel drums. The subcontractor inerted the tank with carbon dioxide and verified the atmosphere was below the lower explosive limit (LEL). The tank was cut open with a torch for better access and cleaned. The decontamination waters were also containerized in 55-gallon steel drums. The drums were labeled and secured. The sample "Tank Water" was collected for waste characterization.

**Burn Area.** A steel burn box was identified on the bank, west of the shop, approximately 6 feet from the top of the bank (Photograph 15). The box contained ash and burn debris such as wood, vegetation, metal, plastic, carpet fragments, motor gaskets, and battery terminals. The bottom of the box was too degraded to be able to remove it with the contents in place, the burn debris contents were shoveled into the bucket of the excavator, as shown on Photographs 15 and 16 and transported to the paved area where it was stockpiled separately on plastic sheeting, and bermed to prevent migration of the stockpile contents. The steel box was removed and placed in the waste metal storage area. Two metals rings were found at the bottom of the burn box removal area and these rings and associated debris, as well as an additional 6 to 12 inches of soil and ash material with metal and brick debris were removed until what appeared to be sandy bank materials were

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encountered (Photographs 17 through 19). Confirmation sample REX-16 was collected and the results are discussed in Section 4.0.

The ash stockpile (approximately 2 cubic yards) was sampled for metals after being placed in a lined and covered stockpile. Based on the analytical results, discussed in Section 5, the ash stockpile was determined to be a characteristic hazardous waste (D008) and was loaded into a covered drop box. The drop box was removed for disposal on November 13, 2013 as described in Section 5.0.

Additional removal was completed at the burn area on June 30 and July 2, 2014 as described in the focused removal work plan (Apex, 2014). A plan view and cross-section of the burn area excavation is shown on Figure 6. Excavation depths varied on the slope face based on the location where ashy soil accumulations were present (Photograph 20). At about 6 to 8 inches into the excavation towards the bottom of the slope, several mattress springs were encountered (Photograph 21), concealing approximately 1 to 2 feet of ashy soil accumulation beneath. The final average excavation depth on the slope face was approximately 18 to 20 inches deep. Excavation on the slope was completed until soils visibly free of ashy materials were encountered. Also, EPA's START contractor was on the site at the time of this excavation and conducted field screening with a portable XRF. The ashy soil resulted in high response on the XRF, and significantly lower responses were observed in the base and sidewalls of the excavation once the waste materials were removed. Confirmation sample REX-19 was collected from this part of the burn debris excavation.

As much as 3.5 feet of ashy soil was removed along a 15 foot length at the base of the slope. Ashy soils were not observed in the sidewall at a point approximately 8 feet northwest of the northwest corner of the excavation. At that point, ashy materials were present on the surface of the toe of the slope, extending in a narrow band about 8 feet further northwest. When these soils were excavated, an exposed cut between 3 and 3.5 feet high (Photograph 22) resulted at the bottom of the excavation. Similar to the conditions on the slope face, the XRF field screening results indicated elevated concentrations of lead were present in soils across these areas. The excavation at the toe of the slope removed visibly ashy soil that was present from the toe of the slope to the OHWL. Following excavation, soils that were free of ashy materials were observed across this area. Because a significant portion of the bank was exposed during the excavation, EPA agreed during a June 30, 2014 site meeting, that further excavation could jeopardize the stability of the bank, and excavation could be stopped.

The area at the toe of the slope was reinforced with Envirolok vegetated sand bags (Photographs 23 and 24) installed at approximately a 1:1 slope. The excavations were backfilled with a sandy loam-topsoil blend obtained from a commercial source (Photographs 25 and 26). As shown on Figure 6, the vegetated sandbag system and backfill results in 2 feet of cover at the toe of the slope, and the cover thickness on the slope varies from 18 to 20 inches.

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The ashy soil was sampled for total and leachable metals after being placed in a lined drop box. Based on the analytical results, discussed in Section 5, the soil waste generated during the additional removal was determined to be non-hazardous waste. The drop box was removed for disposal on July 10, 2014 as described in Section 5.0.

**Metal Cuttings.** The bank area below the west end of the shop building, east of the large poplar tree, contained an accumulation of metal lathe cuttings that were historically placed in the bank area. The area where the metal cuttings were concentrated was located east of the large tree on the bank, at the west end of the bank repair area. The area containing the metal cutting is shown on Photograph 27. Less than 1 cubic yard of metal shavings was removed during the bank repair in order to even grades on the slope. Some metals shavings were left in place because further removal would compromise bank stability by undermining the large tree, or further steepening the slope. Metal shavings that are left in place were secured behind the bank repair. Metal shavings removed from the bank area were disposed of with the non-hazardous contaminated soil. Sample RAC-1 was collected to characterize the soils that remained in place. The results are discussed in Section 4.0.

**Miscellaneous Debris.** The bank below the shop contained metal debris that was encountered during clearing and the repair work. The debris included old boat tanks, a degraded steel drum, a vehicle frame, piping, and other random metallic debris. A representative collection of the miscellaneous debris removed from the bank is shown on Photograph 28. Much of the debris was partially buried and appeared to be placed there to build up the bank in this area to create a bench at the top of the bank. Other pieces of metal were found anchored into the bank to act as retaining features. Other debris, such as the boat tank, scrap metal, and rusted metal cans were encountered on the surface. Debris was gathered and disposed of as solid waste, except for scrap metal, which was recycled.

**Concrete Counterweights.** Five large concrete blocks, weighing approximately 10,000 to 12,000 pounds each, were historically stored on the bank, near OHWL adjacent to the eastern staircase to the dock. The blocks were historically used as counterweights for the former site crane. The blocks were supported on the river side by two partially buried 55-gallon drums filled with brick material that acted as footings; the space between the drums was spanned by a decaying wooden utility pole. On the uphill side, the blocks were secured to the pavement curbing by cable attached to an anchoring device over the curb. The blocks were sitting directly on bank on the uphill side. The blocks posed a safety concern to workers clearing the bank, and in the longer term, a risk to the dock below were they to shift and fall or slide down the bank. The blocks were lifted off the bank, as shown on Photograph 29, and placed on the pavement area for the remainder of the project. Following completion, the blocks were placed on the flat area at the former crane pad for permanent storage.

**Top of Bank Sand Blast Grit.** With the bank cleared of vegetation, localized areas of discarded green sand blast grit with soil were observed on the ground surface. Initially, these areas appeared to be

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associated with the gravel filter discharge pipe. While probing to locate the distal end of the discharge pipe, a thin, lens of grit, approximately 2 inches in thickness was exposed at the north edge of the asphalt concrete pad, near the billboard sign; the location was preserved and the covered grit was later removed for disposal prior to restoration grading.

Near the former crane pad, accumulations of soil and sandblast grit were also observed and removed. These accumulations were found to extend along the top of bank curbing, extending approximately four feet down the bank. Along the westernmost portion of the bank, the soil and sandblast grit extended beneath a thin concrete cap. After removing the concrete cap (up to 3 inches thick), additional green soil and sand blast grit were observed at varying thicknesses (up to 2 feet at its thickest accumulation). Photograph 30 shows the removal of the concrete cap and underlying sand blast grit residual. The final removal area was approximately 8 feet by 30 feet extending between the curbing and the short stub-wall extending east from staircase. Removal in this area also included the location and interval corresponding to historical sample SS-21. The soil was removed using an excavator until no additional visual impacts were observed. Confirmation samples REX-13 through REX-15 were collected from the top 6 inches of the leave surface. On October 4, 2014, additional removal was completed in the area of REX-13 based on the laboratory results. Confirmation sample REX-17 was collected at the former REX-13 location where additional removal was conducted. The analytical results are described in Section 4.0.

Coincident with the removal activities described above, a repair was completed for the bank area located riverward of the main shop building.

**Bank Repair Area.** Based on the results of the geotechnical evaluation, the area riverward of the building required repair in order to stabilize the bank. In that area, past site operators had placed a number of cribs to develop a level landing near the building. This resulted in near vertical conditions. The cribs consist of random metal parts and at least one steel tank. A previous site operator eventually covered much of the area with plastic sheeting. It appears that this was undertaken as an erosion control mechanism due to the fact that roof runoff appears to cascade over the bank in this location. The near vertical conditions created by the cribbing, and the erosion from the roof runoff required additional stabilization measures. Photograph 31 shows the bank erosion and near vertical bank slopes adjacent.

The lower, easternmost crib is below the OHWL, and as such, it was not removed. The slope above this crib was smoothed and some limited load was removed and incorporated into lower lying, adjacent areas (above OHWL). Most of the upper crib, constructed of metal from former tanks or drums, was removed and the slope was flattened. Metal debris that was expressed at the ground surface during the repair work was removed for salvage. Environmental field screening (PID screening and soil observations) was conducted during the repair to assess whether additional contamination sources may be present. PID results greater than 5 units and soils with olfactory indications of contamination were not observed.

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Because the slopes were significantly over-steepened to nearly vertical towards the west end of the building and also heavily channelized from roof runoff, additional stabilization measures were used to repair the bank in this area. This portion of the bank area was stabilized using a vegetated sand bag system (EnviroLok; please see <http://www.envirolok.com/>) which are routinely used to stabilize slopes in areas where runoff occurs. A row of sand bags was placed along (and above) the OHWL, and the sand bags were placed and sloped in an attempt to generally match the adjacent grades. The placement and construction of the EnviroLok stabilization are shown on Photographs 32 and 33. The completed, fully vegetated system will provide an enhanced level of erosion protection, slowing down surface runoff and minimizing channeling from roof runoff.

**Historical OP02SS Sampling Location.** During a previous investigation, sample OP02SS was collected from the area below the shop at the top of the bank, immediately west of the eastern staircase walkway (near the crawlspace access). Analysis of OP02SS indicated that the area contained lead at concentrations above the industrial RML.

This area was located within the bank stabilization area, but was disturbed during the bank repair described previously. Because of the soil disturbance, loose and wet soil that would interfere with the stabilization measures were removed. This area corresponded to the location of historical sample OP02SS location. An area approximately 4 feet by 5 feet was excavated to a depth of 6 inches using mechanical excavation and hand tools; the excavation area is shown on Photograph 34. Sample RAC-2 was collected from the excavation surface. This small area was backfilled with sand and revegetated as described below. The results are discussed in Section 4.0.

Additional removal was completed in this area on June 30, 2014 as described in the focused removal work plan (Apex, 2014). An area 7 feet by 7 feet was excavated to a depth of approximately 18 to 20 inches (Photograph 35). This included the approximately 6 inches of sand that was placed at the surface of the former excavation. One composite confirmation sample was collected, REX-18 (Photograph 36). EPA's START contractor was on the site at the time of this excavation and conducted field screening of the excavation floor and sidewalls using a portable XRF analyzer. Field screening with the XRF indicated that soils in the excavation sidewalls and bottom were below RMLs. This area was restored using the same site restoration methods utilized on other parts of the site, as described below (Photographs 37 and 38).

**Grading, Topsoil Placement and Jute Reinforcing.** Grading using hand tools and the excavator bucket was completed across the areas that were disturbed during soil excavation activities at the gravel filter outfall, along the top of the bank where soil and sandblast grit was removed, and the top of the repair area. Topsoil was also placed over each of these areas.

Jute matting was installed over the limits of the stabilization area shown on Figure 3. The jute matting provides protection and stabilization of the exposed topsoil until the new vegetation becomes established.

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The jute matting was installed over the top of the bank slope, as shown in the Construction Drawings, laid over the ground surface extending to the OHWL, and anchored to the bank using metal staples as described by the manufacturer. Photograph 39 shows the representative installation of the jute matting over the bank stabilization area. Rocks and other larger debris were removed from the bank as feasible to ensure the jute was in good contact with the ground surface. Erosion control BMPs situated at the OHWL will remain in place until vegetation is established.

Both of the additional excavations completed in 2014 were restored using the same methods as the rest of the project.

**Revegetation.** On October 9, 2013, following jute installation, the bank stabilization area, repair area, gravel filter area, and areas disturbed during the construction were revegetated by hydroseeding using a specified mixture meeting the PEN1 requirements. The hydroseeding was completed using the PEN1 specified application rate of 150 to 200 pounds per acre using a mix of 25 percent hard fescue, 25 percent blue fescue, 25 percent creeping red fescue, and 25 percent chewings fescue. Because the application occurred after September 15, PEN1 required the addition of annual ryegrass be added at a rate of 100 pounds per acre. Photograph 40 shows the bank stabilization area following application of the hydroseed.

Both of the additional excavations completed in 2014 were planted with the same seed blend used for the rest of the project

**Paving.** On October 9, 2013, the paving removed to excavate the gravel filter discharge pipe and manhole was replaced. The restored paving area is shown on Photograph 41.

## **4.0 Sampling Results**

Soil samples were collected from the sidewalls and/or of the base of excavations once the target excavation extent and depth was achieved, following the sampling frequency and methods outlined in the work plan. The sampling results are provided in Tables 1 through 4. Soil samples collected in each area are summarized below (all samples collected during 2013 primary removal action, unless noted):

- REX-1 through REX-3 – Confirmation samples for the end of pipe excavation;
- REX-4 through REX-11 – Confirmation samples for the Gravel Filter excavation;
- REX-12 – Confirmation sample for WS02SS excavation;
- REX-13 through REX-15, REX-17 – Confirmation samples for soil and sandblast grit removal at top of bank;
- REX-16 – Soil sample following burn debris removal;
- RAC-1 – Soil sample in area where metal shaving left in place and covered;

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- RAC-2 – Soil sample at former OP02SS excavation;
  - RAC-18 Comp – Composite soil sample at RAC-2 location (collected June 30, 2014) ; and
  - RAC-19 through RAC-22 – Composite and discrete samples collected from the former burn area removal (collected July 2, 2014).

Samples were labeled using the following nomenclature:

REX-1 (2-2.5) or RAC-1 (2-2.5)

Where:

REX-1 = Removal Excavation Sample Number 1

(2-2.5) = Depth Interval of Sample (in feet)

In some cases where soils were disturbed in contaminated areas as part of the removal action, samples were collected to characterize the conditions at a particular area. These samples were labeled "RAC" – for Removal Action Characterization.

Each sample location was recorded with a sub-meter-grade Global Positioning System (GPS).

#### **4.1 Laboratory Analytical Plan**

Laboratory analyses were completed by Apex Labs, of Portland, Oregon, under subcontract to Apex Companies. Apex Labs arranged to have the butyl-tin analyses subcontracted to Analytical Resources, Incorporated (ARI) of Tukwila, Washington. Contaminants of concern for removal included metals (primarily copper and lead), TBT, organochlorine pesticides (primarily DDE, DDD, DDT, and endosulfan sulfate), PAHs (indeno(1,2,3-cd)pyrene, benzo(b)fluoranthene), and bis(2-ethylhexyl) phthalate). Therefore, the analytical program included the following analyses:

- Metals (antimony, cadmium, chromium, copper, lead, nickel, and zinc) using EPA 6000/7000 methods;
- Organochlorine pesticides using EPA 8081B;
- Polychlorinated biphenyls (PCBs) using EPA Method 8081B;
- Organotins using the Krone Method; and
- Semi-volatile organic compounds (SVOCs) using EPA 8270.

Metals were used as the indicator compound and were the primary target analyte. Organochlorine pesticides, PCBs, organotins, and SVOCs were analyzed on a frequency of approximately 25 percent.

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For the burn area, soil analyses were completed for lead only as described in the focused removal work plan (Apex, 2014).

Waste designation samples were also analyzed for the burn debris, the contents and cleaning rinsate generated from the cylinder, the cleaning residuals from the pipe cleaning, and the soil disposed for the additional removal at the burn area. These analyses are discussed further in Section 5.0.

## 4.2 Confirmation Sampling Results

Soil samples were collected in accordance with the procedures described in the Removal Action Work Plan (Apex, 2013d). Confirmation sampling was completed for each removal area to document removal effectiveness and representative conditions after the removal and stabilization work was completed. Tables 1 through 4 consist of the soil data set for the Site. In these tables, sample results that were removed by excavation are indicated by a strikethrough of the corresponding sample. Laboratory analytical reports are included in Appendix F.

**End of Pipe Excavation Area.** Three confirmation samples were collected from the excavation around the distal end of the gravel filter discharge piping, REX-1, REX-2, and REX-3. Consistent with the work plan, 2 soil samples were analyzed for the full suite of analytical parameters and 1 sample was analyzed only for metals. Samples REX-1 and REX-2 were analyzed for the full-suite of analytes including metals (Table 1), butyltins and PCBs (Table 2), organochlorine pesticides (Table 3), and SVOCs (Table 4). Sample REX-3 was only analyzed for metals. None of the detected analytes were detected above the industrial RMLs.

**Historical WS02SS Area.** The confirmation sample collected from the base of this excavation area (REX-12) was analyzed for seven metals including antimony, cadmium, chromium, copper, lead, nickel, and zinc. Detected concentrations of metals were below EPA industrial RMLs. Compared to the concentrations detected in the 2008 WS02SS sample, the excavation resulted in a concentration reduction of 72 percent (zinc), 97 percent (copper), and 92 percent (lead). The analytical data are presented in Table 1.

**Gravel Filter Area.** The Gravel Filter Area confirmation samples were analyzed for the following constituents:

- Metals: antimony, cadmium, chromium, copper, lead, nickel, and zinc; REX-5 to REX-11;
- Organotins (REX-5 and REX-9 only);
- Polychlorinated biphenyls (PCBs): REX-5 and REX-9;
- Organochlorine pesticides REX-5 and REX-9; and
- SVOCs: (REX-5 and REX-9).

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All confirmation sample results from the gravel filter were below EPA industrial RMLs and EPA industrial RSLs.

**Top of Bank Area.** Several confirmation samples were collected from the removal area near the top of the bank. These samples included REX-13, REX-14, REX-15, and REX-17. Of these samples, REX-13 was the only sample where concentrations exceeded RMLs based on the lead concentration at REX-13 (911 mg/kg). Additional excavation was completed, and sample REX-17 reflects the final concentrations at this removal area. Final concentrations in this area are below RMLs.

**Burn Area.** A single confirmation sample, REX-16, was collected from the burn area following removal of the steel container and debris material. The sample was collected from the base of the removal area. REX-16 was analyzed for RCRA-8 metals, with follow-up analysis for organochlorine pesticides and SVOCs based on analytical results and communication with EPA.

Lead was detected in REX-16 (collected beneath the initial burn debris removal area) at a concentration of 1,060 mg/kg, 1.3 times the industrial RML for lead. The remaining metals, arsenic, barium, cadmium, chromium, and mercury were detected at concentrations below the industrial RML. Selenium and silver were not detected above the reporting limit. Benzo(g,h,i)perylene was detected at a concentration of 100 µg/kg, which is below the RML. No other SVOCs were detected in sample REX-16. Organochlorine pesticides were not detected in sample REX-16.

Confirmation sampling completed during the additional removal in June and July 2014 in this area included the following locations, as shown on Figure 6:

- REX-19 Comp – a ten point composite from the face of the bank including five subsamples from the sidewalls were collected at approximately 1 foot below grade, and five samples from the bottom surface of the excavation, approximately 18 to 20 inches below grade.
- REX-20 – a discrete sample collected above the visible waste accumulations from 4 to 10 inches below the grade of the slope.
- REX-21 – a three point composite sample of the exposed sidewall at the toe of the bank, collected from approximately 18 to 20 inches below grade.
- REX-22 – a five point composite sample at the toe of the slope, collected from approximately 36 to 42 inches below grade.

Lead was detected in REX-19 (950 mg/kg), REX-21 (2,820 mg/kg), and REX-22 (6,460 mg/kg). The concentrations of lead in soil remain above the RML at these locations. As described in Section 3.3, the vegetated sandbag system and backfill results in 2 feet of cover at the toe of the slope, and the cover thickness on the slope varies from 18 to 20 inches. The detected concentration of lead in REX-20 (63.6 mg/kg) is well below the RML. These data indicate that the surface cover adjacent to the excavation area is not impacted by elevated concentrations of lead.

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**Bank Repair Area.** A single sample (RAC-1) was collected from the leave surface of the bank repair area at a location where metals shavings were left in place. This sample was analyzed for metals and PCBs. PCBs were not detected and no detected concentrations of metals exceeded the industrial RMLs.

**Historical OP02SS Sampling Location.** A limited excavation (approximately 6 inches deep) was completed around historical sample location OP02SS because disturbance of this area where historical contamination was present could not be avoided during the bank stabilization. A single characterization sample, RAC-2 was collected from the leave surface of the limited OP02SS excavation. Sample RAC-2 was analyzed for metals (antimony, cadmium, chromium, copper, lead, nickel, and zinc) and PCBs.

Lead was detected in sample RAC-2 at a concentration of 2,300 mg/kg, which exceeds the industrial RML for lead. Other metals were detected at concentrations that were below their respective industrial RML concentrations. Total PCBs were also detected in sample RAC-2 at a concentration of 18,450 µg/kg, which is below the industrial RML for total PCBs. The detected individual Aroclor compounds are also below their respective industrial RML concentrations, but represent an increase in concentrations compared to PCB concentrations in historical OP02SS. The analytical results for metals are presented in Table 1; PCB analytical results are presented in Table 2. Laboratory analytical reports are included in Appendix F.

Confirmation sampling completed during the additional removal in June and July 2014 to remove soils in the vicinity of RAC-2 included one composite confirmation sample (REX-18 Comp). Sample REX-18 Comp consisted of a 9 point composite sample (5 subsamples from the floor and four subsamples from the sidewalls). The floor subsamples were collected from approximately 18 to 20 inches below grade, and the sidewall subsamples were collected from approximately 1 foot below grade. Based on the detected concentration of lead in confirmation sample REX-18 Comp, 426 mg/kg, the concentrations of lead in this area are below RMLs following the additional removal.

## **5.0 Waste and Debris Disposal and Recycling**

Contaminated soil that was excavated from the site was taken to the Waste Management Hillsboro Landfill in Hillsboro, Oregon. A total of 13 loads (166.39 tons) of soil were taken to the landfill for non-hazardous disposal from September 24 to October 7, 2013. Included in this amount was approximately 5 tons of vegetation that was cleared from the bank area. The landfill permit and scale tickets are included in Appendix D. Nearly all the soil excavated and taken for non-hazardous disposal was from the Gravel Filter (OU3) and the end of pipe. Approximately 15 tons of soil was removed from the top of bank and bank repair area (OU1).

On November 13, 2013, 1.53 tons of contaminated debris was taken to ChemWaste Management in Arlington, Oregon for disposal. This waste was designated as a characteristic hazardous waste, based on

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the leachable lead content and assigned a D008 waste code. The manifest and scale ticket are included in Appendix D. This material was profiled using the data contained in Apex Labs report A3I0420 for sample "Burn Debris", included in Appendix D.

On July 11, 2014, 8.31 tons of contaminated soil from the additional excavations was taken to the Hillsboro Landfill. This waste was designated as non-hazardous waste, based on total and leachable lead content. The waste profile and scale ticket are included in Appendix D. This material was profiled using the data contained in Apex Labs report A4F0761-02 for sample "Waste Profile", included in Appendix D.

On October 4, 2013, 3 loads of concrete debris were taken to Porter Yet in Portland, Oregon for recycling. Receipts for this disposal are included in Appendix D.

On October 4, 2013, 3 loads of scrap steel were taken to Metro Metals in Portland, Oregon for recycling. Receipts for this disposal are included in Appendix D.

On October 7, 2013, 1 ton of miscellaneous debris was taken to the Waste Management Hillsboro Landfill in Hillsboro, Oregon for disposal. Receipts for this disposal are included in Appendix D.

Water disposal included six drums of water waste consisting of 1 drum of water rinsate from the pipe cleaning, 3 drums of water from the pressure tank cleanout, and two drums of decontamination water from the EE/CA data gap investigation. Additionally, there is one drum of oily rags and sorbent materials from the cleanout of the pressure tank. The following data was used as the basis for the disposal profiles:

- Sample "Rinsate Drum" – Lab report A3J0152 – 2 drums water from pipe cleaning and equipment decontamination;
- Sample "Tank Water" – Lab report 310420 – 2 drums water and 1 drum oily rags, sorbent materials, and sludge from pressure tank cleaning
- EE/CA investigation results – Lab Report A4B0365 - 2 drums decontamination and purge water from EECA data gap investigation.

The 2 drums of "Tank Water" and 2 drums of "EECA Decon Water" were sent to PPV of Portland, Oregon for non-hazardous treatment. The exception of the 1 drum of water from pipe cleaning and equipment decontamination was sent to ChemWaste Arlington for solidification treatment as a D008 (lead toxicity) hazardous waste. The drum of oily rags, sorbent materials, and sludge was sent to the Hillsboro Landfill for non-hazardous disposal. The 2 drums of "EECA Decon Water" were transported from the site on February 21, 2014 and the remainder of the drums were transported from the site on February 18, 2014.

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## **6.0 Erosion Controls and Inspections**

As a condition of the AOC, EPA required implementation of a monitoring and maintenance program. A Monitoring and Maintenance Plan (Apex, 2014b) was prepared to define the scope of the monitoring for the removal action. Apex periodically monitored the site (at least monthly) until November 2014. By December 2013, the seeding had aggressively taken at the site and a uniform cover of grass was present across the site. Photographs 41 through 43, taken during December 2013 and February 2014 site visits show that the seeding had taken and that the bank stabilization areas withstood the winter season rains. Monitoring of the site continued through November 2014. Erosive channeling, sloughing, or subsidence was not observed during the monitoring events. The stabilization measures have taken well, and are accomplishing the goals. Monitoring and maintenance progress reports were prepared on July 31, 2014 (Apex, 2014c) and November 13, 2014 (Apex, 2014d) describing the results of the routine inspections and maintenance activities. These reports are included in Appendix E.

Currently, the silt fence along the west bank of the Site remains in place. Now that stable cover is established at the burn area, this portion of the silt fence will be removed by the owner after this winter season. Grass cover has been established and the slope conditions are stable at the Site. Monitoring and maintenance requirements for the removal action are considered complete. Long-term monitoring of the site will be completed as part of the Post Removal Site Controls that are currently being established by USEPA.

## **7.0 Project Organization, Cost and Schedule**

Contractors to the property owner performed the removal action from September 9, 2013 to November 13, 2013, with an additional excavation completed in June and July 2014. This section describes the participating organizations, their roles, and the project cost and schedule.

### **7.1 Key Organizations and Roles**

The removal action was performed by Mr. Brown contractors under EPA oversight. The roles of the key organizations during the removal actions are describe below.

**EPA On-Scene Coordinator (OSC):** The removal action was performed under the EPA Region 10 Removal Program oversight. The primary project oversight was performed by OSC Angie Zavala.

**Superfund Technical Assessment and Response Team (START)-IV:** Ecology and Environment, Inc., under the EPA Region 10 START-4 contract, provided technical assistance, oversight, environmental sampling, and was responsible for documenting site activities for EPA.

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**APEX:** Apex managed the project, documented daily activities, completed confirmation sampling, and reported to EPA.

**TERRA HYDR:** Terra was a subcontractor to Apex. Terra Hydr provided the manpower and equipment to complete the removal and stabilization activities.

**STRATUS CORP:** Stratus was a subcontractor to Apex and provided the manpower and equipment to complete the 2014 additional removal.

**Oregon Department of Transportation (ODOT):** Because work was conducted on ODOT property, ODOT periodically visited the site to verify that erosion controls were in place.

**Peninsula 1 Drainage District (PEN 1):** The project team coordinated with PEN 1 regarding the timing on the work window. PEN 1 did not complete any site visits during construction.

## **7.2 Project Costs**

Project costs for this removal action included components for EPA, START-4, and Apex. Costs for Terra Hydr, subcontracted to Apex, are also included in the summary table below. Costs for the removal action through December 2013 are summarized below:

Estimated Costs	
Organization	Estimated Costs for Removal Action
EPA	\$136,667
Apex	\$122,835
Terra Hydr	\$126,000
Stratus	\$9,900

## **8.0 Summary and Conclusions**

From September 23, 2013 through November 13, 2013, a removal action was conducted at the Pier 99 – Pier West site. Additional removal was completed in June and July, 2014. The removal action included decommissioning of the gravel filter and gravel filter outfall and removing associated contaminated soil (OU3), and stabilizing the bank area (OU1) through a combination of regrading and revegetation. Prior to the grading process, debris was cleared from the bank, including a small burn pile with debris that was characterized as a D008 hazardous waste, refuse, scrap metal, and other debris. Additionally, several accumulations of soil with sandblast grit residuals were removed for disposal, and a portion of the bank that was oversteepened and heavily channelized was repaired with a vegetated sandbag system.

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With one exception, confirmation sample results were below EPA RMLs in all areas. Lead is the only compound detected above RMLs remaining at the Site. The lead RML was exceeded at the burn area excavation, both on the slope of the excavation, and also the toe of the bank. The two foot soil cover requirement stipulated in the work plan was met at the toe of the bank, but could not be met further up the bank on the very steep slope. At the toe of the excavation, 24 inches of cover is provided by the Envirolok bags and backfill. Moving up the slope, 18 to 20 inches of soil cover was placed. Additional soil cover would raise the grade and oversteepen the slope.

The bank area (OU1) was stabilized with topsoil (where needed to promote vegetation growth), jute matting on slopes, and hydroseeding. A uniform and consistent grass cover has been established across the site. By observation, the stabilization system appears to be functioning as required. Monitoring and maintenance requirements for the removal action are considered complete. Long-term monitoring of the site will be completed as part of the Post Removal Site Controls that are currently being established by USEPA.

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## **9.0 References**

- Apex Companies, LLC (Apex), 2013a. *Engineering Evaluation/Cost Analysis Work Plan, Pier 99 – Portland Site, Portland, Oregon*. January 8, 2013.
- Apex, 2013b. *Engineering Evaluation/Cost Analysis, Pier 99 – Portland Site, Portland, Oregon*. June 13, 2013.
- Apex, 2013c. *OU1 – Bank Stabilization Recommendations, 1610 North Pier 99 Street, Portland, Oregon. Letter recommendation from Apex to USEPA On-Scene Coordinator*. September 13, 2013.
- Apex, 2013d. *EE/CA Removal Action Work Plan, Pier 99 – Portland Site, Portland, Oregon*. September 26, 2013.
- Apex, 2014a. *Proposed Additional Focused Removal Activities, 1610 North Pier 99 Site, Portland, Oregon*. May 27, 2014.
- Apex, 2014b. *Revised Proposal for Monitoring and Maintenance Plan, 1610 North Pier 99 Site, Portland, Oregon* July 17, 2014.
- Apex, 2014c. *Monitoring and Maintenance Report: July 2014 Progress Report, 1610 North Pier 99 Site, Portland, Oregon* July 31, 2014.
- Apex, 2014d. *Monitoring and Maintenance Report: November 2014 Progress Report, 1610 North Pier 99 Site, Portland, Oregon*, November 12, 2014.
- Oregon Department of Environmental Quality, 2013. *Background Levels of Metals in Soil for Cleanups*. March 20, 2013.
- USACE, 2004. *Portland-Vancouver Harbor Information Package, Second Edition. Reservoir Regulation and Water Quality Section*. USACE Portland District, November 2004.
- U.S. Environmental Protection Agency, 2004. *Region III BTAG Freshwater Screening Benchmarks*. 2004. <http://www.epa.gov/reg3hwmd/risk/eco/btag/sbv/fw/screenbench.htm>
- U.S. Environmental Protection Agency, 2012. *Regional Removal Management Levels for Chemicals (RMLs)*, November 2012. <http://www.epa.gov/region4/superfund/programs/riskassess/rml/rmlgentable.html>

Table 1  
Soil Sample Results - Metals  
Pier 99 - Pier West  
Removal Action Report

Sample ID	Date Sampled	Sample Depth (feet)	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
			mg/kg (ppm)																						
Historical Samples																									
BK01SS	10/30/2008	0-0.5	5,570	<6 JL	2.2	70	--	0.36 JQ (0.50 SQL)	2,530	9.5	4.3 JQ (5.0 SQL)	95.1	12,100	21.4	2,190	207	<0.099	9	690 JH	0.8 JQ (3.5 SQL)	<0.99	<159	--	32.4	88.3
SS-5	7/3/2003	1	--	--	<0.1 <sup>8</sup>	--	--	<0.1 <sup>8</sup>	<0.1 <sup>13</sup>	<0.1 <sup>8</sup>	--	--	--	628	--	--	<0.0002 <sup>8</sup>	--	--	<0.1 <sup>8</sup>	<0.1 <sup>8</sup>	--	--	--	--
SS-6	7/3/2003	1	--	--	<0.1 <sup>8</sup>	--	--	<0.1 <sup>8</sup>	<0.1 <sup>13</sup>	<0.1 <sup>8</sup>	--	--	--	86.5	--	--	<0.0002 <sup>8</sup>	--	--	<0.1 <sup>8</sup>	<0.1 <sup>8</sup>	--	--	--	--
UP01SS	10/30/2008	0-0.5	6,650	48.4	15.1	599	--	7.5	10,800	201	15.4	83,000	38,100	6,790	5,260	465	0.61	94.7	432 JH	3.6 JQ	5.2	431 JQ	--	33.7	4,130
SS-3	7/3/2003	0.5	--	--	<0.1 <sup>8</sup>	--	--	<0.1 <sup>8</sup>	<0.1 <sup>13</sup>	<0.1 <sup>8</sup>	--	--	--	173	--	--	<0.0002 <sup>8</sup>	--	--	<0.1 <sup>8</sup>	<0.1 <sup>8</sup>	--	--	--	--
SS-4	7/3/2003	0.67	--	--	<0.1 <sup>8</sup>	--	--	<0.1 <sup>8</sup>	<0.1 <sup>13</sup>	<0.1 <sup>8</sup>	--	--	--	36.0	--	--	<0.0002 <sup>8</sup>	--	--	<0.1 <sup>8</sup>	<0.1 <sup>8</sup>	--	--	--	--
WS01SS	10/30/2008	0-0.5	9,830	<6.3	3.7	86.1	--	0.8	4,100	15.2	8.4	503	16,300	90.8	2,480	277	0.42	11.7	658 JH	1.1 JQ	<1	2,620	--	40	169
WS02SS	10/30/2008	0-0.5	5,850	14.7	16	274	--	4.4	7,790	79.3	14.4	17,300	52,200	1,590	3,520	574	0.16	150	478 JH	4.2	1.1	<252	--	55.8	1,240
OP01SS	10/30/2008	0-0.5	9,900	--	2.7	124	--	0.97	4,840	15.4	6.2 JQ	41.4	16,100	27	3,220	365	0.082 JQ	13.1	880 JH	39.9	--	--	--	--	127
OP02SS	10/30/2008	0-0.5	7,750	--	20.9	379	--	4.9	13,000	87.8	15.4	9,260	27,400	1,380	3,100	419	2.5	38.4	1970 JH	50.5	--	--	--	--	2,170
OP03SS	10/30/2008	0-0.5	13,500	--	11.4	135	--	1.1	5510	26.6	8.6	107	22,700	47.2	3,680	441	0.31	18.9	1140 JH	51.8	--	--	--	--	169
B-9 (12.5-15.0)	2/21/2013	12.5-15.0	--	--	--	--	--	--	--	--	--	24.4	--	7.4	--	--	--	--	--	--	--	--	--	--	56.4
Gravel Filter Area																									
TP-2 (1.5-2.0)	2/19/2013	1.5-2.0	7,420	21.9 N*	12	297*	0.2	1.8	5,700	85.2 N*	19.4	45,100	15,100	4,210 *	4,590	229	1.06 *	85.0 *	297	<3.8	2.3 N	656 N	<1.9	28.3	1,660
TP-2 (3-5)	2/19/2013	3-5	8,980	<1.7 N*	8.0	936 *	0.3	0.6	4,490	55.8 N*	9.7	1,750	21,400	126 *	5,000	354	--	24.7 *	1070	<3.5	<0.4 N	225 N	<1.7	54.5	259
TP-2 (4.50-5.0)	2/19/2013	4.5-5.0	7,050	<1.8 N*	5.1	113 *	0.3	<0.1	3,480	31.3 N*	7.9	1,630	18,400	122 *	3,600	295	0.38 *	16.7 *	732	<3.7	<0.5 N	240 N	<1.8	45.0	151
TP-3 (1.5-2.0)	2/19/2013	1.5-2.0	7,840	3.1 N*	5.1	126 *	0.3	1.3	3,650	127 N*	10.8	11,800	26,700	539 *	6,610	398	--	46.4 *	716	<3.6	0.5 N	298 N	<1.8	40.5	744
TP-3 (3-5)	2/19/2013	3-5	5,920	<1.6 N*	2.3	80.9	0.2	<0.1	2,650	13.6 N*	5.4	200	12,200	13.2 *	2,920	162	--	11.1 *	726	<3.3	<0.4 N	245 N	<1.6	30.9	61.6
B-6 (3.5-5.0)	2/21/2013	3.5-5.0	--	--	--	--	--	--	--	--	--	6.8	--	3.2	--	--	--	--	--	--	--	--	--	--	32.6
B-6 (3.5-5.0) DUP	2/21/2013	3.5-5.0	--	--	--	--	--	--	--	--	--	7.1	--	3.1	--	--	--	--	--	--	--	--	--	--	34.5
B-6 (8.5-10.0)	2/21/2013	8.5-10.0	5,810	<2.1 N	<2.1	71.4	0.2	0.2	10,800	10.2	4.98	8.2	11,700	3.0	2,980	164	0.07	9.5	763	<4.2	<0.5	519	<2.1	31.5	36.5
B-7 (3.5-5.0)	2/21/2013	3.5-5.0	--	--	--	--	--	--	--	--	--	10.1	--	3.7	--	--	--	--	--	--	--	--	--	--	37.7
B-7 (9.0-10.0)	2/21/2013	9.0-10.0	7,850	<2.3 N	2.3	112	0.3	0.3	4,890	12.9	6.68	13.1	15,000	4.6	3,590	231	0.04	12.1	1,010	<4.6	<0.6	342	<2.3	37.5	44.0
B-8 (3.0-4.0)	2/21/2013	3.0-4.0	4,890	<1.5 N	1.7	56.5	0.4	<0.1	2,360	7.8	4.69	7.0	10,100	3.3	2,190	146	<0.02	8.2	622	<3.1	<0.4 N	244	<1.5	26.0	33.7
B-8 (9.0-10.0)	2/21/2013	9.0-10.0	12,800	<2.4 N	4.2	151	0.5	0.5	4,580	19.3	9.06	24.7	24,900	8.1	5,410	378	0.03	16.9	1,410	<4.7	<0.6	360	<2.4	51.8	58.5
Former Crane Engine Pad																									
B-2 (7.0-8.0)	2/20/2013	7.0-8.0	11,200	<2.0 N	9.8	151	<0.1	2.7	4,870	16.5	7.8	72.7 *	19,900	139 N*	4,200	293	0.63	13.6	1,020	<4.0	<0.5	376	<2.0	47.4	341
Bank																									
SS-9	2/21/2013	0.5	12,700	37.0 N	13	298	1.0	3.1	9,660	102	13.4	4,130	28,100	638	4,840	476	2.98	33.4	2,950	<4.2	0.9 N	384	<2.1	49.9	1,070
SS-10	2/21/2013	0.5	13,600	<2.2 N	5.4	150	1.1	<0.1	3,590	69.2	9.54	433	28,100	128	4,820	291	0.39	32.4	1,340	<4.3	<0.5 N	291	<2.2	50.8	213
SS-11	2/22/2013	0.5	13,500	4.9 N	13.3	203	1.0	<0.1	8,230	56.8	13.8	6,500	25,400	989	4,320	460	1.07	28.7	1,420	<4.1	0.6 N	309	<2.0	53.5	380
SS-12	2/22/2013	0.5	14,200	<2.4 N	4.3	130	1.0	0.4	6,910	21.8	11.0	450	23,300	151	4,040	478	0.21	16.0	2,200	<4.9	<0.6 N	290	<2.4	56.3	345
SS-13	2/22/2013	1.6-2	10,700	3.3 N	25.4	234	1.1	0.4	4,650	44.1	13.6	2,650	31,100	636	3,570	489	6.26	24.4	886	<3.8	0.5 N	326	<1.9	66.8	612
SS-18	2/21/2013	0.5	--	--	--	--	--	--	--	--	--	43.5	--	12.5	--	--	--	--	--	--	--	--	--	--	94.0
Applicable Screening Levels																									
Industrial EPA Region Removal Management Level, HQ = 3 <sup>9</sup>			3,000,000	1,200	240	570,000	6,000	2,400	--	4,600,000 <sup>14</sup>	910	120,000	2,100,000	800	--	68,000	130	59,000	--	15,000	15,000	--	31	--	920,000
Other Screening Levels																									
Residential EPA Region Removal Management Level, HQ = 3 <sup>9</sup>			230,000	94	61	46,000	470	210	--	350,000 <sup>14</sup>	70	9,400	160,000	400	--	5,500	30	4,600	--	1,200	1,200	--	2.3	--	7,000
EPA Region 3 Freshwater Sediment Benchmarks <sup>10</sup>			--	2	9.8	--	--	0.99	--	43.4	50	31.6	20,000	35.8	--	460	0.18	22.7	--	2	1.0	--	--	--	121
DEQ Construction Worker RBCs for Direct Contact <sup>11</sup>			--	--	13	60,000	610	150	--	460,000 <sup>14</sup>	--	12,000	--	800	--	7,200	93	6,100	--	--	1,500	--	--	--	--
DEQ Excavation Worker RBCs for Direct Contact <sup>11</sup>			--	--	370	>1,000,000	17,000	4,300	--	>1,000,000 <sup>14</sup>	--	340,000	--	800	--	200,000	2,600	170,000	--	--	43,000	--	--	--	--
EPA RSLs for Industrial Soil Direct Contact <sup>12</sup>			990,000	410	1.6	190,000	2,000	800	--	1,500,000 <sup>14</sup>	300	41,000	720,000	800	--	23,000	43	20,000	--	5,100	5,100	--	11	--	310,000
Background Concentrations																									
Oregon DEQ Default Background Metal Concentrations <sup>13</sup>			52,300 <sup>15</sup>	0.56	8.8	790	2.0	0.63	--	76	--	34	36,100 <sup>15</sup>	79	--	1,800	0.23	47	--	0.71	0.82	--	5.2	180	180

Please refer to notes at end of table.

Table 1  
Soil Sample Results - Metals  
Pier 99 - Pier West  
Removal Action Report

Sample ID	Date Sampled	Sample Depth (feet)	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc	
			mg/kg (ppm)																							
Removal Action Samples																										
REX-1	9/19/2013	2.5-3	--	2.2	--	--	--	3.00	--	28.6	--	1,460	--	129	--	--	--	22.3	--	--	--	--	--	--	741	
REX-2	9/19/2013	1-1.5	--	<1.07	--	--	--	2.15	--	14.5	--	393	--	56	--	--	--	13.7	--	--	--	--	--	--	276	
REX-3	9/19/2013	2.5-3	--	<1.07	--	--	--	0.256	--	7.02	--	22.1	--	12.6	--	--	--	8.73	--	--	--	--	--	--	45.5	
REX-4	9/25/2013	2.8-3.3	--	<1.13	--	--	--	0.158 J	--	10.9	--	8.99	--	3.82	--	--	--	11.5	--	--	--	--	--	--	45.7	
REX-5	9/25/2013	4.67-5.17	--	<1.09	--	--	--	0.174 J	--	7.34	--	9.85	--	4.15	--	--	--	9.29	--	--	--	--	--	--	50.7	
REX-6	9/25/2013	0.75-1.25	--	<1.10	--	--	--	0.21 J	--	14.1	--	28	--	6.75	--	--	--	13	--	--	--	--	--	--	82.4	
REX-7	9/25/2013	1-1.5	--	<1.07	--	--	--	0.213	--	8.01	--	15.4	--	25.5	--	--	--	9.8	--	--	--	--	--	--	78.6	
REX-8	9/25/2013	1.5-2	--	<1.23	--	--	--	<0.245	--	6.99	--	22.7	--	4.96	--	--	--	9.46	--	--	--	--	--	--	116	
REX-9	9/25/2013	1.8-2.3	--	<1.19	--	--	--	0.155 J	--	5.8	--	7.86	--	3.79	--	--	--	7.8	--	--	--	--	--	--	37.7	
REX-10	9/25/2013	1.5-2	--	<1.16	--	--	--	0.163 J	--	7.08	--	6.64	--	3.39	--	--	--	8.7	--	--	--	--	--	--	36.4	
REX-11	9/25/2013	1.8-2.3	--	<1.06	--	--	--	0.127 J	--	5.3	--	6.53	--	3.45	--	--	--	8.28	--	--	--	--	--	--	36.1	
REX-12	9/26/2013	0-0.5 <sup>17</sup>	--	1.98	--	--	--	0.702	--	17.4	--	438	--	129	--	--	--	15.4	--	--	--	--	--	--	342	
REX-13	9/26/2013	0-0.5 <sup>17</sup>	--	6.87	--	--	--	3.25	--	49.6	--	2,970	--	911	--	--	--	19.5	--	--	--	--	--	--	977	
REX-14	9/26/2013	0-0.5 <sup>17</sup>	--	<1.14	--	--	--	2.59	--	11.8	--	497	--	96	--	--	--	12.5	--	--	--	--	--	--	412	
REX-14 DUP	9/26/2013	0-0.5 <sup>17</sup>	--	0.663	--	--	--	2.02	--	14.5	--	473	--	103	--	--	--	15.3	--	--	--	--	--	--	433	
REX-15	10/1/2013	0-0.5 <sup>17</sup>	--	3.16	--	--	--	1.17	--	16.4	--	2,150	--	264	--	--	--	9.76	--	--	--	--	--	--	160	
REX-16	10/1/2013	0-0.5 <sup>17</sup>	--	--	9.72	157	--	18.1	--	46.1	--	--	--	1,060	--	--	0.486 <sup>H</sup>	--	--	<1.23	<1.11	--	--	--	--	
REX-17	10/4/2013	1-1.5 <sup>17</sup>	--	<0.592	--	--	--	0.261	--	5.78	--	126	--	23.8	--	--	--	9.14	--	--	--	--	--	--	46.3	
RAC-1	10/1/2013	0-0.5	--	0.609 J	--	--	--	1.33	--	11.9	--	28.6	--	26.7	--	--	--	14.9	--	--	--	--	--	--	144	
RAC-2	10/4/2013	0.5-1.0	--	14.5	--	--	--	6.93	--	113	--	7,900	--	2,300	--	--	--	28.3	--	--	--	--	--	--	1,500	
REX-18 Comp	6/30/2014	1.5 - 1.8	--	--	--	--	--	--	--	--	--	--	--	426	--	--	--	--	--	--	--	--	--	--	--	
REX-19 Comp	7/2/2014	1.5 - 1.8	--	--	--	--	--	--	--	--	--	--	--	950	--	--	--	--	--	--	--	--	--	--	--	
REX-20	7/2/2014	0.3-0.8	--	--	--	--	--	--	--	--	--	--	--	63.6	--	--	--	--	--	--	--	--	--	--	--	
REX-21 Comp	7/2/2014	1.5 - 1.8	--	--	--	--	--	--	--	--	--	--	--	2,820	--	--	--	--	--	--	--	--	--	--	--	
REX-22 Comp	7/2/2014	3-3.5	--	--	--	--	--	--	--	--	--	--	--	6,460	--	--	--	--	--	--	--	--	--	--	--	
Applicable Screening Levels																										
Industrial EPA Region Removal Management Level, HQ = 3 <sup>9</sup>			3,000,000	1,200	240	570,000	6,000	2,400	--	4,600,000 <sup>14</sup>	910	120,000	2,100,000	800	--	68,000	130	59,000	--	15,000	15,000	--	31	--	920,000	
Other Screening Levels																										
Residential EPA Region Removal Management Level, HQ = 3 <sup>9</sup>			230,000	94	61	46,000	470	210	--	350,000 <sup>14</sup>	70	9,400	160,000	400	--	5,500	30	4,600	--	1,200	1,200	--	2.3	--	7,000	
EPA Region 3 Freshwater Sediment Benchmarks <sup>10</sup>			--	2	9.8	--	--	0.99	--	43.4	50	31.6	20,000	35.8	--	460	0.18	22.7	--	2	1.0	--	--	--	121	
DEQ Construction Worker RBCs for Direct Contact <sup>11</sup>			--	--	13	60,000	610	150	--	460,000 <sup>14</sup>	--	12,000	--	800	--	7,200	93	6,100	--	--	1,500	--	--	--	--	
DEQ Excavation Worker RBCs for Direct Contact <sup>11</sup>			--	--	370	>1,000,000	17,000	4,300	--	>1,000,000 <sup>14</sup>	--	340,000	--	800	--	200,000	2,600	170,000	--	--	43,000	--	--	--	--	
EPA RSLs for Industrial Soil Direct Contact <sup>12</sup>			990,000	410	1.6	190,000	2,000	800	--	1,500,000 <sup>14</sup>	300	41,000	720,000	800	--	23,000	43	20,000	--	5,100	5,100	--	11	--	310,000	
Background Concentrations																										
Oregon DEQ Default Background Metal Concentrations <sup>13</sup>			52,300 <sup>15</sup>	0.56	8.8	790	2.0	0.63	--	76	--	34	36,100 <sup>15</sup>	79	--	1,800	0.23	47	--	0.71	0.82	--	5.2	180	180	

Notes:

1. Target Analyte List (TAL) metals analyzed per Environmental Protection Agency (EPA) Method 6010C Low Level (LL).
2. Mercury analyzed per per EPA Method 7471B.
3. mg/kg = milligrams per kilogram (parts per million).
4. Bold type indicates detected concentration above the Method Reporting Limit (MRL).
5. < = The analyte was not detected at or above the MRL.
6. \* = Matrix spike recovery (MS) or duplicate (MSD) outside limits based on heterogeneous samples. These data are not flagged as an estimated concentration.
7. N = Matrix spike recovery (MS) or duplicate (MSD) outside limits based on heterogeneous samples. These data are flagged as an estimated concentration.
8. -- = Not applicable or not analyzed.
9. EPA Region 4 Removal Management Levels (RMLs) , November 2012.
10. EPA Region 3 Freshwater Sediment SLVs from Mid-Atlantic Risk Assessment: Ecological Risk Assessment - Freshwater Sediment Screening Benchmarks, 2004.  
Note the 10x attenuation factor referenced in report text is not applied to the levels reported above.

11. DEQ RBCs from *Risk-Based Concentrations for Individual Chemicals*, June 2012.
12. EPA Regional Screening Levels (RSLs) for Industrial Soil from *Regional Screening Level (RSL) Summary Table* , updated November 2012.
13. Oregon DEQ Background Metal Concentrations (Portland Basin) from Background Levels of Metals in Soils for Cleanups, March 2013.
14. Chromium (III) concentration used for applicable screening level.
15. Oregon DEQ background metal concentration does not exist for specific metal, Clark County, Washington background metal concentration used.
16. Shaded cells represent detected concentrations that exceed the EPA Industrial RMLs.
17. Sample depths corresponds to the depth below the the average excavation leave surface because samples REX-12 through REX-17 were collected below surface accumulations of various thicknesses.
18. H = Analyses completed outside of recommended holding time.
19. J = Estimated Result . Result detected below the lowest point of the calibration curve, but above the specified MDL.
20. Strikethrough indicates samples that were removed during the removal action.

Table 2  
Soil Sampling Results - Butyltins and PCBs  
Pier 99 - Pier West  
Removal Action Report

Sample ID	Date Sampled	Sample Depth (feet)	Organotins				Polychlorinated Biphenyls										Total Detected PCBs
			Di-n-butyltin	n-Butyltin	Tetra-n-butyltin	Tri-n-butyltin	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	Aroclor 1268		
			µg/kg (ppb)														
Historical Samples																	
BK01SS	10/30/2008	0-0.5	36	36 JL	<3.6	48	--	--	--	--	<34	<34	--	--	--	0	
UP01SS	10/30/2008	0-0.5	210,000 JL	84,000	--	660,000	--	--	--	--	--	3800	--	--	--	3,800	
WS01SS	10/30/2008	0-0.5	210 JL	240	--	1100	--	--	--	--	--	130 JL	--	--	--	130	
WS02SS	10/30/2008	0-0.5	8,400 JL	3,200	--	24000	--	--	--	--	--	380 JL	--	--	--	380	
OP01SS	10/30/2008	0-0.5	<1.7	<1.7	<4.7	<1.7	--	--	--	--	<43	12 JQ	--	--	--	12	
OP02SS	10/30/2008	0-0.5	9,000 JL	7,500	190	36000	--	--	--	--	1200	1600	--	--	--	2,800	
OP03SS	10/30/2008	0-0.5	220	210	<4.7	28	--	--	--	--	<43	68 JL	--	--	--	68	
Gravel Filter Area																	
TP2 (1.5-2.0)	2/19/2013	1.5-2.0	29,000	6,900	<1,300	29,000	<10	<20	<10	<10	<10	400	130	<10	<10	530	
TP2 (4.5-5.0)	2/19/2013	4.5-5.0	9,600	3,000	<3,100	64,000	<9.9	<20	<9.9	<9.9	<9.9	160	70	<9.9	<9.9	230	
B-6 (8.5-10.0)	2/21/2013	8.5-10.0	--	--	--	--	<8.5	<17	<8.5	<8.5	<8.5	<8.5	<8.5	<8.5	<8.5	--	
B-8 (3.0-4.0)	2/21/2013	3.0-4.0	--	--	--	--	<10	<20	<10	<10	<10	<10	<10	<10	<10	--	
Former Crane Engine Pad																	
B-2 (7.0-8.0)	2/20/2013	7.0-8.0	78	20	3.3	760 D	<9.9	<20	<9.9	<9.9	<9.9	<9.9	52 P	<9.9	<9.9	52	
Bank																	
SS-9	2/21/2013	0.5	--	--	--	--	<9.4	<19	<9.4	<9.4	<9.4	610	420	<9.4	<9.4	1,030	
SS-10	2/21/2013	0.5	--	--	--	--	<9.9	<20	<9.9	<9.9	<9.9	27	38	<9.9	<9.9	65	
SS-11	2/22/2013	0.5	--	--	--	--	<97	<200	<97	<97	<97	950	<97	<97	<97	950	
SS-12	2/22/2013	0.5	--	--	--	--	<11	<21	<11	<11	<11	69	41	<11	<11	110	
SS-13	2/22/2013	1.6-2	--	--	--	--	<85	<170	<85	<85	<85	1,600	<85	<85	<85	1,600	
Removal Action Samples																	
REX-1	9/19/2013	0-0.5	62	340 E	<4.9	280	<11	<11	<11	<11	<11	50.8	34.6	<11	<11	85	
REX-2	9/19/2013	0-0.5	510 E	620 E	<4.5	1,000 E	<10.1	<10.1	<10.1	<10.1	<10.1	18	14.5	<10.1	<10.1	33	
REX-5	9/25/2013	4.67-5.17	<5.2	2.5 J	<4.5	<3.5	<10.3	<10.3	<10.3	<10.3	<10.3	<10.3	<10.3	<10.3	<10.3	0	
REX-9	9/25/2013	1.83-2.33	<5.3	<3.7	<4.6	<3.5	<10.2	<10.2	<10.2	<10.2	<10.2	<10.2	<10.2	<10.2	<10.2	0	
REX-15	10/1/2013	0-0.5 <sup>13</sup>	--	--	--	--	<52.1	<52.1	<78.2	<78.2	<52.1	554 EST	164 EST	<52.1	<52.1	718	
REX-17	10/4/2013	1-1.5 <sup>13</sup>	--	--	--	--	<10.0	<10.0	<10.0	<10.0	<10.0	36.8	36.3	<10.0	<10.0	73.1	
RAC-1	10/1/2013	0-0.5	--	--	--	--	<12.2	<12.2	<12.2	<12.2	<12.2	<12.2	<12.2	<12.2	<12.2	0	
RAC-2	10/4/2013	0.5-1.0	--	--	--	--	<277	<277	<277	<277	<277	15,500	2,950	<277	<277	18,450	
Applicable Screening Level Values																	
Industrial EPA Region Removal Management Level, HQ = 3			550,000	550,000	550,000	550,000	110,000	54,000	54,000	74,000	74,000	32,000	74,000	--	--	74,000	
Other Screening Level Values																	
Residential EPA Region Removal Management Level, HQ = 3			55,000	55,000	55,000	55,000	12,000	14,000	14,000	22,000	22,000	3,400	22,000	--	--	22,000	
PEL (MacDonald et al, 2000) <sup>9</sup>			--	--	--	--	--	--	--	--	--	340	--	--	--	277	
DEQ Construction Worker RBCs for Direct Contact			--	--	--	--	--	--	--	--	--	--	--	--	--	4,400	
DEQ Excavation Worker RBCs for Direct Contact			--	--	--	--	--	--	--	--	--	--	--	--	--	120,000	
EPA RSLs 9 Industrial Soil Direct Contact			180,000	180,000	180,000	180,000	21000	540	540	740	740	740	740	--	--	740	

Notes:

- Organotins analyzed per the Krone Method.
- Polychlorinated Biphenyls (PCBs) per Environmental Protection Agency (EPA) Method 8081B.
- µg/kg = = micrograms per kilogram (parts per billion).
- Bold type indicates detected concentration above the Method Reporting Limit (MRL)..
- < = The analyte was not detected at or above the MRL.
- = Not applicable or not analyzed.
- P = The confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results because of interference and the data are considered estimated values.
- EPA Region 4 Removal Management Levels (RMLs) , November 2012.
- MacDonalad et al., 2000; Development and Evaluation of Consensus-Based Sediment Quality Guideline for Freshwater Ecosystems. Environmental Contamination and Toxicity 39: 20-31.  
Note the 10x attenuation factor referenced in report text is not applied to levels reported above.
- DEQ RBCs from *Risk-Based Concentrations for Individual Chemicals*, June 2012.
- EPA Regional Screening Levels (RSLs) for Industrial Soil from *Regional Screening Level (RSL) Summary Table* , updated November 2012.
- Shaded cells represent detected concentrations that exceed the EPA Industrial RMLs.
- Sample depths corresponds to the depth below the the average excavation leave surface because samples REX-12 through REX-17 were collected below surface accumulations of various thicknesses.
- E =
- J = Estimated Result . Result detected below the lowest point of the calibration curve, but above the specified MDL.
- EST = Result reported as an Estimated Value. Multiple aroclors present and matrix interference.
- ~~Strikethrough~~ indicates samples that were removed during the removal action.

Table 3  
Soil Sampling Results - Organochlorine Pesticides  
Pier 99 - Pier West  
Removal Action Report

Sample ID	Date Sampled	Sample Depth (feet)	Organchlorine Pesticides																					
			alpha-BHC	beta-BHC	gamma-BHC	delta-BHC	Heptachlor	Aldrin	Heptachlor epoxide	gamma-Chlordane	Endosulfan I	alpha-Chlordane	Dieldrin	4,4'DDE	Endrin	Endosulfan II	4,4'DDD	Endrin Aldehyde	Endosulfan Sulfate	4,4'-DDT	Endrin Ketone	Methoxychlor	Chlordane	Toxaphene
			µg/kg (ppb)																					
Historical Samples																								
BK01SS	10/30/2008	0-0.5	--	--	--	--	--	--	<1.8	--	--	--	--	<3.4	--	--	0.39 JQ	--	--	1.2 JQ	--	--	--	--
UP01SS	10/30/2008	0-0.5	--	--	--	--	--	--	<210	--	--	--	--	--	--	--	2700	--	--	370	--	--	--	--
WS01SS	10/30/2008	0-0.5	--	--	--	--	--	--	4.5 JL	--	--	--	--	--	--	--	76	--	--	33 JL	--	--	--	--
WS02SS	10/30/2008	0-0.5	--	--	--	--	--	--	<18	--	--	--	--	--	--	--	32 JQ	--	--	33 JQ	--	--	--	--
OP01SS	10/30/2008	0-0.5	--	--	--	--	--	--	--	--	--	--	--	0.74 JQ	--	--	0.28 JQ	--	--	<4.3	--	--	--	--
OP02SS	10/30/2008	0-0.5	--	--	--	--	--	--	--	--	--	--	--	58	--	--	930	--	--	180 JL	--	--	--	--
OP03SS	10/30/2008	0-0.5	--	--	--	--	--	--	--	--	--	--	--	<4.3	--	--	8 JL	--	--	19	--	--	--	--
Gravel Filter Area																								
TP2 (1.5-2.0)	2/19/2013	1.5-2.0	<2.0	<2.0	<2.0	<2.5 i	<2.0	<2.0	<38 i	<3.3 i	<2.0	<2.0	<7.3 i	<2.8 i	<2.0	<8.1 i	51 P	<2.0	<2.0	<14 i	<2.1 i	<2.6 i	--	<390 i
TP2 (4.5-5.0)	2/19/2013	4.5-5.0	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<2.0 i	1.5 P	<0.99	<0.99	<2.0 i	<0.99	<0.99	<2.3 i	6.3	<0.99	<0.99	<6.5 i	<0.99	<1.6 i	--	<110 i
B-8 (3.0-4.0)	2/21/2013	3.0-4.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	<50	
Former Crane Engine Pad																								
B-2 (7.0-8.0)	2/20/2013	7.0-8.0	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	1.2	<0.99	<0.99	<0.99	<0.99	<0.99	9.7	<0.99	<1.6 i	--	<200 i
Bank																								
SS-9	2/21/2013	0.5	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<21 i	<6.8 i	<1.9	<1.9	<10 i	44	<1.9	<8.8 i	390	<1.9	45	310	<2.0 i	<13 i	--	<1,200 i
SS-10	2/21/2013	0.5	<0.99	<0.99	<0.99	<0.99	1.2 P	<0.99	<0.99	<0.99	<2.5 i	<0.99	2.2 P	<0.99	<0.99	<1.1 i	2.4	<0.99	<0.99	<9.3 i	<0.99	<0.99	--	<59 i
SS-11	2/22/2013	0.5	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<12 i	12 P	<4.9	<4.9	<17 i	16 P	<4.9	<19 i	170	<4.9	11	130	<4.9	5.5 P	--	<720 i
SS-12	2/22/2013	0.5	1.8 P	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.2 i	1.6	<1.1	<1.8 i	1.4 P	<1.1	<1.4 i	12 i	<1.5 i	<1.1	--	<72 i
SS-13	2/22/2013	1.6-2	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<3.4 i	16 P	<4.3 i	<1.7	<26 i	99	<2.4 i	<5.3 i	1,300	<1.7	100	1,600	<6.8 i	<6.5 i	--	<750 i
Removal Action Samples																								
REX-1	9/19/2013	0-0.5	<22.3	<22.3	<22.3	<22.3	<22.3	<22.3	<22.3	<22.3	<22.3	<22.3	<22.3	<22.3	<22.3	<22.3	35.3	<22.3	<22.3	104	<22.3	<67	<670	<670
REX-2	9/19/2013	0-0.5	<4.21	<4.21	<4.21	<4.21	<4.21	<4.21	<4.21	<4.21	<4.21	<4.21	<4.21	<4.21	<4.21	<4.21	15.1	<4.21	<4.21	4.51	<4.21	<12.6	<126	<126
REX-5	9/25/2013	4.67-5.17	<1.62	<1.62	<1.62	<1.62	<1.62	<1.62	<1.62	<1.62	<1.62	<1.62	<1.62	<1.62	<1.62	<1.62	<1.62	<1.62	<1.62	<1.62	<1.62	<4.85	<48.5	<48.5
REX-9	9/25/2013	1.83-2.33	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<1.77	<5.31	<53.1	<53.1
REX-15 <sup>13</sup>	10/1/2013	0-0.5	<20.5	<20.5	<20.5	<20.5	<20.5	<20.5	28.5	<20.5	<20.5	<20.5	<20.5	<24.5	<20.5	<20.5	209	<20.5	<20.5	347	<20.5	<61.4	<614	<614
REX-16 <sup>13+H</sup>	10/1/2013	0-0.5	<19.2	<19.2	<19.2	<19.2	<19.2	<19.2	<19.2	<19.2	<19.2	<19.2	<19.2	<19.2	<19.2	<19.2	<19.2	<19.2	<19.2	<34.6	<19.2	<67.6	<676	<676
Applicable Screening Level Values																								
Industrial EPA Region Removal Management Level, HQ = 3 <sup>8</sup>			27,000	96,000	210,000	--	38,000	10,000	19,000	--	11,000,000	--	11,000	510,000	550,000	11,000,000	720,000	--	--	700,000	--	9,200,000	650,000	160,000
Other Screening Level Values																								
Residential EPA Region Removal Management Level, HQ = 3 <sup>8</sup>			7,700	27,000	52,000	--	11,000	2,900	2,400	--	1,100,000	--	3,000	140,000	55,000	--	200,000	--	--	170,000	--	920,000	110,000	44,000
EPA Region 3 Freshwater Sediment Benchmarks <sup>9</sup>			6	5	2.37	6,400	68	2	2.47	3.24	2.9	3.24	1.9	3.16	2.22	14	4.88	--	5.4	4.16	--	18.7	3.24	0.1
DEQ Construction Worker RBCs for Direct Contact <sup>10</sup>			2,600	--	15,000	--	3,700	950	1,800	55,000	1,400,000	55,000	1,000	58,000	71,000	1,400,000	83,000	--	--	58,000	--	--	55,000	15,000
DEQ Excavation Worker RBCs for Direct Contact <sup>10</sup>			71,000	--	400,000	--	100,000	26,000	51,000	1,500,000	40,000,000	1,500,000	29,000	1,600,000	2,000,000	40,000,000	2,300,000	--	--	1,600,000	--	--	1,500,000	420,000
EPA RSLs Industrial Soil Direct Contact <sup>11</sup>			270	960	2,100	--	380	100	190	6,500,000	3,700,000	6,500	110	5,100	180,000	3,700,000	7,200	--	--	7,000	--	3,100,000	6,500	16,000

**Notes:**

1. Organochlorine pesticides per Environmental Protection Agency (EPA) Method 8081B.

2. µg/kg = = micrograms per kilogram (parts per billion).

3. Bold type indicates detected concentration above the Method Reporting Limit (MRL)..

4. < = The analyte was not detected at or above the MRL.

5. -- = Not applicable or not analyzed.

6. i = Elevated due to chromatographic interference.

7. P = The confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results and the data is considered estimated.

8. EPA Region 4 Removal Management Levels (RMLs) , November 2012.

9. EPA Region 3 Freshwater Sediment SLVs from Mid-Atlantic Risk Assessment: Ecological Risk Assessment - Freshwater Sediment Screening Benchmarks, 2004.  
Note the 10x attenuation factor referenced in report text is not applied to the levels.

10. DEQ RBCs from *Risk-Based Concentrations for Individual Chemicals*, June 2012.

11. EPA Regional Screening Levels (RSLs) for Industrial Soil from *Regional Screening Level (RSL) Summary Table* , updated November 2012.

12. Shaded cells represent detected concentrations that exceed the EPA Industrial RMLs.

13. Sample depths corresponds to the depth below the the average excavation leave surface because samples REX-12 through REX-17 were collected below surface accumulations of various thicknesses.

14. H = Analyses completed outside of recommended holding time.

15. Strikethrough indicates samples that were removed during the removal action.

Table 4  
Soil Sampling Results - SVOCs  
Pier 99 - Pier West  
Removal Action Report

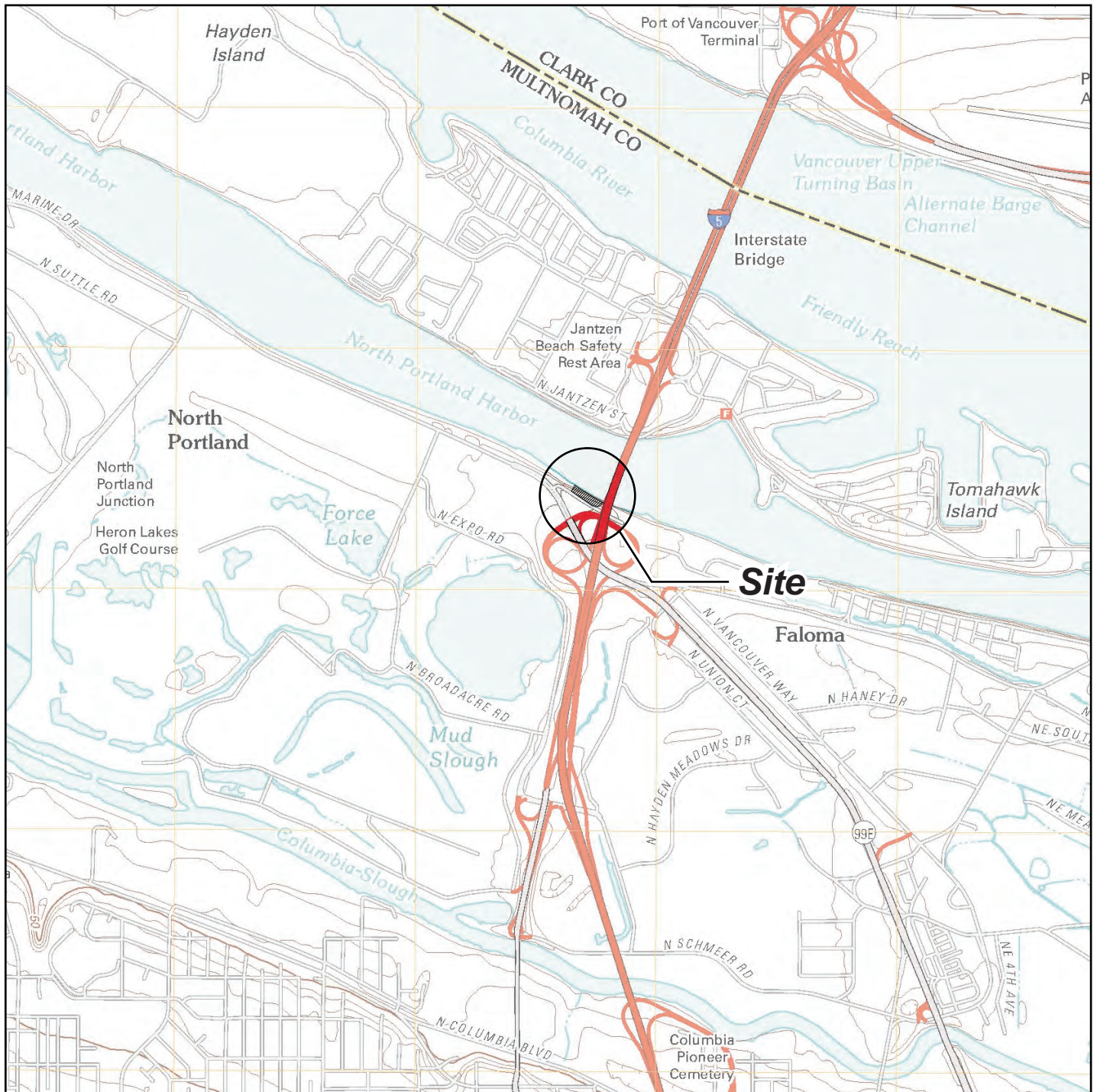
Location	Historical samples							Former Crane Engine Pad	Bank					Removal Action Samples							Applicable Screening Level Values	Relevant Screening Level Values					
	Sample ID	BK01SS	UP01SS	WS01SS	WS02SS	OP01SS	OP02SS	OP03SS	B-2 (7.0-8.0)	SS-9	SS-10	SS-11	SS-12	SS-13	REX-1	REX-2	REX-5	REX-9	REX-15	REX-16	RAC-1	Industrial EPA Region Removal Management Level, HQ = 3 <sup>7</sup>	Residential EPA Region Removal Management Level, HQ = 3 <sup>7</sup>	EPA Region 3 Freshwater Sediment Benchmarks <sup>8</sup>	DEQ Construction Worker RBCs for Direct Contact <sup>9</sup>	DEQ Excavation Worker RBCs for Direct Contact <sup>9</sup>	EPA RSLs Industrial Soil Direct Contact <sup>10</sup>
	Date Sampled	10/30/08	10/30/08	10/30/08	10/30/08	10/30/08	10/30/08	10/30/08	2/20/13	2/21/13	2/21/13	2/22/13	2/22/13	2/22/13	9/19/13	9/19/13	9/25/13	9/25/13	10/1/13	10/1/13	10/1/13						
Sample Depth (feet)	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	7.0-8.0	0.5	0.5	0.5	0.5	1.6-2	0-0.5	0-0.5	4.67-5.17	1.83-2.33	0-0.5 <sup>13</sup>	0-0.5 <sup>13</sup>	0-0.5						
Analyte																											
Bis(2-chloroethyl) Ether	14 JQ (180 SQL)	3,100	74 JQ	680 JQ	49 JQ	2,200	55 JQ	<150	<150	<150	560	<150	<750	<399	<59.7	<8.43	<8.7	869	<296	--	100,000	21,000	--	--	--	--	1,000
Phenol	--	--	--	--	--	--	--	<49	<50	<50	<50	<50	<250	<570	<85.4	<16.9	<17.4	<203	<493	--	550,000,000	55,000,000	420	--	--	180,000,000	
2-Chlorophenol	--	--	--	--	--	--	--	<49	<50	<50	<50	<50	<250	<570	<85.4	<16.9	<17.4	<203	<493	--	37,000,000	3,700,000	31.2	--	--	5,100,000	
1,3-Dichlorobenzene	--	--	--	--	--	--	--	<49	<50	<50	<50	<50	<250	--	--	--	--	--	--	--	--	--	4,430	--	--	--	
1,4-Dichlorobenzene	--	--	--	--	--	--	--	<49	<50	<50	<50	<50	<250	--	--	--	--	--	--	--	1,200,000	240,000	599	1,200,000	34,000,000	12,000	
1,2-Dichlorobenzene	--	--	--	--	--	--	--	<49	<50	<50	<50	<50	<250	--	--	--	--	--	--	--	30,000,000	5,700,000	16.5	19,000,000	520,000,000	9,800,000	
Benzyl Alcohol	--	--	--	--	--	--	--	<98	<100	<100	4,500	<99	<500	--	--	--	--	--	--	--	180,000,000	18,000,000	--	--	--	62,000,000	
Bis(2-chloroisopropyl) Ether	--	--	--	--	--	--	--	<49	<50	<50	<50	<50	<250	--	--	--	--	--	--	--	--	--	--	--	--	--	
2-Methylphenol	--	--	--	--	--	--	--	<49	<50	<50	<50	<50	<250	<285	<42.7	<8.43	<8.7	<102	<246	--	92,000,000	9,200,000	--	--	--	31,000,000	
Hexachloroethane	--	--	--	--	--	--	--	<49	<50	<50	<50	<50	<250	--	--	--	--	--	--	--	1,300,000	130,000	1,027	240,000	6,600,000	43,000	
N-Nitrosodi-n-propylamine	--	--	--	--	--	--	--	<49	<50	<50	<50	<50	<250	--	--	--	--	--	--	--	25,000	--	--	--	--	250	
4-Methylphenol	--	--	--	--	--	--	--	<49	90	<50	190	<50	<250	<285	<42.7	<8.43	<8.7	<102	<246	--	180,000,000	18,000,000	670	--	--	62,000,000	
Nitrobenzene	--	--	--	--	--	--	--	<49	<50	<50	<50	<50	<250	--	--	--	--	--	--	--	2,400,000	390,000	--	--	--	24,000	
Isophorone	--	--	--	--	--	--	--	<49	<50	<50	<50	<50	<250	--	--	--	--	--	--	--	180,000,000	37,000,000	--	--	--	1,800,000	
2-Nitrophenol	--	--	--	--	--	--	--	<49	<50	<50	<50	<50	<250	<1,140	<171	<33.7	<34.8	<407	<986	--	--	--	--	--	--	--	
2,4-Dimethylphenol	--	--	--	--	--	--	--	<250	<250	<250	<250	<250	<1,300	<570	<85.4	<16.9	<17.4	<203	<493	--	37,000,000	3,700,000	29	--	--	12,000,000	
Bis(2-chloroethoxy)methane	--	--	--	--	--	--	--	<49	<50	<50	<50	<50	<250	--	--	--	--	--	--	--	5,500,000	550,000	--	--	--	1,800,000	
2,4-Dichlorophenol	--	--	--	--	--	--	--	<49	<50	<50	<50	<50	<250	<570	<85.4	<16.9	<17.4	<230	<493	--	5,500,000	550,000	117	--	--	1,800,000	
Benzoic Acid	--	--	--	--	--	--	--	<1,000	<1,000	<1,000	<1,000	<1,000	<5,000	--	--	--	--	--	--	--	7,400,000,000	730,000,000	650	--	--	2,500,000,000	
1,2,4-Trichlorobenzene	--	--	--	--	--	--	--	<49	<50	<50	<50	<50	<250	--	--	--	--	--	--	--	820,000	190,000	2,100	--	--	99,000	
Naphthalene	--	--	--	--	--	--	--	6.6	76	6.4	18	8.7	36	<228	<34.1	<6.74	<6.96	<81.3	<197	11.3	1,800,000	360,000	176	580,000	16,000,000	18,000	
4-Chloroaniline	--	--	--	--	--	--	--	<50	<50	<50	<50	<50	<250	--	--	--	--	--	--	--	860,000	240,000	--	--	--	8,600	
Hexachlorobutadiene	--	--	--	--	--	--	--	<49	<50	<50	<50	<50	<250	--	--	--	--	--	--	--	1,800,000	180,000	--	--	--	22,000	
4-Chloro-3-methylphenol	--	--	--	--	--	--	--	<49	<50	<50	<50	<50	<250	<1,140	<171	<33.7	<34.8	<407	<986	--	180,000,000	18,000,000	--	--	--	62,000,000	
1-Methylnaphthalene	--	--	--	--	--	--	--	--	--	--	--	--	--	<228	<34.1	6.8	<6.96	<81.3	<197	<10.6	5,300,000	1,600,000	--	--	--	--	
2-Methylnaphthalene	--	--	--	--	--	--	--	<5.0	31	4.7	13	10	23	<228	<34.1	10	<6.96	<81.3	<197	<10.6	6,600,000	690,000	20.2	--	--	2,200,000	
Hexachlorocyclopentadiene	--	--	--	--	--	--	--	<250	<250	<250	<250	<250	<1,300	--	--	--	--	--	--	--	11,000,000	1,100,000	--	--	--	3,700,000	
2,4,6-Trichlorophenol	--	--	--	--	--	--	--	<49	<50	<50	<50	<50	<250	<570	<85.4	<16.9	<17.4	<203	<493	--	1,800,000	180,000	213	240,000	6,600,000	160,000	
2,4,5-Trichlorophenol	--	--	--	--	--	--	--	<49	<50	<50	<50	<50	<250	<570	<85.4	<16.9	<17.4	<203	<493	--	180,000,000	18,000,000	--	--	--	62,000,000	
2-Chloronaphthalene	--	--	--	--	--	--	--	<49	<50	<50	<50	<50	<250	--	--	--	--	--	--	--	250,000,000	19,000,000	--	--	--	82,000,000	
2-Nitroaniline	--	--	--	--	--	--	--	<98	<100	<100	<100	<99	<500	--	--	--	--	--	--	--	18,000,000	1,800,000	--	--	--	6,000,000	
Acenaphthalene	--	--	--	--	--	--	--	13	5.5	<3.7	7.9	<4.1	22	<114	<17.1	<3.37	<3.48	<40.7	<98.6	<10.6	--	--	5.9	--	--	--	
Dimethylphthalate	200	48,000	660	17,000	8.6 JQ	21,000	99 JQ	<49	690	450	7,500	530	990	<1,140	410	<33.7	<34.8	2,840	<986	--	--	--	--	--	--	--	
2,6-Dinitrotoluene	--	--	--	--	--	--	--	<49	<50	<50	<50	<50	<250	--	--	--	--	--	--	--	120,000	33,000	--	240,000	6,600,000	620,000	
Acenaphthene	--	--	--	--	--	--	--	<5.0	9.2	6.4	16	11	13	<114	<17.1	<3.37	<3.48	<40.7	<98.6	<10.6	99,000,000	10,000,000	6.7	19,000,000	520,000,000	33,000,000	
3-Nitroaniline	--	--	--	--	--	--	--	<98	<100	<100	<100	<99	<500	--	--	--	--	--	--	--	--	--	--	--	--	--	
2,4-Dinitrophenol	--	--	--	--	--	--	--	<1,000	<1,000	<1,000	<1,000	<1000	<5,000	<2,280	<341	<67.4	<69.6	<813	<2,020	--	3,700,000	370,000	--	--	--	1,200,000	
Dibenzofuran	--	--	--	--	--	--	--	<5.0	11	<3.7	8.7	4.5	14	<114	<17.1	<3.37	<3.48	<40.7	<98.6	<10.6	3,100,000	230,000	415	--	--	1,000,000	
4-Nitrophenol	--	--	--	--	--	--	--	<490	<500	<500	<500	<500	<2,500	<1,140	<171	<33.7	<34.8	<407	<986	--	--	--	--	--	--	--	
2,4-Dinitrotoluene	--	--	--	--	--	--	--	<49	<50	<50	<50	<50	<250	--	--	--	--	--	--	--	550,000	160,000	41.6	--	--	5,500	
Fluorene	--	--	--	--	--	--	--	<5.0	7.4																		

Table 4  
Soil Sampling Results - SVOCs  
Pier 99 - Pier West  
Removal Action Report

Location  Sample ID  Date Sampled  Sample Depth (feet)	Historical samples							Former Crane Engine Pad	Bank					Removal Action Samples							Applicable Screening Level Values	Relevant Screening Level Values				
	BK01SS	WP01SS	WS01SS	WS02SS	OP01SS	OP02SS	OP03SS	B-2 (7.0-8.0)	SS-9	SS-10	SS-11	SS-12	SS-13	REX-1	REX-2	REX-5	REX-9	REX-15	REX-16	RAC-1	Industrial EPA Region Removal Management Level, HQ = 3 <sup>7</sup>	Residential EPA Region Removal Management Level, HQ = 3 <sup>7</sup>	EPA Region 3 Freshwater Sediment Benchmarks <sup>8</sup>	DEQ Construction Worker RBC's for Direct Contact <sup>9</sup>	DEQ Excavation Worker RBCs for Direct Contact <sup>9</sup>	EPA RSLs Industrial Soil Direct Contact <sup>10</sup>
	10/30/08	10/30/08	10/30/08	10/30/08	10/30/08	10/30/08	10/30/08	2/20/13	2/21/13	2/21/13	2/22/13	2/22/13	2/22/13	9/19/13	9/19/13	9/25/13	9/25/13	10/1/13	10/1/13	10/1/13						
	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	7.0-8.0	0.5	0.5	0.5	0.5	1.6-2	0-0.5	0-0.5	4.67-5.17	1.83-2.33	0-0.5 <sup>13</sup>	0-0.5 <sup>13</sup>	0-0.5						
Analyte																										
µg/kg																										
Anthracene	--	--	--	--	--	--	--	17	18	12	26	20	37	<114	<17.1	<3.37	<3.48	<40.7	498.6	<10.6	500,000,000	52,000,000	57.2	93,000,000	>1,000,000,000	170,000,000
Di-n-butylphthalate	22 JQ (180 SQL)	26,000	160 JQ	52,000	7.7 JQ	2100	22 JQ	<98	<100	4100	1,400	<99	<500	<1,140	253	<33.7	<34.8	482	498.6	--	180,000,000	18,000,000	6,470	--	--	62,000,000
Fluoranthene	71 JQ (180 SQL)	--	--	--	66 JQ	2500	65 JQ	110	200	120	300	210	270	<114	41.3	<3.37	<3.48	133	498.6	12.9	66,000,000	6,900,000	423	8,900,000	250,000,000	22,000,000
Pyrene	--	--	--	--	--	--	--	150	190	120	200	200	260	124	44.8	<3.37	<3.48	123	498.6	13.7	50,000,000	5,200,000	195	6,700,000	190,000,000	17,000,000
Butyl Benzyl Phthalate	15 JQ (180 SQL)	--	--	--	<220	2200	17 JQ	<49	61	62	470	150	<250	<1,140	<171	<33.7	<34.8	<1,630	498.6	--	91,000,000	26,000,000	10,900	--	--	910,000
3,3'-Dichlorobenzidine	--	--	--	--	--	--	--	<490	<500	500	500	<500	<2,500	--	--	--	--	--	--	--	380,000	110,000	127	37,000	1,000,000	3,800
Benzo(a)anthracene	--	--	--	--	--	--	--	62	88	74	190	120	120	<114	26.8	<3.37	<3.48	<163	498.6	<10.6	210,000	15,000	108	21,000	590,000	2,100
Chrysene	--	--	--	--	--	--	--	75	160	110	200	150	220	136	36.4	<3.37	<3.48	<163	498.6	<10.6	21,000,000	1,500,000	166	2,100,000	57,000,000	210,000
Bis(2-ethylhexyl) Phthalate	93 JQ (180 SQL)	11,000	210 JQ	5,100	45 JQ	6400	160 JQ	<490	<500	500	2,500	<500	3,400	<1,140	207	<33.7	<34.8	<1,630	498.6	--	12,000,000	3,500,000	180	1,200,000	33,000,000	120,000
Di-n-octyl Phthalate	--	--	--	--	--	--	--	<49	<50	50	450	<50	<250	<2,280	<341	<67.4	<69.6	<3,250	41,970	--	18,000,000	1,800,000	--	--	--	7,400,000
Benzo(b)fluoranthene	--	--	--	--	--	--	--	78	170	140	420	180	280	<171	56.6	<5.06	<5.22	244	4140	<21.2 <sup>6</sup>	210,000	15,000	27.2	21,000	590,000	2,100
Benzo(k)fluoranthene	--	--	--	--	--	--	--	33	63	53	140	73	93	<171	<25.6	<5.06	<5.22	<244	4140	--	2,100,000	150,000	240	210,000	5,900,000	21,000
Benzo(a)pyrene	--	--	--	--	--	--	--	88	110	93	260	160	190	<171	46.2	<5.06	<5.22	<244	4140	<10.6	21,000	1,500	150	2,100	59,000	210
Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	--	83	130	100	200	140	290	<114	<171	<3.37	<3.48	<163	498.6	11.7	210,000	15,000	17	21,000	590,000	2,100
Dibenz(a,h)anthracene	--	--	--	--	--	--	--	16	32	23	60	31	64	<114	<171	<3.37	<3.48	<163	--	<10.6	21,000	1,500	33	2,100	59,000	210
Benzo(g,h,i)perylene	--	--	--	--	--	--	--	81	130	92	250	130	270	<114	<171	<3.37	<3.48	<163	100	16.3	--	--	170	--	--	--
Carbazole	--	--	--	--	--	--	--	--	--	--	--	--	--	<171	<25.6	<5.06	<5.22	<61.0	4140	--	--	--	--	--	--	--
2,3,4,6-Tetrachlorophenol	--	--	--	--	--	--	--	--	--	--	--	--	--	<570	<85.4	<16.9	<17.4	<203	4492	--	55,000,000	5,500,000	284	--	--	18,000,000
Benzaldehyde	43 JQ (180 SQL)	4,600 JH	140 JQ	2,000 JH	230 JH	3,000 JH	240 JH	--	--	--	--	--	--	--	--	--	--	--	--	--	310,000,000	23,000,000	--	--	--	--

Notes:

- Semivolatile organic compounds (SVOCs) per Environmental Protection Agency (EPA) Method 8270D.
- µg/kg = micrograms per kilogram (parts per billion).
- Bold type indicates detected concentration above the Method Reporting Limit (MRL)..
- < = The analyte was not detected at or above the MRL.
- = Not applicable or not analyzed.
- Benzo(b)fluoranthene and Benzo(k)fluoranthene could not be adequately resolved due to matrix interference. The analytes were integrated together and reported as Benzo(b)fluoranthene.
- EPA Region 4 Removal Management Levels (RMLs) , November 2012.
- EPA Region 3 Freshwater Sediment SLVs from Mid-Atlantic Risk Assessment: Ecological Risk Assessment - Freshwater Sediment Screening Benchmarks, January 2004. Note the 10x attenuation factor referenced in report text is not applied to the levels.
- DEQ RBCs from *Risk-Based Concentrations for Individual Chemicals*, June 2012.
- EPA Regional Screening Levels (RSLs) for Industrial Soil from *Regional Screening Level (RSL) Summary Table* , updated November 2012.
- Shaded cells represent detected concentrations that exceed the EPA Industrial RMLs.
- Sample depths corresponds to the depth below the the average excavation leave surface because samples REX-12 through REX-17 were collected below surface accumulations of various thicknesses.
- ~~Strike through~~ indicates samples that were removed during the removal action.



**Note:** Base map prepared from USGS 7.5-minute quadrangle of Portland, OR, dated 2011 as provided by USGS.gov.

0 2,000 4,000  
Approximate Scale in Feet



## Site Location Map

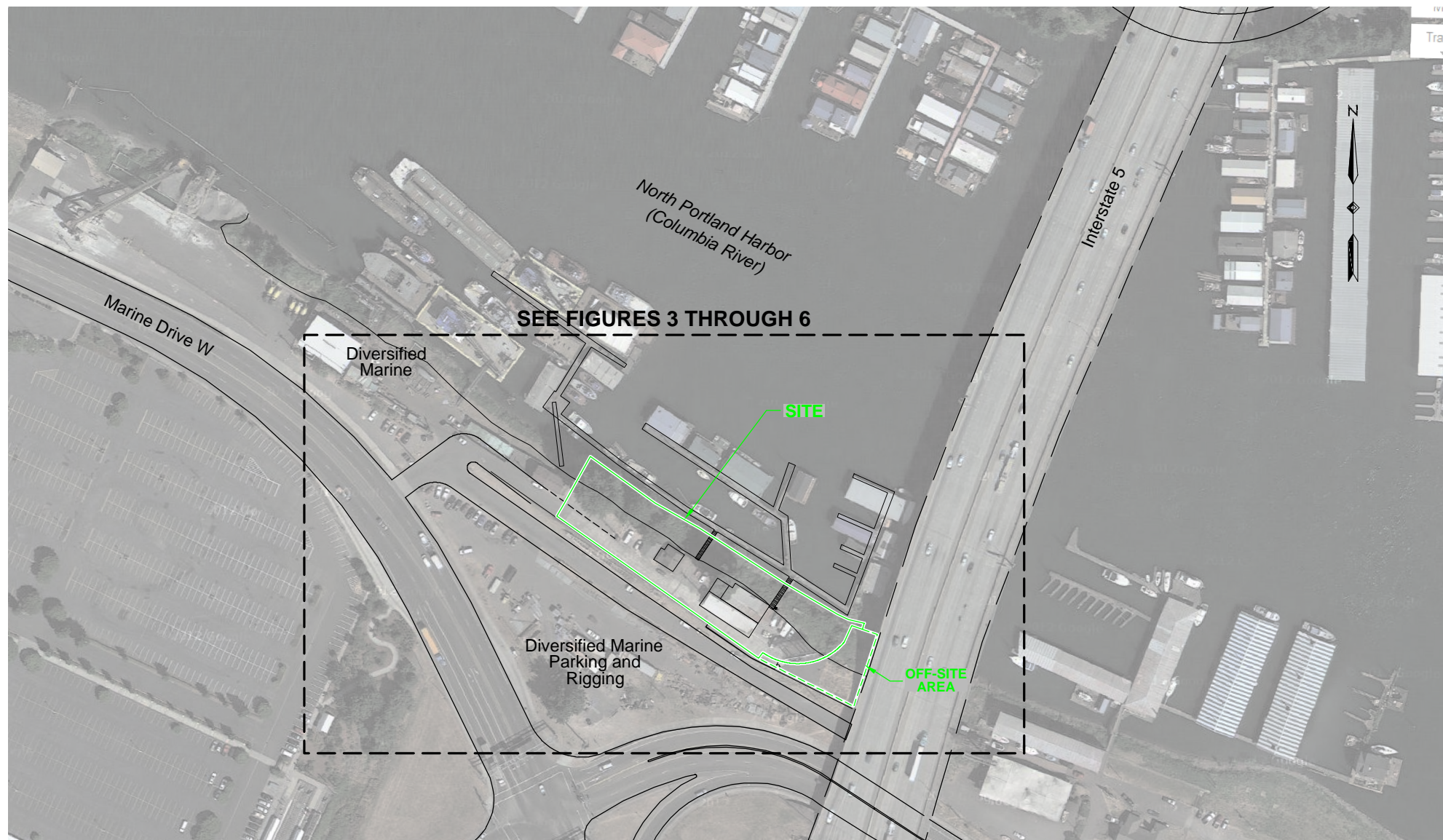
Removal Action Report  
Pier 99 – Portland Site  
Portland, Oregon



Apex Companies, LLC  
3015 SW First Avenue  
Portland, Oregon 97201

Project Number	1975-00
September 2014	

Figure  
1



0 200 400  
Scale in Feet

**Note:** Base map prepared from Google Maps (aerial dated August 2012) and tax lot boundaries from City of Portland datasets (2010).

## Site Vicinity Plan

Removal Action Report  
Pier 99 - Pier West  
Portland, Oregon



Apex Companies, LLC  
3015 SW First Avenue  
Portland, Oregon 97201

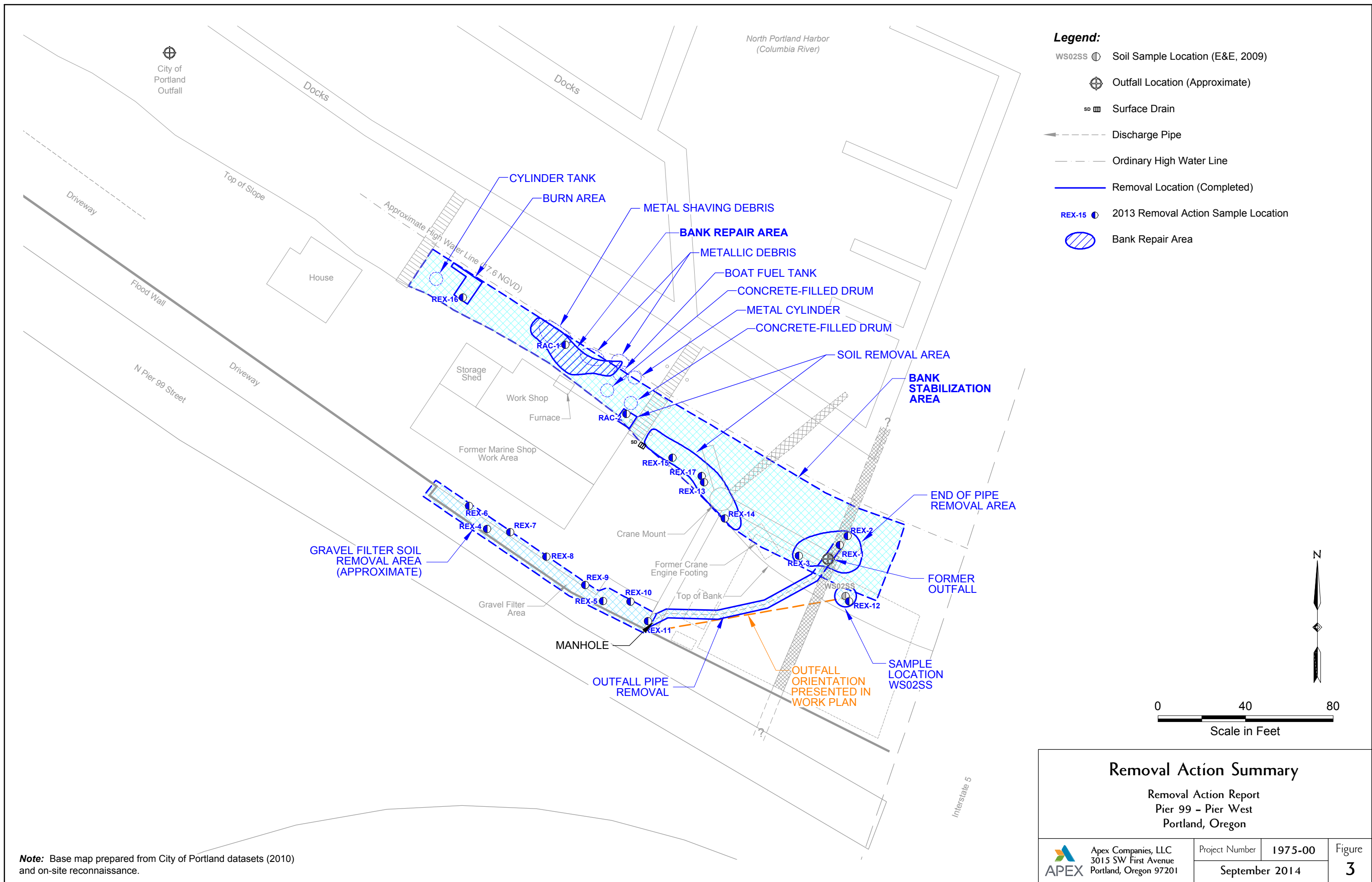
Project Number

1975-00

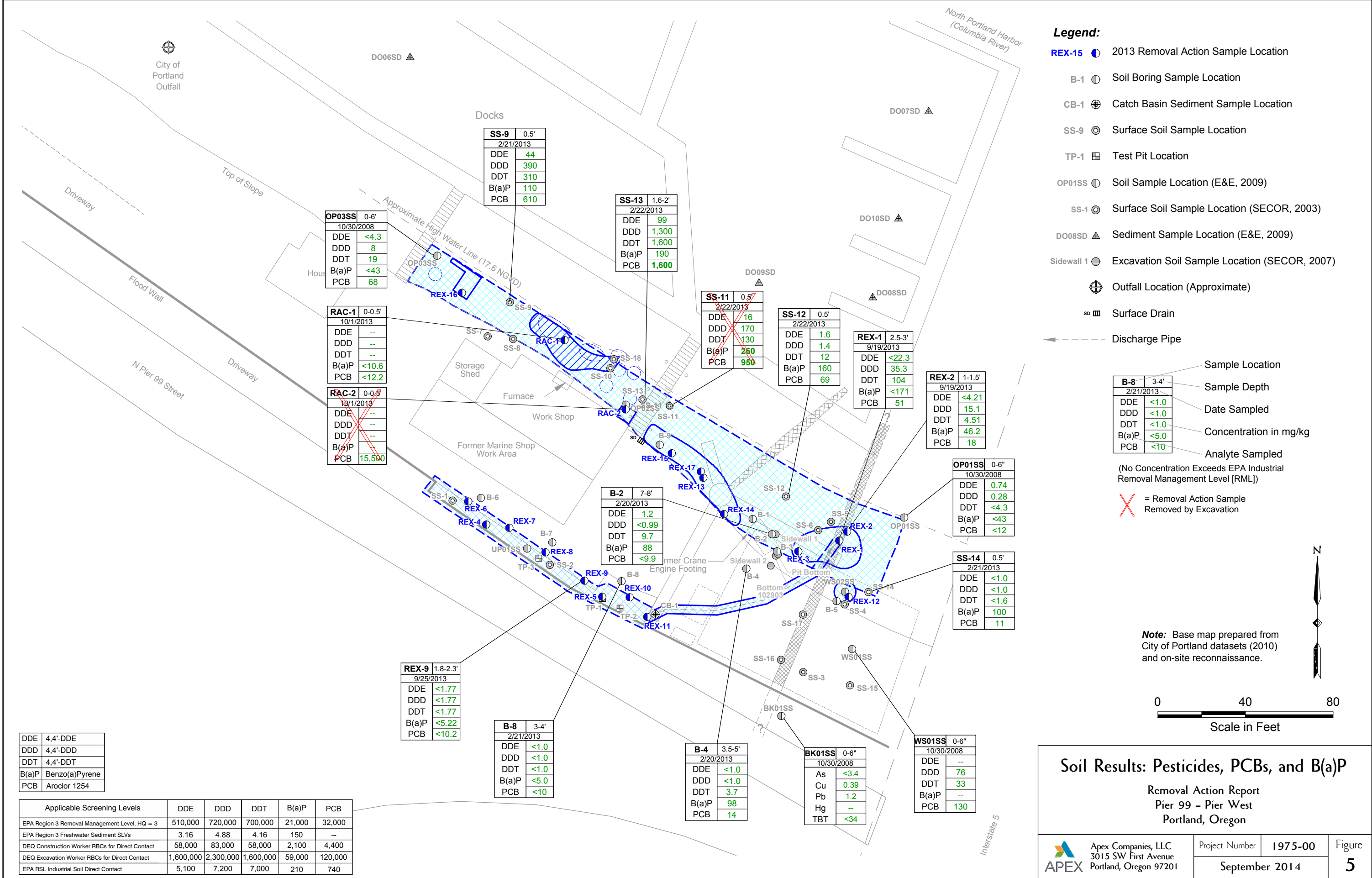
September 2014

Figure

2







DDE	4,4'-DDE
DDD	4,4'-DDD
DDT	4,4'-DDT
B(a)P	Benzo(a)Pyrene
PCB	Aroclor 1254

Applicable Screening Levels	DDE	DDD	DDT	B(a)P	PCB
EPA Region 3 Removal Management Level, HQ = 3	510,000	720,000	700,000	21,000	32,000
EPA Region 3 Freshwater Sediment SLVs	3.16	4.88	4.16	150	--
DEQ Construction Worker RBCs for Direct Contact	58,000	83,000	58,000	2,100	4,400
DEQ Excavation Worker RBCs for Direct Contact	1,600,000	2,300,000	1,600,000	59,000	120,000
EPA RSL Industrial Soil Direct Contact	5,100	7,200	7,000	210	740

OP03SS	0-6"
10/30/2008	
DDE	<4.3
DDD	8
DDT	19
B(a)P	<43
PCB	68

RAC-1	0-0.5'
10/1/2013	
DDE	--
DDD	--
DDT	--
B(a)P	<10.6
PCB	<12.2

RAC-2	0-0.5'
10/1/2013	
DDE	--
DDD	--
DDT	--
B(a)P	<15.500
PCB	--

REX-9	1.8-2.3'
9/25/2013	
DDE	<1.77
DDD	<1.77
DDT	<1.77
B(a)P	<5.22
PCB	<10.2

B-8	3-4'
2/21/2013	
DDE	<1.0
DDD	<1.0
DDT	<1.0
B(a)P	<5.0
PCB	<10

SS-9	0.5'
2/21/2013	
DDE	44
DDD	390
DDT	310
B(a)P	110
PCB	610

SS-13	1.6-2'
2/22/2013	
DDE	99
DDD	1,300
DDT	1,600
B(a)P	190
PCB	1,600

B-2	7-8'
2/20/2013	
DDE	1.2
DDD	<0.99
DDT	9.7
B(a)P	88
PCB	<9.9

B-4	3.5-5'
2/20/2013	
DDE	<1.0
DDD	<1.0
DDT	3.7
B(a)P	98
PCB	14

SS-11	0.5'
2/22/2013	
DDE	16
DDD	170
DDT	130
B(a)P	260
PCB	950

SS-12	0.5'
2/22/2013	
DDE	1.6
DDD	1.4
DDT	12
B(a)P	160
PCB	69

REX-1	2.5-3'
9/19/2013	
DDE	<22.3
DDD	35.3
DDT	104
B(a)P	<171
PCB	51

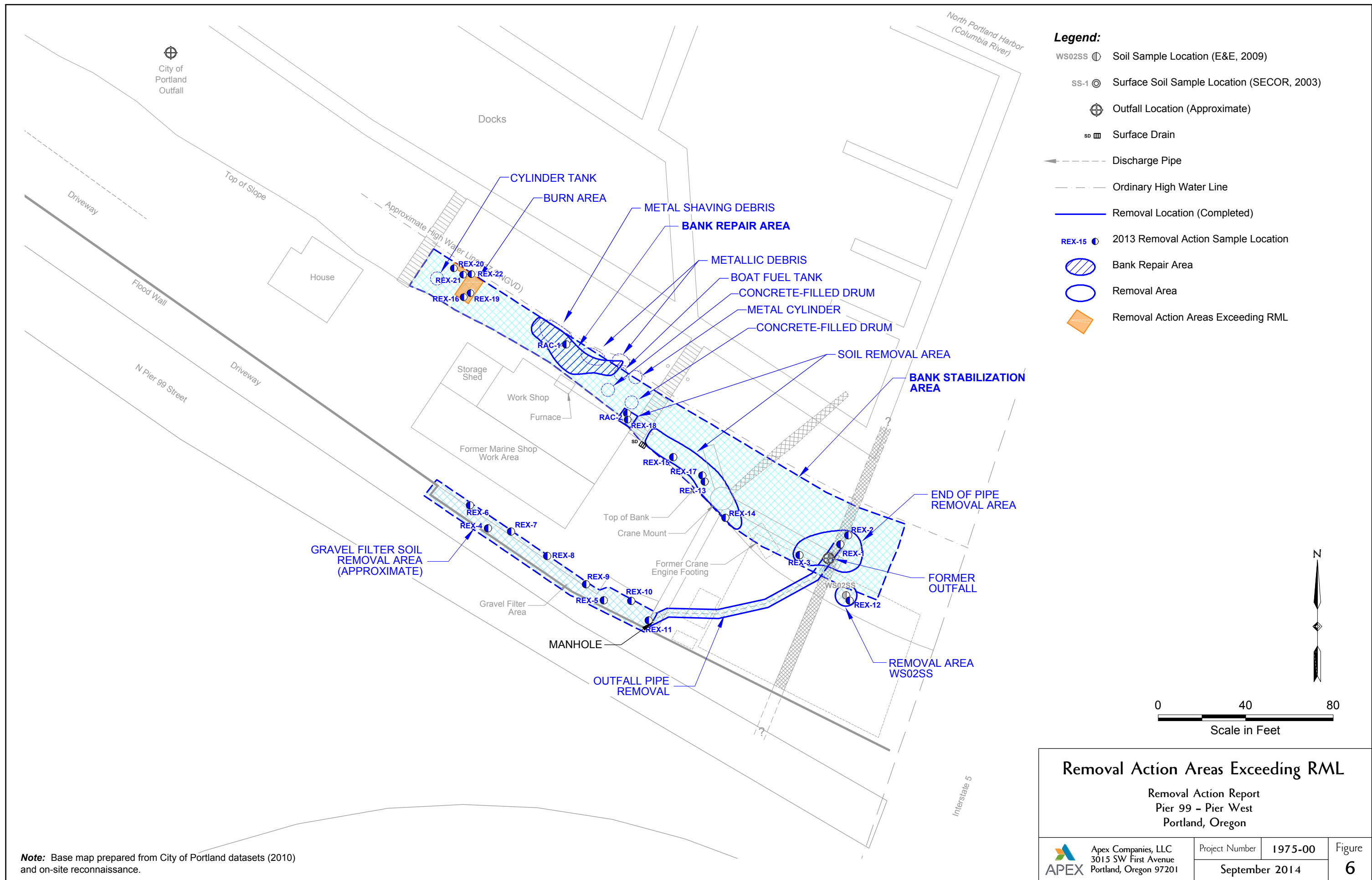
REX-2	1-1.5'
9/19/2013	
DDE	<4.21
DDD	15.1
DDT	4.51
B(a)P	46.2
PCB	18

OP01SS	0-6"
10/30/2008	
DDE	0.74
DDD	0.28
DDT	<4.3
B(a)P	<43
PCB	<12

SS-14	0.5'
2/21/2013	
DDE	<1.0
DDD	<1.0
DDT	<1.6
B(a)P	100
PCB	11

WS01SS	0-6"
10/30/2008	
DDE	--
DDD	76
DDT	33
B(a)P	--
PCB	130

BK01SS	0-6"
10/30/2008	
As	<3.4
Cu	0.39
Pb	1.2
Hg	--
TBT	<34

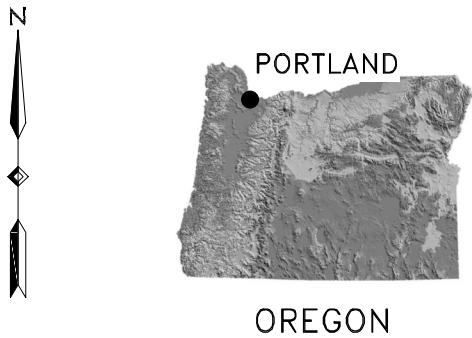
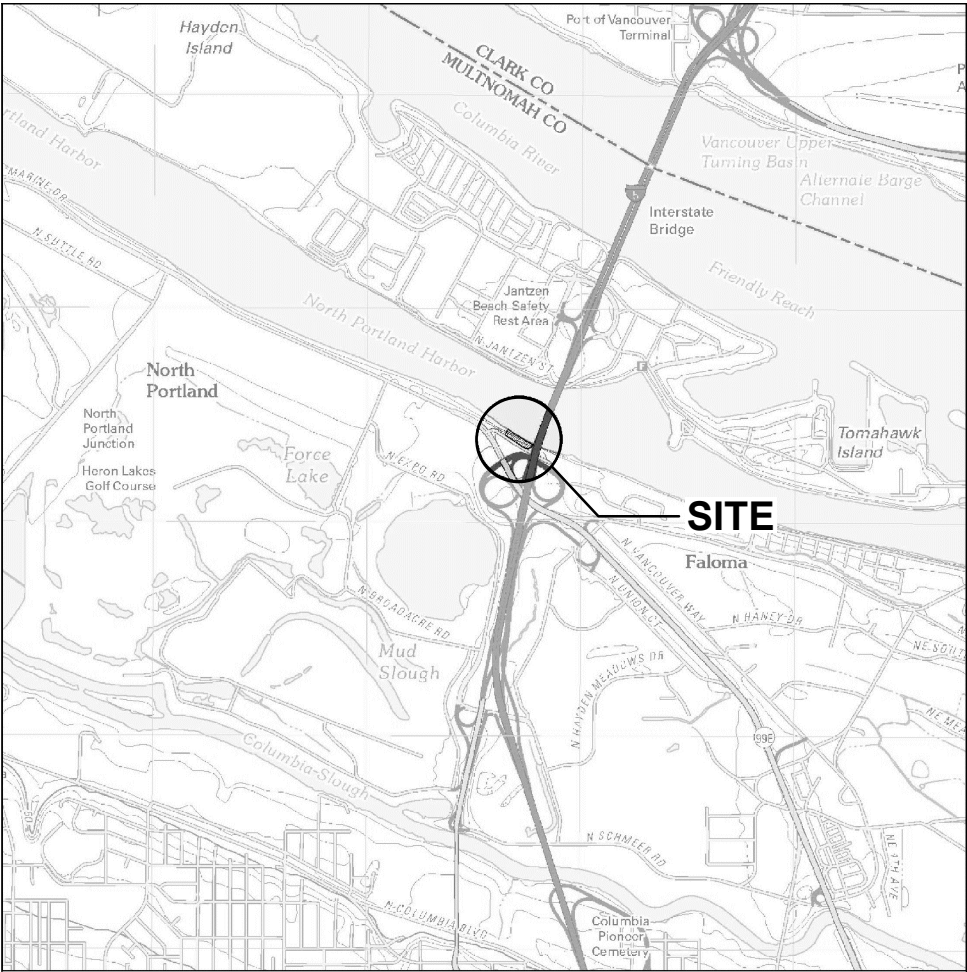


**Note:** Base map prepared from City of Portland datasets (2010) and on-site reconnaissance.

## ***Appendix A***

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### **Project Drawings and Specifications and Compaction Testing Results**



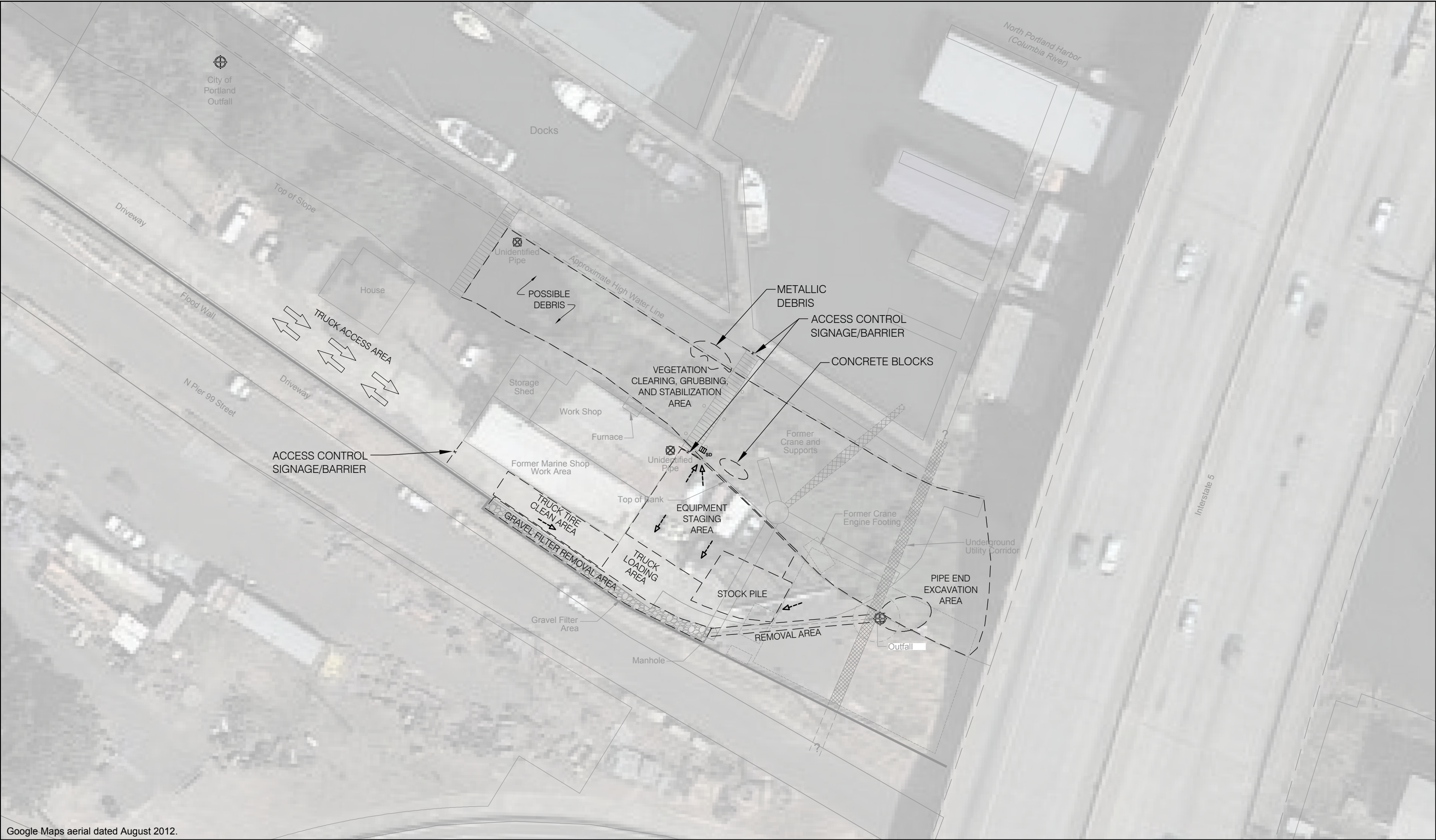
DRAWING SET:

- A-1 SITE PLAN
- A-2 EROSION CONTROL AND GRADING PLAN
- A-3 SITE RESTORATION PLAN
- A-4 EROSION CONTROL AND GRADING DETAILS
- A-5 SPECIFICATIONS


LEGEND:

- OUTFALL LOCATION (APPROXIMATE)
- UNIDENTIFIED PIPE LOCATION
- SURFACE DRAIN
- DISCHARGE PIPE
- SEDIMENT FENCE
- BARRIER
- EXISTING SURFACE FLOW DIRECTION
- FINAL SURFACE FLOW DIRECTION

SOURCES:  
1. USGS 7.5-MINUTE QUADRANGLE OF PORTLAND, OR, DATED 2011 AS PROVIDED BY USGS.GOV.  
2. BASE MAP PREPARED FROM CITY OF PORTLAND DATASETS (2010) AND ON-SITE RECONNAISSANCE.



Google Maps aerial dated August 2012.



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SUBMITTED: HERB CLOUGH  
PRINCIPAL ENGINEER

DATE: 8/2/13

EXTERNAL  
REFERENCE FILES

DESIGNED: IRM/JPF  
DRAWN: JLP  
CHECKED: HFC  
APPROVED: HFC

ZONE		REV.	REVISIONS DESCRIPTION	BY	DATE	APP.

SITE PLAN

REMOVAL ACTION WORK PLAN

PIER 99 - PIER WEST

PORTLAND, OREGON

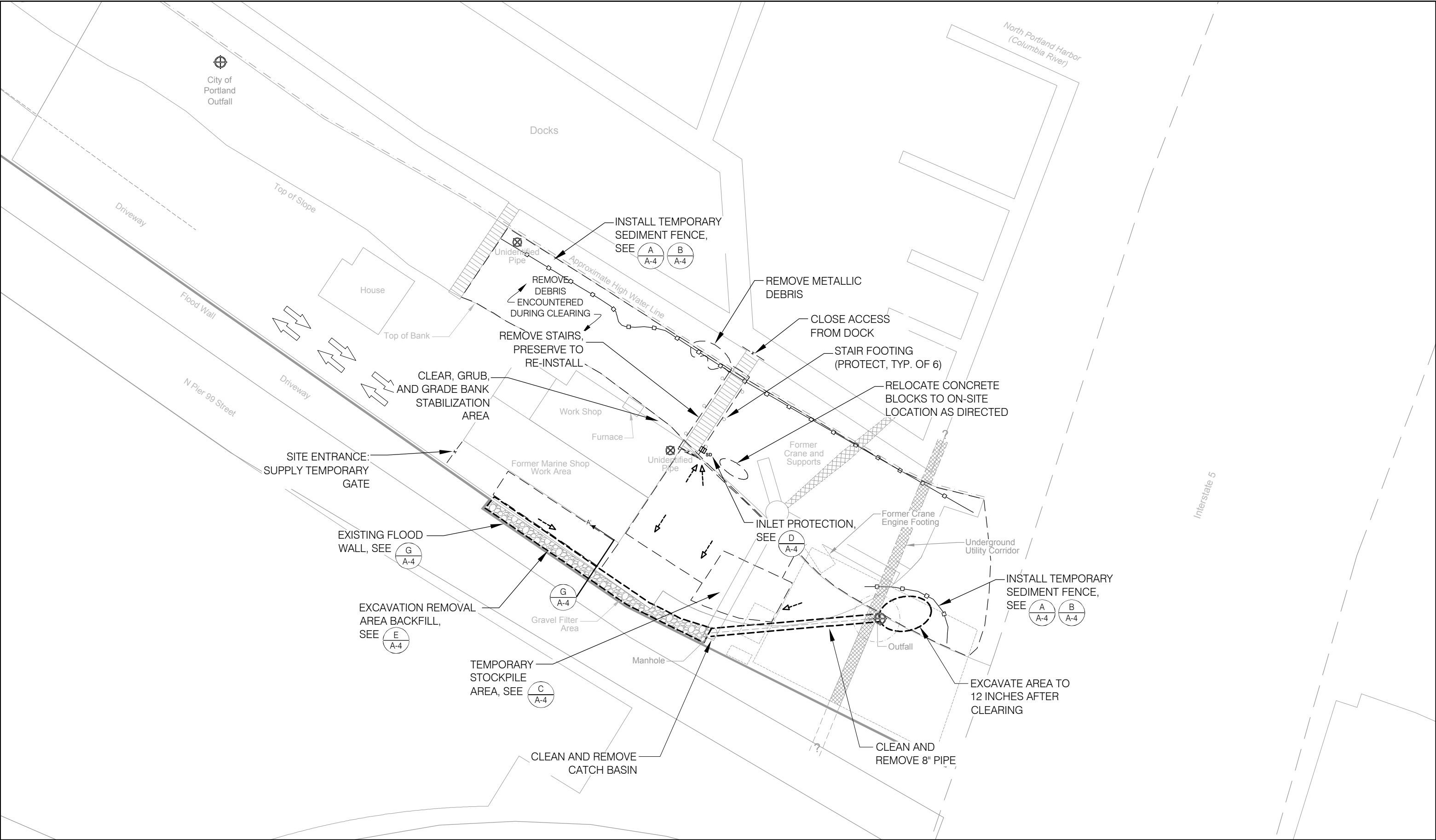
FILENAME  
SITE PLAN


AC PROJECT NUMBER  
1975-00

SCALE  
1" = 40'

DRAWING NUMBER  
A-1

SHEET NUMBER  
2 OF 6





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APPROVED: HFC

EXTERNAL  
REFERENCE FILES


ZONE	REV.	REVISIONS DESCRIPTION	BY	DATE	APP.

EROSION CONTROL AND  
GRADING PLAN

REMOVAL ACTION WORK PLAN  
PIER 99 - PIER WEST  
PORTLAND, OREGON

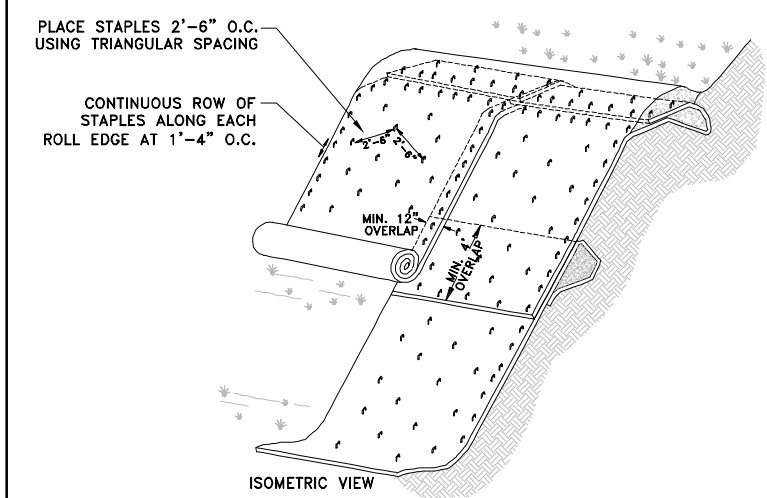
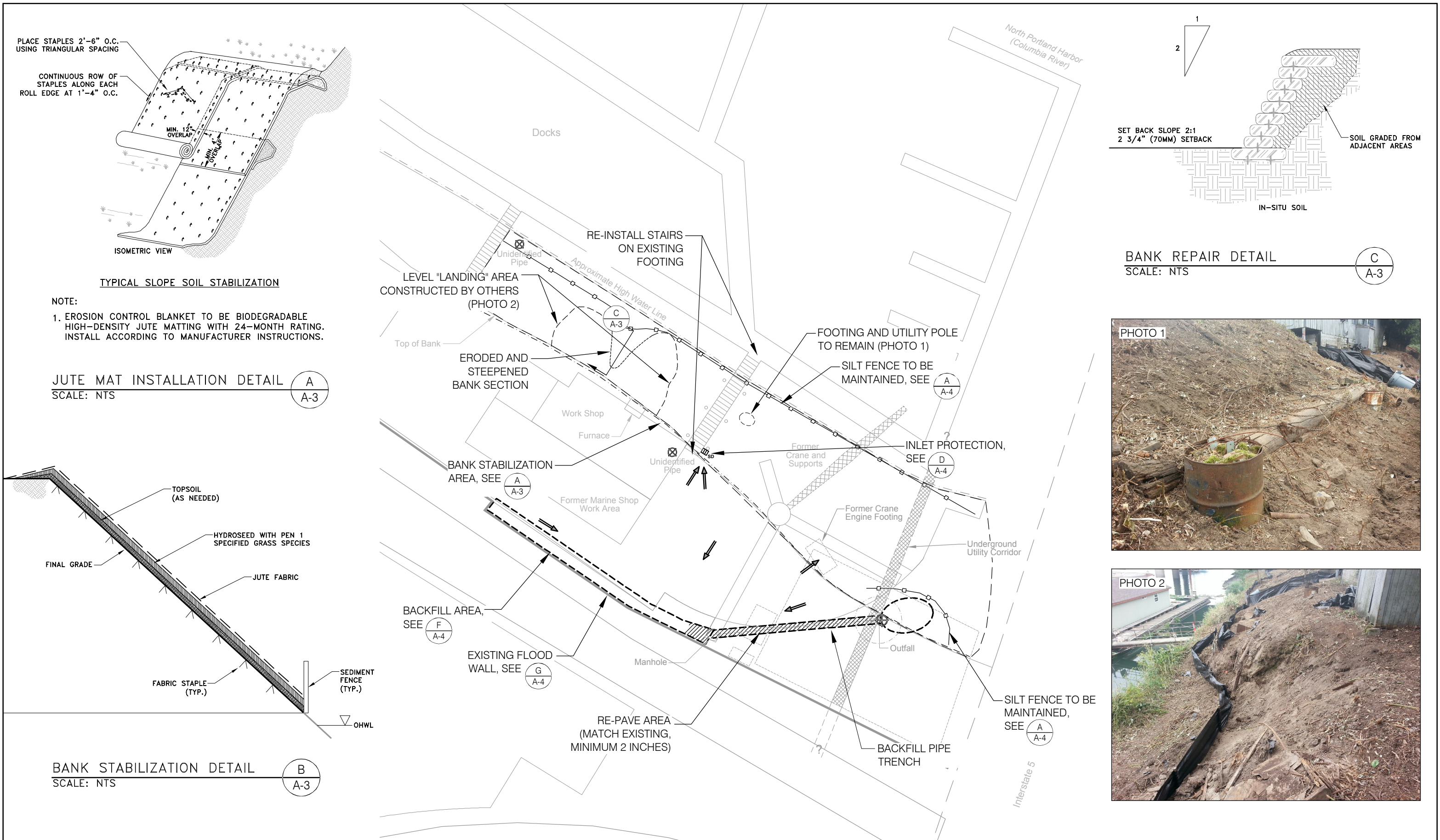
FILENAME  
SITE PLAN

AC PROJECT NUMBER  
1975-00

SCALE  
1" = 40'

DRAWING NUMBER  
A-2

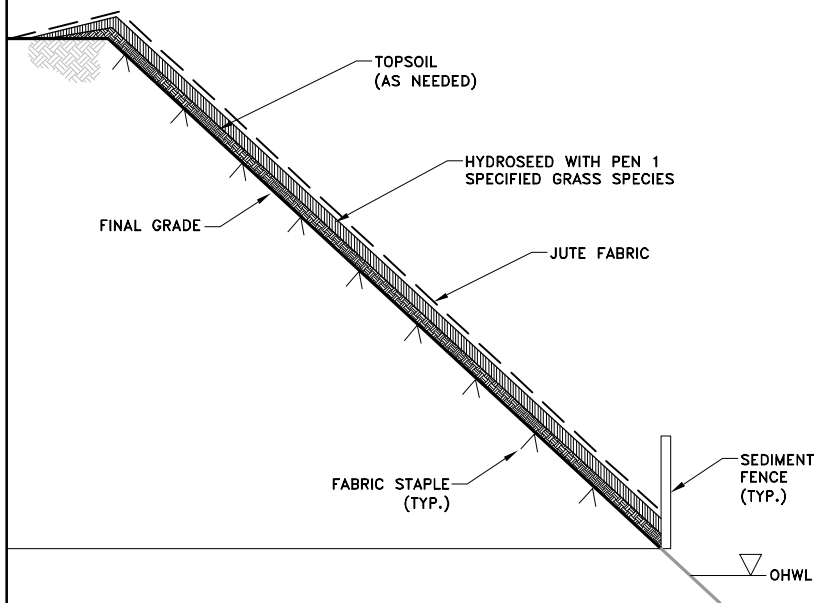
SHEET NUMBER  
3 OF 6



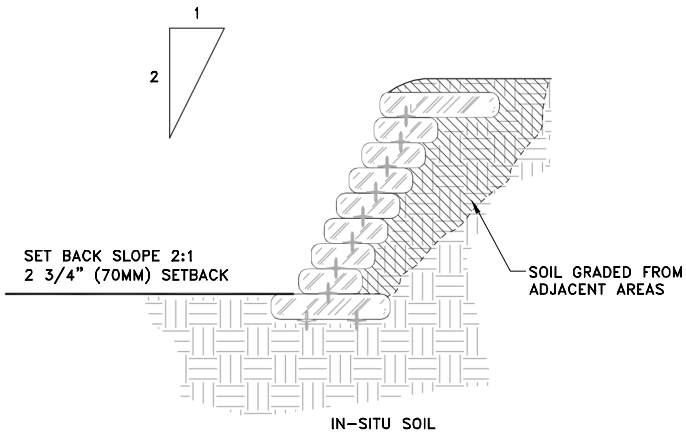
TYPICAL SLOPE SOIL STABILIZATION

NOTE:  
1. EROSION CONTROL BLANKET TO BE BIODEGRADABLE HIGH-DENSITY JUTE MATTING WITH 24-MONTH RATING. INSTALL ACCORDING TO MANUFACTURER INSTRUCTIONS.

JUTE MAT INSTALLATION DETAIL  
SCALE: NTS

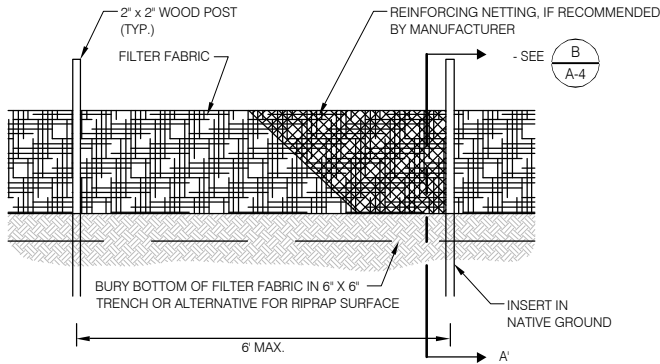


BANK STABILIZATION DETAIL  
SCALE: NTS



BANK REPAIR DETAIL  
SCALE: NTS

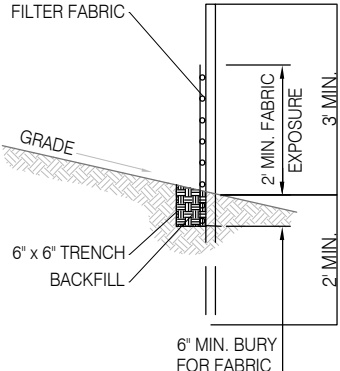




- NOTES:
1. INSTALL IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
  2. FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS 36 IN. WIDE (MIN.) ROLL TO AVOID JOINTS. ATTACH TO STAKES USING STITCHED LOOPS.
  3. SPLICE JOINTS AT SUPPORT POSTS ONLY, WITH A MIN. 6 IN. OVERLAP.
  4. ANGLE ENDS OF SEDIMENT FENCE UPHILL TO ASSURE SOIL/SEDIMENT IS TRAPPED.

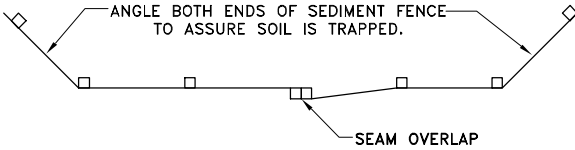
SEDIMENT FENCE DETAIL  
- ELEVATION  
SCALE: NTS

A  
A-4



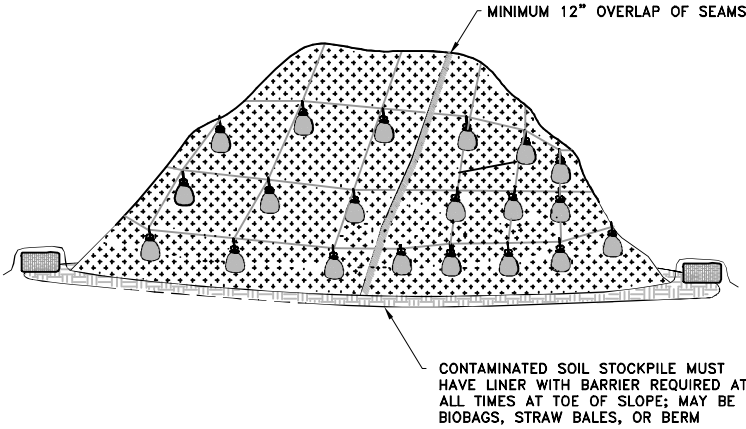
SECTION A-A'

TOP VIEW



CROSS-SECTION A-A'  
SCALE: NTS

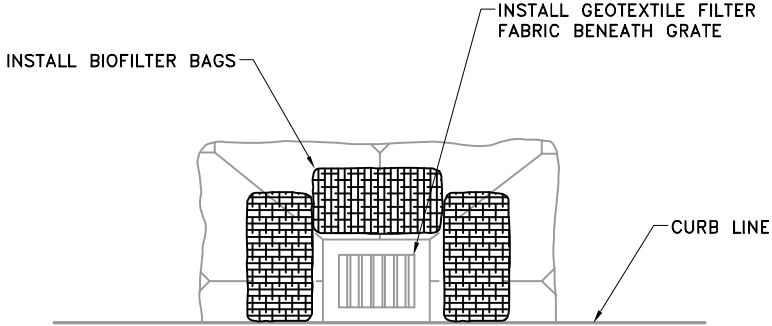
B  
A-4



- NOTES:
1. COVER STOCKPILE DAILY.
  2. MINIMUM 12" OVERLAP OF ALL SEAMS REQUIRED.
  3. BARRIER REQUIRED AT TOE OF STOCK PILE.
  4. COVERING MAINTAINED TIGHTLY IN PLACE BY USING WEIGHTS (e.g. SANDBAGS) ON ROPES WITH A MAXIMUM 10' GRID SPACING IN ALL DIRECTIONS.

STOCKPILE DETAIL  
SCALE: NTS

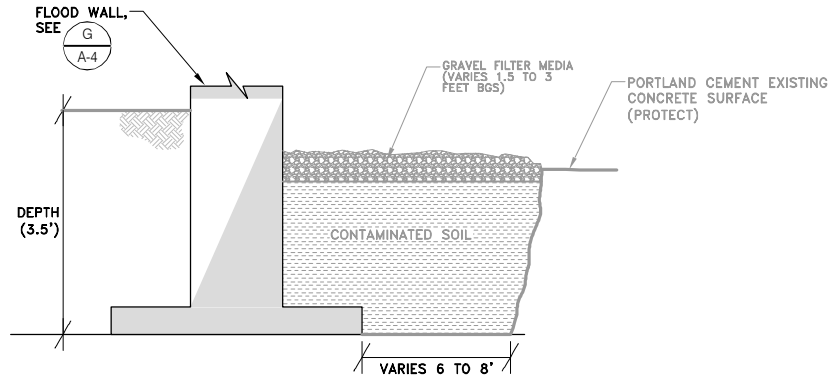
C  
A-4



- NOTE:
1. BIOFILTER BAGS SHOULD BE STAKED WHERE APPLICABLE USING (2) 1" x 2" WOODEN STAKES OR APPROVED EQUAL PER BAG.

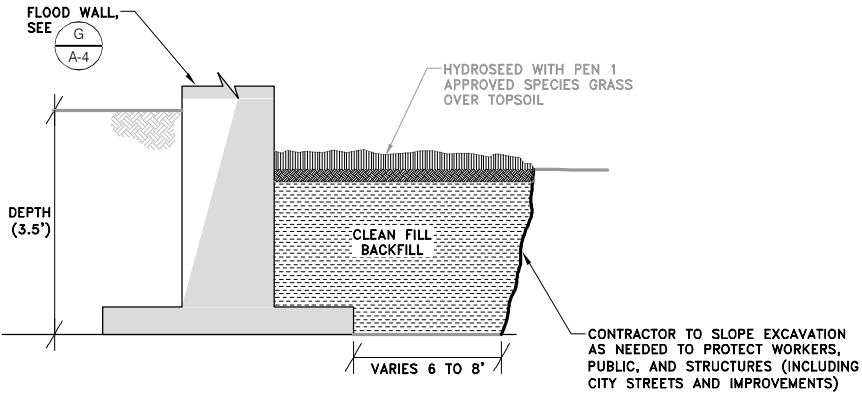
TEMPORARY INLET PROTECTION  
SCALE: NTS

D  
A-4



EXCAVATION SECTION  
SCALE: NTS

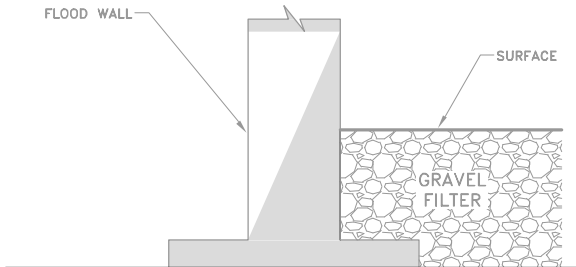
E  
A-4



- NOTES:
1. BACKFILL ONLY AFTER APPROVAL OF CONFIRMATION SAMPLES BY ENGINEER

BACKFILL SECTION  
SCALE: NTS

F  
A-4



FLOOD WALL DETAIL  
SCALE: NTS

G  
A-4



3015 SW FIRST AVENUE  
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www.ashcreekassociates.com

DESIGNED: JRM/JPF  
DRAWN: JLP  
CHECKED: HFC  
APPROVED: HFC

EXTERNAL REFERENCE FILES	

REVISIONS				
ZONE	REV.	DESCRIPTION	BY	DATE

EROSION CONTROL AND  
GRADING DETAILS  
REMOVAL ACTION WORK PLAN  
PIER 99 - PIER WEST  
PORTLAND, OREGON

FILENAME SITE PLAN
AC PROJECT NUMBER 1975-00
SCALE NTS
DRAWING NUMBER A-4
SHEET NUMBER 5 OF 6

SUBMITTED: HERB CLOUGH  
PRINCIPAL ENGINEER

DATE: 8/2/13

GENERAL:

- OWNER TO STAKE OHWL AND ALL EXCAVATION AREAS.
- THE WORK TO BE PERFORMED SHALL CONSIST OF FURNISHING ALL TOOLS, EQUIPMENT, MATERIALS, SUPPLIES, TRANSPORTATION AND SERVICES (INCLUDING FUEL, POWER, WATER AND ESSENTIAL COMMUNICATIONS), AND FOR THE PERFORMANCE OF ALL LABOR OR OTHER OPERATIONS REQUIRED IN STRICT ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS. THE WORK SHALL BE COMPLETED, AND ALL WORK, MATERIALS, AND SERVICES NOT EXPRESSLY SHOWN OR CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS WHICH MAY BE NECESSARY FOR THE COMPLETE AND PROPER CONSTRUCTION OF THE WORK IN GOOD FAITH SHALL BE PERFORMED, FURNISHED, AND INSTALLED BY CONTRACTOR AS THOUGH ORIGINALLY SO SPECIFIED OR SHOWN.
- CONTRACTOR WILL LOCATE ALL UNDERGROUND UTILITIES PRIOR TO ANY ON-SITE ACTIVITIES.
- WORK BEING COMPLETED UNDER EPA PERMIT EXEMPTION, CONTRACTOR IS NOT RESPONSIBLE FOR OBTAINING GRADING PERMITS.
- CONTRACTOR SHALL COMPLETE ALL WORK IN ACCORDANCE WITH A SITE-SPECIFIC HEALTH AND SAFETY PLAN (HASP) TO BE PREPARED BY CONTRACTOR. THE PLAN SHALL BE PREPARED IN ACCORDANCE WITH OSHA 1910.120.
- ANY EQUIPMENT USED BY THE CONTRACTOR SHALL BE INSPECTED PRIOR TO TRANSPORT TO THE SITE AND ON A DAILY BASIS ONCE ON THE SITE. ITEMS TO BE INSPECTED INCLUDE BUT ARE NOT LIMITED TO ALL HYDRAULIC HOSES AND FITTINGS. A SPILL KIT WILL BE KEPT ON SITE TO BE USED IN THE EVENT OF A FUEL OR HYDRAULIC FLUID RELEASE

EXCAVATION AND BACKFILL:

- EXCAVATION AREAS TO BE STAKED BY ENGINEER. TARGET GRAVEL FILTER EXCAVATION DEPTH IS 3.5 FEET AND END OF PIPE AREA IS 1 FOOT.
- EXCAVATED SOIL IS CONTAMINATED SOIL.
- BACKFILL USING CLEAN SAND MEETING REQUIREMENTS OF ODOT GENERAL BACKFILL (00330.13). PLACE FILL IN 1-FOOT LIFTS AND COMPACT TO 95% DRY DENSITY PER AASHTO T-99 METHOD.
- CONTRACTOR SHALL COMPLETE COMPACTION TESTING AND PROVIDE ENGINEER WITH COMPACTION REPORTS.
- ALL LOADS MUST BE COVERED PRIOR TO LEAVING SITE. CLEAN TRUCK TIRES AS NEEDED TO REMOVE SOIL.
- CONTAMINATED SOIL SHALL BE DISPOSED OF AT A FACILITY PERMITTED TO HANDLE THE RESPECTIVE WASTE TYPES.

FLOOD WALL:

- CONTRACTOR MAY ENCOUNTER CONCRETE FOOTING FOR THE COLUMBIA FLOOD WALL DURING EXCAVATION. THE FOOTING SHALL NOT BE REMOVED OR DAMAGED DURING THE EXCAVATION ACTIVITIES. IF DAMAGE OCCURS, CONTRACTOR SHALL REPAIR TO THE SATISFACTION OF PEN 1.
- EXCAVATION SHALL NOT UNDERMINE FLOOD WALL FOOTING. CONTRACTOR SHALL DETERMINE IF ADDITIONAL MEASURES ARE NECESSARY.

PIPE CLEANING AND REMOVAL:

- CONTRACTOR SHALL BE RESPONSIBLE FOR COLLECTING SEDIMENT AND WATER REMOVED DURING PIPE FLUSHING AND CLEANING. CONTRACTOR SHALL ENSURE THAT NEITHER SEDIMENT NOR WATER ENTERS RIVER.
- THE PIPE WILL BE EXCAVATED BY REMOVAL FOR DISPOSAL AS CONSTRUCTION WASTE. BACKFILL AS DESCRIBED IN 'EXCAVATION AND BACKFILL', NOTES 3 AND 4. ASPHALT TO BE SAWCUT TO ACCESS PIPE AND REPLACED AFTER BACKFILL.
- CONTAMINATED WASTES SHALL BE DISPOSED OF AT A FACILITY PERMITTED TO HANDLE THE RESPECTIVE WASTE TYPES.

BANK CLEARING:

- CONTRACTOR WILL INSTALL SILT FENCE ALONG THE ENTIRE BANK WORK AREA AND SHALL BE LOCATED ABOVE OHWL PRIOR TO COMMENCING VEGETATIVE CLEARING.
- SILT FENCE WILL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS 36 IN. WIDE (MIN.) ROLL TO MINIMIZE JOINTS. SILT FENCE SHOULD BE ATTACHED TO STAKES USING STITCHED JOINTS. SPLICE JOINTS AT SUPPORT POSTS ONLY, WITH A MIN. 6 IN. OVERLAP. ANGLE ENDS OF SEDIMENT FENCE UPHILL TO ASSURE SOIL/SEDIMENT IS TRAPPED.
- CONTRACTOR TO REMOVE, PROTECT, AND RE-INSATALL STAIR SECTION SHOWN ON A-3
- THE BANK WILL BE CLEARED USING CLOSE CUTTING TECHNIQUES TO REMOVE VEGETATION (E.G. BLACKBERRIES). CONTRACTOR WILL MINIMIZE SOIL DISTURBANCE DURING CLEARING.
- ONCE CLEARING IS COMPLETE, THE BANK SLOPE WILL BE INSPECTED BY ENGINEER TO DETERMINE THE EXTENT OF REQUIRED GRADING ACTIVITIES.
- CONTRACTOR TO GRUB ENTIRE STABILIZATION AREA AND REMOVE DEBRIS AS DIRECTED BY ENGINEER, PRIOR TO GRADING.

BANK GRADING AND STABILIZATION:

- GRADING ACTIVITY IS LIMITED TO BANK AREA SHOWN ON A-3 ABOVE OHWL, DENOTED AS ELEVATION 17.6-FT (NGVD) AT RIVER MILE106.
- GRADING ACTIVITY IS EXPECTED TO RESULT IN NO NET GAIN OR LOSS OF BANK MATERIAL. BANK MATERIAL MAY BE RELOCATED ALONG THE BANK TO REMOVE HIGH OR LOW SPOTS IN ORDER TO CREATE A CONSISTENT BANK SLOPE.

RESTORATION:

- AFTER FINAL GRADING, PLACE A MINIMUM OF 2-INCHES OF TOP SOIL ACROSS THE ENTIRE CLEARED BANK.
- REVEGETATION BY HYDROSEEDING WILL BE COMPLETED ONCE CONSTRUCTION ACTIVITIES ARE COMPLETE. HYDROSEED CLEARED AREA OF BANK AT THE APPLICATION RATE OF 150 TO 200 POUNDS PER ACRE. SEED MIX SHALL CONSIST OF 25% HARD FESCUE, 25% BLUE FESCUE, 25% CREEPING RED FESCUE, AND 25% CHEWINGS FESCUE. FOR SEEDING AFTER SEPTEMBER 15, ANNUAL RYEGRASS SEED SHALL BE ADDED TO MIX AT A RATE OF 100 POUNDS PER ACRE.

RESTORATION (CONTINUED):

- BANK SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS, DEBRIS, AND GRASS PRIOR TO APPLICATION. FABRIC SHALL HAVE GOOD SOIL CONTACT.
- APPLY PERMANENT HYDROSEEDING BEFORE PLACING EROSION CONTROL BLANKET (ECB).
- CONTRACTOR SHALL INSTALL ECB (HIGH-DENSITY BIODEGRADABLE JUTE MATTING WITH MINIMUM 24-MONTH RATING) ALONG THE BANK. INSTALLATION SHOULD CONFORM TO MANUFACTURE'S SPECIFICATIONS AND MEET CITY OF PORTLAND EROSION CONTROL MANUAL SPECIFICATIONS.
- LAY ECB LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.
- ECB SHOULD BE INSTALLED VERTICALLY DOWNSLOPE.
- INSTALL ECB BETWEEN THE TOP OF BANK AND ABOVE OHWL.
- CONTRACTOR SHALL NOT USE NITROGEN OR PHOSPHOROUS CONTAINING FERTILIZERS. COMPOST OR WEED FREE MULCH MAY BE USED IF NECESSARY.

HEALTH AND SAFETY:

- THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL MATTERS RELATING TO THE HEALTH AND SAFETY OF ITS PERSONNEL AND EQUIPMENT IN PERFORMANCE OF THE WORK. THIS INCLUDES RECOGNITION OF THE POTENTIAL HEALTH AND SAFETY HAZARDS ASSOCIATED WITH THE WORK, AND COMPLIANCE WITH THE MINIMUM REQUIREMENTS OF THE HEALTH AND SAFETY PLAN IN FORCE FOR THE WORK. THE CONTRACTOR HAS THE OPTION TO EXERCISE MORE CONSERVATIVE HEALTH AND SAFETY PRACTICES, PROVIDED A MINIMUM OF ONE-DAY NOTICE IS GIVEN TO APEX. THE SITE CONTAMINANTS OF CONCERN ARE PETROLEUM HYDROCARBONS AND ITS CONSTITUENTS.
- THE CONTRACTOR WILL WARRANT THAT ALL ITS EMPLOYEES THAT ARE PERMITTED TO ENGAGE IN HAZARDOUS WASTE OPERATIONS WHICH COULD EXPOSE THEM TO HAZARDOUS SUBSTANCES, SAFETY, OR HEALTH HAZARDS, HAVE OBTAINED THE NECESSARY HEALTH AND SAFETY TRAINING AND MEDICAL MONITORING AS SPECIFIED IN 29 CFR 1910.120, HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE, AND ALL APPLICABLE STATE AND LOCAL LAWS, REGULATIONS, AND ORDINANCES REGARDING HEALTH AND SAFETY.

INADVERTENT DISCOVERY:

IN THE EVENT OF AN INADVERTENT DISCOVERY OF POSSIBLE ARCHAEOLOGICAL MATERIALS, THE PROJECT LEAD SHALL ADHERE TO THE FOLLOWING PROTOCOL:

- (A) ALL WORK WILL STOP IMMEDIATELY IN THE VICINITY OF THE FIND;
- (B) THE AREA WILL BE SECURED AND PROTECTED WITHIN A 50 FOOT BUFFER;
- (C) THE PROJECT LEAD SHALL MAKE NOTIFICATIONS TO THE FOLLOWING REPRESENTATIVES:


Agency	Personnel	Contact Information
Oregon SHPO, State Archaeologist	Dennis Griffin	503-986-0674
Archaeological Investigations NW (Professional Archaeologist)	John L. Fagan, Ph.D., R.P.A.	503-761-6605

(D) IF POSSIBLE HUMAN REMAINS ARE ENCOUNTERED, THE OREGON STATE POLICE, COMMISSION ON INDIAN SERVICES (CIS), WILL ALSO BE NOTIFIED.

OREGON STATE POLICE: CHRIS ALLORI 503-731-4717 CIS: KAREN QUIGLEY 503- 986-1067

NO WORK AT THE DISCOVERY LOCATION MAY RESUME UNTIL SHPO AND/OR TRIBAL ARCHAEOLOGY PERSONNEL HAVE ASSESSED THE SITUATION AND ARE IN AGREEMENT WITH THE MITIGATION PLAN (IF REQUIRED). THE DISCOVERY SITE WILL BE SECURED AND PROTECTED UNTIL THE PROJECT RESUMES.

IF HUMAN REMAINS ARE ENCOUNTERED, DO NOT DISTURB THEM IN ANY WAY. *DO NOT CALL 911* . DO NOT SPEAK WITH THE MEDIA. SECURE THE LOCATION. DO NOT TAKE PHOTOS. THE OREGON SHPO, OREGON STATE POLICE, AND OREGON'S LEGISLATIVE CIS, AND APPROPRIATE TRIBAL GOVERNMENTS WILL DETERMINE AN APPROPRIATE COURSE OF ACTION. ADDITIONAL ARCHAEOLOGICAL EXCAVATIONS MAY BE REQUIRED, AND WOULD BE HANDLED IN COORDINATION WITH THE PARTIES PREVIOUSLY LISTED.



Apex Companies, LLC

SUBMITTED: HERB CLOUGH  
PRINCIPAL ENGINEER

DATE: 8/2/13

3015 SW FIRST AVENUE  
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www.ashcreekassociates.com

DESIGNED: IRM/JPL  
DRAWN: JLP  
CHECKED: HFC  
APPROVED: HFC

EXTERNAL  
REFERENCE FILES

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

SPECIFICATIONS

REMOVAL ACTION WORK PLAN  
PIER 99 - PIER WEST  
PORTLAND, OREGON

FILENAME  
SITE PLAN

AC PROJECT NUMBER  
1975-00

SCALE  
NTS

DRAWING NUMBER  
A-5

SHEET NUMBER  
6 OF 6

# Carlson Testing, Inc.

Bend Office (541) 330-9155  
 Geotechnical Office (503) 601-8250  
 Eugene Office (541) 345-0289  
 Salem Office (503) 589-1252  
 Tigard Office (503) 684-3460

## Report Of In-Place Density Tests

Date: 10/16/2013

Job Number: T1309392.

Permit #: N/A

Client: TERRA HYDR INC - TRISTY KOTZIAN

Project: PIER 99 - COMPACTION

Address: 1601 N PIER 99 ST PORTLAND OR

Material Description: GRAY IMPORTED SAND, (SP) CAL PORTLAND

Maximum Dry Density: 92 lbs./cu. ft. Optimum Moisture: 14 % Required Compaction: 95 %

Standard Count for Gauge Serial# Troxler 26149

Method of Test: ASTM D6938/ AASHTO T-99

Source of Value Dated 10/03/2013 is project specific.

Standard Counts - Density: 2429

Moisture: 666

Calibration Data: 02/2013

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.)		% Comp.
										Wet	Dry	
10-03	1	DT	50' EAST OF WEST END OF TRENCH	3660	97	DT	6"	FSG	7.2	96.4	89.6	98
10-03	2	DT	100' EAST OF WEST END OF TRENCH	3474	87	DT	6"	FSG	6.1	98.4	92.8	101
10-03	3	DT	AT PAVEMENT CROSSING, EAST END OF TRENCH	3186	127	DT	6"	FSG	9.4	102.1	93.3	101

☐ Distribute attachments.

Please see reverse side for additional information.

Job Number: T1309392.

Date Of Test: 10/03/2013

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.)		% Comp.
										Wet	Dry	

Asterisked (\*) percent compaction test results did not meet listed acceptance criteria.

#### Remarks:

FSG = FINISHED SUBGRADE

CC: TERRA HYDR INC - TRISTY KOTZIAN

CORPORATE@TERRAHYDR.COM

Test By: L. WARFIELD

Reviewed By: Project Manager On 10/17/2013

Project Manager: Greg Leeper

Test results were discussed and left with KK  
of TERRA HYDR

#### Code Descriptions

NC - No code (general fill areas and backfill/original ground/not fill)  
SF - Structural fill (Buildings Non-Residential)  
LF - Residential lot engineered fill  
RF - Roadway engineered fill (Soil Only)  
PS - Pavement subgrade

BC - Base course (Rock Only)  
RW - Retaining wall backfill  
WT - Water line trench  
ST - Sanitary sewer trench  
DT - Storm drain trench

ET - Electrical trench  
GT - Gas line trench  
CT - Cable, phone trenches

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8430 SW HUNZIKER ST, TIGARD OR - PO BOX 23814, TIGARD OR 97281

## ***Appendix B***



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### **Photograph Log**

## APPENDIX B PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 1	
<b>Photo Date:</b> 9/24/2013	
<b>Orientation:</b> NA	
<b>Description:</b>  Stormwater inlet in northwest corner of site.	
<b>Photo No:</b> 2	
<b>Photo Date:</b> 9/24/2013	
<b>Orientation:</b> Northeast	
<b>Description:</b>  Biofilter bags (in green) placed across stormwater inlet.	

## APPENDIX B PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01



**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<p><b>Photo No:</b> 3</p>	
<p><b>Photo Date:</b> 9/24/2013</p>	
<p><b>Orientation:</b> East</p>	
<p><b>Description:</b></p> <p>East section bank area with silt fence in background.</p>	
<p><b>Photo No:</b> 4</p>	
<p><b>Photo Date:</b> 9/24/2013</p>	
<p><b>Orientation:</b> West</p>	
<p><b>Description:</b></p> <p>West section bank area with silt fence in background.</p>	

## APPENDIX B PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 5	
<b>Photo Date:</b> 9/24/2013	
<b>Orientation:</b> North	
<b>Description:</b>  Vegetation clearing.	
<b>Photo No:</b> 6	
<b>Photo Date:</b> 9/24/2013	
<b>Orientation:</b> East	
<b>Description:</b>  Vegetation clearing.	

## APPENDIX B PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01



**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 7	
<b>Photo Date:</b> 9/24/2013	
<b>Orientation:</b> East	
<b>Description:</b>  Gravel Filter Area excavation. Two section of perforated drain pipe are visible draining the filter to the manhole in the background.	
<b>Photo No:</b> 8	
<b>Photo Date:</b> 9/24/2013	
<b>Orientation:</b> East	
<b>Description:</b>  Gravel Filter Area excavation. The floodwall footing is visible on the right sidewall of the excavation area.	

## APPENDIX B PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01



**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 9	
<b>Photo Date:</b> 9/18/2013	
<b>Orientation:</b> East	
<b>Description:</b>  Excavation area around the distal end of the discharge piping.	
<b>Photo No:</b> 10	
<b>Photo Date:</b> 9/18/2013	
<b>Orientation:</b> East	
<b>Description:</b>  Excavation and removal of the discharge piping. The distal end of the pipe is visible on the left.	

## APPENDIX B PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 11	
<b>Photo Date:</b> 9/20/2013	
<b>Orientation:</b> Northeast	
<b>Description:</b>  Backfilling and compaction of the discharge pipe trench following removal, looking from the eastern extent of the gravel filter area.	
<b>Photo No:</b> 12	
<b>Photo Date:</b> 9/26/2013	
<b>Orientation:</b> Northeast	
<b>Description:</b>  Excavation area around historical sample location WS02SS. The leave surface sample location is visible near the center of the area.	

## APPENDIX B PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 13	
<b>Photo Date:</b> 9/13/2013	
<b>Orientation:</b> West	
<b>Description:</b>  Westernmost portion of bank area. Burn debris box is located in background and pressure vessel is located in the foreground.	
<b>Photo No:</b> 14	
<b>Photo Date:</b> 9/13/2013	
<b>Orientation:</b> West	
<b>Description:</b>  Removal of the cylindrical pressure vessel from the west side of the bank stabilization area.	

## APPENDIX B PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 15	
<b>Photo Date:</b> 9/13/2013	
<b>Orientation:</b> NA	
<b>Description:</b>  Emptying the burn area container prior to removal.	
<b>Photo No:</b> 16	
<b>Photo Date:</b> 9/13/2013	
<b>Orientation:</b> NA	
<b>Description:</b>  Emptying the burn area container prior to removal.	

## APPENDIX B PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01


**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 17	
<b>Photo Date:</b> 9/13/2013	
<b>Orientation:</b> NA	
<b>Description:</b>  Burn area following metal removal.	
<b>Photo No:</b> 18	
<b>Photo Date:</b> 9/13/2013	
<b>Orientation:</b> NA	
<b>Description:</b>  Additional excavation following removal of metal "rings" in bottom of burn box.	

## APPENDIX B PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 19	
<b>Photo Date:</b> 9/13/2013	
<b>Orientation:</b> NA	
<b>Description:</b>  Final excavation surface after visible burn debris was removed.	
<b>Photo No:</b> 20	
<b>Photo Date:</b> 6/30/14	
<b>Orientation:</b> Northeast	
<b>Description:</b>  Initial slope excavation at burn area.	

## APPENDIX B PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01



**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 21	
<b>Photo Date:</b> 6/30/14	
<b>Orientation:</b> North	
<b>Description:</b>  Excavation at transition between slope and toe of bank area. Note mattress springs in background.	
<b>Photo No:</b> 22	
<b>Photo Date:</b> 7/2/14	
<b>Orientation:</b> East	
<b>Description:</b>  Exposed cut along bank at toe of slope.	

## APPENDIX B PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01



**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 23	
<b>Photo Date:</b> 7/2/14	
<b>Orientation:</b> East	
<b>Description:</b>  Envirolok installation and backfill.	
<b>Photo No:</b> 24	
<b>Photo Date:</b> 7/2/14	
<b>Orientation:</b> West	
<b>Description:</b>  Envirolok installation and backfill.	

## APPENDIX B PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01



**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 25	
<b>Photo Date:</b> 7/2/14	
<b>Orientation:</b> East	
<b>Description:</b>  Backfill on slope of bank.	
<b>Photo No:</b> 26	
<b>Photo Date:</b> 7/2/14	
<b>Orientation:</b> West	
<b>Description:</b>  Jute fabric installation at burn area.	

## APPENDIX B PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01



**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 27	
<b>Photo Date:</b> 10/1/2013	
<b>Orientation:</b> West	
<b>Description:</b>  Metal cuttings encountered at the western end of the bank repair area.	
<b>Photo No:</b> 28	
<b>Photo Date:</b> 9/26/2013	
<b>Orientation:</b> Northwest	
<b>Description:</b>  Metal debris removed from the bank repair area.	

## APPENDIX B PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 29	
<b>Photo Date:</b> 9/10/2013	
<b>Orientation:</b> Southeast	
<b>Description:</b>  Five stacked concrete counterweights were removed from the bank during clearing. The blocks were later incorporated onsite to stabilize the parking area retaining structure at the top of the bank.	
<b>Photo No:</b> 30	
<b>Photo Date:</b> 10/1/2013	
<b>Orientation:</b> West	
<b>Description:</b>  Removal of the thin concrete cap adjacent to the eastern staircase. Soil with sandblasting residuals was discovered underneath and removed by excavation.	

## APPENDIX B PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 31	
<b>Photo Date:</b> 9/20/2013	
<b>Orientation:</b> South	
<b>Description:</b>  Bank repair area following brush clearing and removal of the plastic sheeting that was covering the area.	
<b>Photo No:</b> 32	
<b>Photo Date:</b> 10/4/2013	
<b>Orientation:</b> West	
<b>Description:</b>  Bank repair area. The area was stabilized against erosion using EnviroLok® bags.	

## APPENDIX B PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 33	
<b>Photo Date:</b> 10/8/2013	
<b>Orientation:</b> South	
<b>Description:</b>  The completed repair area viewed from the dock. The surrounding bank area has been stabilized with jute matting.	
<b>Photo No:</b> 34	
<b>Photo Date:</b> 10/4/2013	
<b>Orientation:</b> NA	
<b>Description:</b>  Excavation area around historical sample location OP02SS.	

## APPENDIX B PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 35	
<b>Photo Date:</b> 6/30/2014	
<b>Orientation:</b> East	
<b>Description:</b>  Removal area for sample location RAC-2.	
<b>Photo No:</b> 36	
<b>Photo Date:</b> 6/30/2014	
<b>Orientation:</b> East	
<b>Description:</b>  Removal area for sample location RAC-2.	

## APPENDIX B PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01



**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<p><b>Photo No:</b> 37</p>	
<p><b>Photo Date:</b> 7/2/2014</p>	
<p><b>Orientation:</b> East</p>	
<p><b>Description:</b>  Backfill at removal area for sample location RAC-2.</p>	
<p><b>Photo No:</b> 38</p>	
<p><b>Photo Date:</b> 7/2/2014</p>	
<p><b>Orientation:</b> East</p>	
<p><b>Description:</b>  Jute matting installation at removal area for sample location RAC-2.</p>	

## APPENDIX B PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 39	
<b>Photo Date:</b> 10/9/2013	
<b>Orientation:</b> Northwest	
<b>Description:</b>  Bank stabilization with jute matting prior to hydroseeding. The concrete counterweight blocks are visible on the left.	
<b>Photo No:</b> 40	
<b>Photo Date:</b> 10/9/2013	
<b>Orientation:</b> East	
<b>Description:</b>  Revegetation by hydroseeding. The concrete counterweight blocks are visible on the right.	

## APPENDIX B PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 41	
<b>Photo Date:</b> 10/9/2013	
<b>Orientation:</b> East	
<b>Description:</b>  Completed paving restoration of the discharge piping removal area, the manhole area, and some of the gravel filter area. The majority of the filter area received topsoil and was hydroseeded.	
<b>Photo No:</b> 42	
<b>Photo Date:</b> 12/9/2013	
<b>Orientation:</b> Southwest	
<b>Description:</b>  The bank repair area after two months. Grasses have taken root along the bank and on the EnviroLok® bags.	

## APPENDIX B PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 43	
<b>Photo Date:</b> 12/9/2013	
<b>Orientation:</b> East	
<b>Description:</b>  After two months, grasses are taking root along the jute reinforced bank stabilization areas.	
<b>Photo No:</b> 44	
<b>Photo Date:</b> 12/9/2013	
<b>Orientation:</b> West	
<b>Description:</b>  The former gravel filter area.	

## ***Appendix C***

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### **Field Notes**

**Outdoor writing products®  
for Outdoor writing people**



*All components of  
this product are recyclable*

***Rite in the Rain***

A patented, environmentally responsible, all-weather writing paper that sheds water and enables you to write anywhere, in any weather.

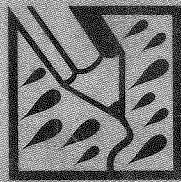
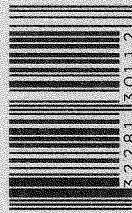
Using a pencil or all-weather pen, *Rite in the Rain* ensures that your notes survive the rigors of the field, regardless of the conditions.

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*Rite in the Rain®*

ALL-WEATHER

**TRANSIT**

Nº 301

Pier 99-Removal  
Action

9/9/13 - 9/20/13

Book 1

9/19/12 onsite 800 Overcast (60's)  
 905 onsite.  
 Pierwest Harbor Master  
 Ben Harrison 503 891-5074  
 1115 Begin clearing w/ weed eater around  
 old crane pad.  
 1155 JJ offsite for different cutting equipment  
 w/ weed eaters aren't working  
 still slabs offsite for lunch  
 1235 TH onsite from lunch  
 1240 JJ onsite w/ larger weed eater w/  
 steel blade  
 1250 Get a hold of Tom Burton.  
 - Flood wall marking is elevation  
 one! w/ an offset measure  
 from city marker Datum: NAD83.  
 Call JF, message, email.  
 1310 Discuss w/ JF. Doesn't seem  
 right. He'll get back to me  
 1330 JJ tries using ex to help clear  
 loose vegetation. Difficult to do w/o  
 disturbing soil. Aggs about not disturbing  
 soil if in regards to silt fence  
 installation. Cap fence is installed &  
 then ex used? NO, don't want to disturb  
 soil & erosion potential.

1400 Call from JF. Corrected from  
 Vancouver gauge, river as st  
 elevation of 4.3.  
 From duck egg vegetation line is  
 approx 9' above current river level.  
 Inform John.  
 TH wants to use ex to assist in  
 removing vegetation. John okay,  
 can't have any soil/rock ball in w/  
 vegetation. Soil exposed w/ rock, clay.  
 Relying on TH.  
 observe lots of trash & debris  
 1.5" wire rope just east of former  
 crane tie-in.  
 1415 Joe (TH) onsite  
 1500 JJ brings laser down to find elevation  
 for other  
 - Bryan: EPA leaving Seattle 1 way  
 and onsite  
 Bryan Aggs what reason for not disturbing  
 soil. All USACE leave & don't  
 want to disturb  
 - Est. 17.6' (based on river clay)  
 to be @ 14' on 14' steel down  
 from building

expose partial drum exposed w/  
fence around/post exposed cemented  
6' down from building concrete space  
entrance

1600 Find old but fuel tank  
Covered w/ plastic Drum gradient  
of building 1/2 way down  
furnace shaft of eastern stairs. 16'

down from building

PID @ Pipe 0.0 ppm pickup  
End of Tank, too aggressive.

2" 30" 13 1/2" 68" irregular shape



Blackberry's fence  
Elev. 12.6

2" 30" 13 1/2" 68"

2" 30" 13 1/2" 68"

2" 30" 13 1/2" 68"

2" 30" 13 1/2" 68"

1600 Setup Construction fence

Byron EPA still stopping outside  
this evening

Confirm w/ Jim that Apex  
wants to be onsite

1740 TH offsite

1755 EPA onsite

Walk site w/ EPA + ENE

Angie seems happy w/ progress  
Asks about ~~draw~~ tank said

it would be removed if the  
area assessed to decide if further  
action is necessary.

Discuss confusion w/ high water  
marks/location

EPA onsite @ 7 tomorrow

EPA + ENE offsite

1630 Apex offsite, secure fence.

Call from John Arroyo to finish

6

9/10/13

650 onsite

mostly clear (60's)

650 arrive onsite. TH onsite w/

large Volvo EC220LC excavator.

700 Bryan ~~AA~~ (ENE) & Angie (EPA) onsite.

Survey offset mark on wall

14' offset. Check for mark on

stair case, find old stake below

past level. Inform John. Will verify

w/ user level.

730 Tailgate Review.

- JJ put stake in place not surveyor

Surveyor didn't put marks down

bank.

- Check ~~offset~~ <sup>stake</sup> w/ eyes

EPA. No marks.

740 - JJ measures, places peg (top of post)

at 17.6' elev based on 14' offset mark.

photo taken

TH prepping harness gear. we trees

pulled to west of shop w/ LOTO

as harness pt of tree for anchors.

750 begin weed eating

805 Angie: EPA uncomfortable w/ inconsistencies

w/ Surveyor. Asks if he's licensed.

requests remaining, accurate measurement

7

- Call JF. Explain lack of marking and confusion. Says he'll sort it out and keep working.

830 TH working from west staircase of shop. Joe & Sam tied off to truck.

JF spotting, operating crane and doing observe work of garbage debris.

835 Known on house door to engine about cars park. Motion the way but clearing is throwing up lot of debris. Not house belongs to gentleman in house. People in but messy.

840 Find pipe (metal w/ rivets) in end approx 18-24" (will verify) of slight eastern angle. Discharge w/ 15" east of western stairs.

EPA off site for approx 1 hr.

845 Call from JF. Surveyor arrive soon.

JF onsite & will go through process of get sorted out. Bryan notifying Angie. Left Messy.

Rite in the Rain.

Pipe has riveted plate (concrete)

possible tank or boiler

24" diameter, 10' east of stairs  
large metal box ~10-15' further  
east from pipe-line tank

900 TH close to OTHL Stop cutting,  
begin raking

905 JF onsite. Review progress

920 Surveyor onsite

John meets w/ Surveyor & discusses  
will place hubs adjacent to stairs  
will discuss w/ EPA

-CC needs GPS, JF to take back  
I'll need him to locate debris

945 Large metal box is open w/  
Pipe @ Top, hole in side near  
base.

1045 JF offsite. Mit okay w/ further  
clearing below functional OTHL  
but wants EPA or other authorization  
for go ahead.

Surveyor setting up on east steps

1100 Verby West Stair high water  
line. Chapman to set of rules  
good TH clearing around  
blows

1205 Surveyor described markings just  
east of billboard is the property  
line w/ ODOT R.O.W.

Surveyor PMS labeled 12-16  
on asphalt concrete

1210 Surveyor offsite

1145-Brake TH back

1220 Angie onsite

Hunk onsite, offsite 1230

1235 TH return to work. Discuss w/ JF

Moving concrete blocks w/ JF. Will  
hold off until more experienced  
person onsite that removed dig.

JF can't dig of concrete

1315 JF called. Waiting for last bit of  
info, doesn't think we need EPA  
approval b/c not disturbing soil only

clearing w/ 11' cut back

AV monitoring: PID: 0.0 ppm.

- Breathing space & clearing activity

Rite in the Rain

1340 Dan (FBI-EPA) onsite Review

Project w/ Agree of Bryan  
 reason for DSL/MED noticed

- Recommends lawyer contact &  
 going through DSL or MED  
 & suit process. EPA can issue  
 letter of approval but with info  
 for a med given by it & attorney

1415 JF call. DSL & MED give green light  
 to clear RB below, no permits  
 needed. No 811 disturbance clearance  
 below OHV. JF asks to relay to  
 EPA / Bryan.

1420 Dan (EPA offsite)

Frank ~~off~~ onsite. Asks for update.

- Q: Will still fence go up at other  
 before or after clearing?

1425 Nick & Don's site to move concrete  
 blocks.

1440 Home ~~site~~. Don's site for

rigging equip. TH wants to

clear ~~line~~ other. Then the

buffer being trucking that

Separately

1450 Dan for ruling req.

Frank, Nick, JF focusing on block

- Belly band around 4th, chewing  
 to anchor pt.

- looking for insurance.

1500 Call from JF. Asks about

EPA info. All parties seemed

happy & agreed w/ approval

informed. Frank, JF says not change

3/4 still to this time, just confirm

then received & realized.

1520 Close door in way below blades

- Ten screws released.

1530 Begin slinging blades off back

positioned on dock to ease

walking during lifting process

1630 Finish slinging up blades

- ~~16~~ 16, 011 165 end

1640 Prep to sling up stairs

1715 Home offsite

1725 Nick/Dan offsite

Collecting GPS locations for

debris subjects (Drums w/ rocks / concrete)

things, etc)

1745 ~~1745~~ 1750

Rite in the Rain

Inspect water line. No sign of vegetation  
in water from days activity of  
remaining stairway.

- Black gangway w/ Dumpster & Candles & Auto  
17875 Mors offsite. Secure site.

Body who parks @ east side of shop  
inquires about parking. Explain  
bank is environmentally of bank  
stabilization. JJ okay w/ her parking  
as long as she's moved by 7am

II

9/11/13

0830

1m onsite

Clear 670's

0830 Arrive onsite

Andy (EME), THT (JL, Joe, Sam)  
onsite already

THT taking at eastern property  
area. Tailgate Mtg

JL asked about garbage separately  
from vegetation when talking &  
beginning. Talking time!

900 JJ offsite

935 JJ onsite

945 Scott (THT) onsite Tailgate  
op. weed eater

1000 Call Harbor master about shed

Garbage, doesn't think it's used &

can be moved if in the way

Call from JF. wants to verify

that clearing is ~~not~~ cutting as close  
to shore to minimize material

root material, if treated as continuous

1010 Conduct morning inspection of water line.

No evidence of material from clearing  
entering waterway. Photos taken

## A.V. monitoring

1015 (morning) PID: 0.0 ppm No Action

1345 (Afternoon) PID: 0.0 ppm No Action

1735 (Afternoon) PID: 0.0 ppm No Action

1020 SF of Spn onsite

observations ~~at~~ East of Shop, smooth soil- Priority, Clear around fire area  
area Cut back

1035 MIDD onsite, no fire, offsite

1045 TH begins clearing in Cut back area. Sam Harnessed, JJ @ safety watch

1115 down/stn offsite

Andrew (ODOT) onsite

Q: Soil sampling on bank? not expected

Request: Soil data near ODOT ROW

- Final action Plan

1120 ODOT (White Andrew (ODOT) (803) 207-6774

1150 Break for lunch

1125 TH return to work

2 guys walk past TH exclusion sign @ Shop to walk under IS

JJ informs area is off limits

to pedestrians, Resp. was we saw

on break of day kept walking

- Verified sign was visible

- Put caution tape across

drive way entrance at east side of Shop

1240. JJ wants to agree on ODOT to set 3 ft fence bk

clearing below will be T/M

huber. Explain area is still

high water, Even though

future prices will be worse

17.6' cur.

1300 TH break

1315 Resume. Reposition truck

observe 3 4 gal paint cans

in area west of Shop all ODOT

open, no liquids remaining

1345 mid day air monitoring check

view for debris from clearing activity.

1430 Raking/clear down from Shop

W. assist w/ hauling dirt to

staging area so that ex

can move off bank

Return to the bank

JJ talked w/ Hank, working daylight. Not working Saturday. Planning on having temp. laborers onsite tomorrow, verified note trained

1630 Peeling back vinylscreen  
Metal debris including  
rotted gutter & steel beam  
dead blackberries

1640 Fill area ~~was~~ east of cutback

~~also~~ includes misc. Car parts  
leaf spring, muffler, engine/gasket  
Scott Craig offsite approx 1100

1710 Anyre onsite. Asks about clearing  
split fence. Still confusion about  
OHV definitions & order of operation  
asking if split fence going up before  
continuing below 176. Anyre NO

ENE happy w/ choice, under impression  
SF talked about "reaching over fence  
to clear below" but more than  
happy to defer to TH regarding  
standard practice

1745 TH using EX to ~~take~~ take cuttings  
into below west stairs & shop.

Spotted for Power lines

1850 Anyre offsite

Issue of ~~start~~ walking /  
approval of DOL not for  
and were not from liability  
of EPA & something should appear  
→ Anyre to rescind / consult  
w/ manager & contact SF  
tomorrow.

1910 Andy offsite. TH cleaning up

1920 Apex offsite

TH loading equipment, securing  
site

9/12/13 705 PM onsite overcast (H-10)  
 705 Arrive onsite. EPA (Angie), ENE (Andy),  
 TN (JJ, Joe, Sam, Scott), TCB (Charles,  
 Yarrowing)

Conduct Tailgate review. Mike Sene  
 new groups know the requirements,  
 and Safety concerns.

720 TN & crew working at eastern  
 portion of working waste pile  
 it's cool. Sam, Joe Scott &  
 Woodentons

740 JJ. Effort for materials, need  
 to minimize material being  
 flung into river.

830 JJ onsite

850 JJ asks about extent of lower clearing,  
 & walking. Said it is easy to leave  
 buffer to help keep material on bank

don't have to clear both

855 observe green sand in slope

down gradient from main power  
 line. & straight out from line  
 at billboard posts.

investigate w/ ENE, Concentration of

field screen. No green

PID: 000 ppm.

# Description

sand (SM), D greenish gray (M) (SLF 12 1/4 / SBC)  
 to brown (7.5 / R 1/2). dry, box, fine to  
 med grained, 45% fines, some organic debris

Time	Monitoring	PID		Action
		Readings		
930	Morning	0.0 ppm	None	
1300	midday	0.0		
	afternoon			

930 Angie: Asks that of JF include  
 contact of various with yesterday  
 just so EPA knows

935-935 TCB Smoke break

Angie also inquires about NED  
 visit yesterday. Explains that they  
 had been in conversation w/ JF  
 & pressing by. We sent inspection  
 & would follow up w/ JF later.  
 -NE Site bulk, Angie would like  
 to know

940 EPA eff. etc.

-JJ marking 17.6 elev. ASD about  
 effort below to functionality. OHLE  
 it is cut, but some debris is  
 left

Return to the rain.

Respond that we want major  
veg debris gone, but don't need  
every dead ~~BB~~ <sup>BB</sup> removed. Focus  
effort above 176'

1000 Call JF, give update. Will be  
onsite later.

1030 Morning river inspection. Some  
Swamp BB stems in water.  
Very few, mostly smaller than 6'  
up to 18".

Observe remains of wooden boat.

Point of 1 side partially exposed.

entirely below 17.1' elev.

located ~25' (est. vis. dist.) down  
from west edge of cable crossing  
sign.

→ 8mm 3/4" Conduit was visible  
mid bank, below shed, on surface,  
appears similar sized conduit  
displayed @ water edge @ crossing  
TH to get ladder back out

1125 Andrew (DOT) onsite to photograph  
silt fence. Put up. JJ says  
up around 230-3. Andrew will  
be done.

- Explaining project.

1150 DOT offsite

Break for lunch. TCB offsite

1210 TCB onsite

1220 Call from JF

Mtgs onsite @ 1-3

230 Shadow w/ Stu, doc recommended

1235 Return to work

JJ & Scott return to work

1245 Return to work.

Hector (TCB) onsite

TH (scott) begins installing silt fence

1300 Sun weedwhacking below ship. Rest

at crew walking east of east stairs

JD running rope for Sun

1320 Annie onsite

1325 John & Stu onsite

1330 Hank onsite

Walk site w/ Hank, John, Stu.

1425 IM of Stu offsite.

9/13/13 1 Mon site 820

820 Apex of JJ onsite. Access Exclusion area

830 Sam onsite

Tailgate Safety review

EPA &amp; ENE not onsite until

afternoon unless we remove tanks.

JJ has Andy's # &amp; will give the

Notice.

TH installing salt fence

Tasks

- Salt fence

- Remove ~~ground~~ blast shield, place on plastic

- Empty contents of burn box/tank/loopholes west of stamp

- Remove boiler tanks

Air Monitoring Reading Action

930 morning 0.0 ppm NONE

1330 midday 0.0 ppm None

Afternoon

1050 JJ offsite for loadings for Stockpile area

Sam Sweeping

1145 JJ onsite, Break for lunch

1215 Return.

Inventory Equipment: Rigid Buck Teeth  
SL-26

1230 While assisting TH w/ Snake cable observe 8" ductile pipe entering

MIL from South

1300 Hank onsite

1310 Call JF

Hank requests clarification on

① Blasting unit JF: Contaminated / Sample by cheapest method

② Ash from tank stockpile,

if just wood waste, could

Spread onsite when done

③ Pipe: Don't Pot-hole, follow Puller &amp; carefully to explore

- Track time / effort 4c TLM

1310-1315 Probe 8" ductile pipe

- Terminates ~ 18" 24" from cat

Plugged / observed

1315 Return to discharge pipe, put box

away, Hank &amp; TH discussing

~~1330 Hank offsite~~ 1330 9/13/13

1325 Show Hank / JJ photos from 9/10/13

locates for cable markings

1330 Hank offsite, JJ mis-  
excavator to look for end of pipe litter in the rain.

Removing concrete debris, other debris, present (glass, wood, metal, asphalt & concrete)

17105 Andy (ENE) and/or

TH had digging 5/6 proximity of utility trench

14120 Removed concrete debris &

~~see exposed~~ - 2.5-3' below asphalt  
concrete, adjacent to utility corner.  
- no sign of pipe

14180 Call JF give update. MOB to

other tasks. Regroup on pipe nearby

Pop MA lid & from source, pipe goes toward hollow. Girls shovel & hand dig.

- Find more green blasting sand  
JJ ~~thought~~ said he observed chemical odor. Material ~~partially~~ covered

Incidentally, could not find screen. Did not observe odor. Will return & field screen

14155 MOB to burn box, try to find

box & contents, minor amount of

contents (apparently ash) spilled

from lower NW corner. Filling bucket

as a support of shovel into Ex bucket

~~see~~ <sup>Sand</sup>

Box Contents: ~~ASH~~, 80% from above  
brambles, large fragments, section of  
carpet of 2nd white plastic container  
bottom appear unburned, 12"x24"  
Corrugated metal

1515 Three in plastic in asphalt concrete

1520 Collect gas sample to field screen

PID 0.0 ppm

Screen test: 100 Screen.

Material: Sand fine grained, brown not white.

Some foam fragments up to 3" observed.

Observe a sample of blue paint

flecks during screen test

1610 Contents out of box. west of back

Sides rotted out

1615 36" dia buried corrugated pipe  
under box. Ash of burnt material

inside. TH est 1' deep

1620 Call JF w/ update.

- Show contents of burn pipe,  
add to ~~screen~~ covered off pipe  
& full pipe

- Monday, probe for more sand blasting  
grit.

Return to the rain.

1430 Pull down pipe

1640 Begin investigating "Boiler tank"

Pull boiler up slope to minimum disturbance. Find rail line

1645 once on level ground clear logs

begin to pour onto ground. Possibly

thin water? Prep and up on

Cribbing.

Field screen w/ PID into open end of tank. PID: 0.0 ppm

Probe w/ 3/4" PVC, oily sludge, odor est. 1 gallon lost into ground

Secure tank & put danger tape

up around debris

~~THAT'S IT~~ Apex

1700 Call JF. Explain that it can't be

moved w/o spilling. Wentt it

Secured to everyone's satisfaction.

1715 Andy requests that S.O. spill

loc. is shaved up.

Everyone is happy w/ this tank

is situated & leaving over weekend

to empty.

TH removes less than 5-7 gallons

length of soil. Just over what

would fit in 5 gallon bucket

1720 TH setting up containment around

Boiler tank

1725 Andy offsite

before leaving. Confirm he

is satisfied w/ storage of tank

& metal debris on west side of

Shop & is properly delineated

Boiler tank sketch

Diameter



offsite 1745

9/17/13

onsite @ 1020 Tailgate release  
1035 Sum offsite

TH to cut open tank & dry clean  
emptied tank & contents.

2 full drums, 1 partial drum  
that includes TH pump down

1100 Hank onsite

Nick & JT stripping pipe to  
pot hole

- Able to get past obstruction.  
- Hank sees about green line  
delineation. No action yet.

- Says JF okay w/ adding to  
end of pipe excavation

1115 Push Sode through, find end  
of pipe. Mid break, just past  
utility corridor

1120 GPS end of pipe, Sum onsite

1125 Call JF End of pipe is blue  
original 2 pipes of green line.  
- all should be removed by  
ex. 1st. Clean pipe

1125 TH mobs to cut open tank

- CO<sub>2</sub> tank putting CO<sub>2</sub> into tank

TH checked w/ LEL prior to cutting

02 < 19.5%, Cutting open w/ chop saw

1145 Andy noticed smoke in

shop / roof from sparks from

Cutting, immediately stop, TH

move down roof w/ water of

stamp out hot spots

1200 Cutting torch, jump in surroundings

area. Hank off site

Hank sees about 11m

- IS TH good to go ahead?

Full pipes were for regading?

- Then to seal rope through

pull plug through to clean

pipe

Air Monitoring

1200

PID @ 0.0 ppm

1315

- Cutting Tank

1315

PID @ 0.0 ppm

1410

PID @ 0.0 ppm

1420

Sum offsite for O<sub>2</sub> low torch

1220

Nick & JT sum rope down pipe.

Apex & ENE in fire with

Rate in the Rain

End of pipe is Corrugated metal  
DIA. 12" plaster

1245 Sun outside, TH Break for lunch

1315 Return to work

working view of tank

1340 Have cat cleaning cutting gear,  
allow to cool

1400 Begin third cleaning

1445 Done cleaning tank, stage down

cleaning  
1455 ENE offsite

1505 offsite

9/18/13 P. sunny  
(50's)

700 Arrive onsite. SS & Sun outside  
w/ minor Ex.

Tailgate Safety review

715 TH has to begin pipe cleaning,  
dry clean ~~not~~ by pulling block  
through pipe.

- Apex: begin to locate historical

sample PA WS0255 GPS

hydrotest file is off by 10K mly

- Enter new pt by bathym Commander

Wm ~~126~~ ~~126~~ 106 feet.

Corresponds w/ Google Earth  
map. Mark location.

Air Monitoring PID

715 (End of RE) PID @ 0.0 ppm

1050 (Pre Ex) PID @ 0.0 ppm

1330 Asphalt Cutting PID @ 0.0

Action

None, ~~Enter for~~

None

None

Rite in the Rain

750 Clear channel onsite to change billboard, onsite for zoning.

TH tries to pull to clear pipe  
1st attempt was clean paint on

810 West Coast Marine onsite w/ drop box

820 West Coast offsite

TH pulling partially de-lated basketball things pulled out more small ones, similar to Filter ~~the~~ valves

900 Call JF w/ update

okay to pull Corrugated, Seal /st  
Must weigh concrete.

-Reconfirm end of Pipe Ex extend

De-lamination at End of Pipe  
Excavation

-End of end of pipe

Sand w/ silt, brown, No odor

710 @ 0.0, NS. Organics, concrete debris, some pains of leaves

Identifi black plastic resin, hard, braces when fence applied. old

talker No odor, No PD, no green, dry 1 solid.

920 Andy onsite

-Note talker 3' below  
E.O.P., concrete

-5' E.O.P. Fill debris, no talker  
-3' East: Put hole 1' rock, concrete

Strong brown Sand w/ silt

60% Sand, w/ silt, ~~no PD~~

710 @ 0.0, NS. No odor, No

Talkative

-5' West E.O.P., below green sand

-No green sand present, bring sand w/ silt (11) fewer rocks

710 @ 0.0, NS, No odor dry

Put hole around visual extent of green sand

NS  
No Green Sand  
710 @ 0.0  
No odor, odor

(G.S.)

710 @ 0.0, NS  
710 @ 0.0, NS  
710 @ 0.0, NS

710 @ 0.0, NS  
710 @ 0.0, NS  
710 @ 0.0, NS

710 @ 0.0, NS  
710 @ 0.0, NS  
710 @ 0.0, NS

Rate in the Rain

- 950 Moving small shed out of way  
 1000 Began to Ex Corrugated Pipe  
 w/ main GDD E  
 1020 Call JF. ~~not~~ verify that pipe  
 overburden can be side cast to  
 be reused, yes, will go back into  
 hole  
 1120 Break Excavating  
 JF on site  
 1130 E.O.P. Excavation area.  
 - Bring lower extent down  
 from flgs, ~4', only done  
 1'  
 Close to pipe, 2-3' bgs  
 - Oreo Sampling  
 - Pile Ashy debris, 2x802.  
 - GBS ex Area  
 1210 JF off site, Sum cutting asphalt concrete  
 1215 w/o water, creating a lot of dust  
 1212 Steps  
 1215 TH off site for lunch & box  
 1225 GBS extent at E.O.P. ex  
 1240 Charles Schwartz (ODOT) on site  
 Photos taken. Inquiries about removal  
 of pipe & work in ROW.

- Identify pipe to him & describe  
 Scope of work in ROW  
 1245 TH on site, ODOT off site  
 Start on site today off equipment  
 1255 Resume Ex. w/ SOD  
 1320 Began cutting asphalt concrete  
 South of site  
 1340 Began removing asphalt.  
 S. of flgs  
 1350 Thunder observed earlier  
 appears to have been protection  
 coating on Corrugated Pipe  
 1400 Find Pipe transition  
 1415 Remove majority of Corrugated  
 pipe, ~20' lined w/ Trencher  
 ~3' remaining at Concrete Joint  
 1425 Contents of small section of  
 pipe spilled while trying to  
 remove Corrugated Pipe.  
 Hand Shovel. ENE heavy w/ Extent.  
 Collected GBS of Transition to Concrete  
 1435 Cleaning pipe. Prep for end of  
 Pipe excavation

1440 Began by removing Top 1' over  
 identified larger extent of large EX  
 following Small "Vein" by hand  
 Shoveling. lots present. Take sample  
 lens of green sand continues,  
 approx 3' below surface. Have all  
 residue in 1" area until SE  
 consulted.  
 1545 1st pass done. Walk w/ ENE,  
 do not locate any more green  
 sand. Ground up for woodchips  
 approx over 3x3, east of  
 pipe area.  
 Excavated area approx 26' across,  
 x 20'. Large concrete blocks  
 made it difficult to only 5' in  
 1' off surface. Spores upto 3' present.  
 Andy spoke.  
 TH place small sample in  
 dropbox.  
 1645 Place mine EX. arm in trench,  
 Place delineation around  
 Top of pipe 4.5' by 2' asphalt +  
 concrete pad

To Talk w/ JF about:  
 - Green Sand lens  
 - MIN Vail  
 - Computer testing  
 1635 offsite

SO's - Logan

7/19/13 1M onsite

715 Apex onsite.

Joe / Doug onsite w/TK.

Tailgate Doug Says West Coast  
onsite @ 9:45 for Drop Box

750 West Coast onsite.

Call JF to verify okay to take  
offsite.800 Doug Says manifest, West Coast  
offsite.

810 JF onsite

855 JF offsite

- Review EOP REX area, identify  
sample locs

- Discuss Green Sand test, will remove

- WSOZSS discussion, need to get  
loc marked down 5' red removal, 1'

930 Collected VOA Sample from drums

Tank only, water, 3 bags

Name "Tank water"

940 Decon Sampling Equipment

1000 Andy onsite

1010 REX-1 (0-0.5) 2 JWS, 1000 ppm

Silty sand 8' off site, brown clay, ~~highly plastic~~

8' off site, 10' off site, 10' off site, 10' off site

8' off site, 10' off site, 10' off site, 10' off site

10' off site, 10' off site, 10' off site, 10' off site

1020 Collect REX-2 (0-0.5)

PID=0.0, No Green

Silty silty sand, brown, w/ green  
loose organic particles present, dry

800 Sand 10' off site, 10' off site

1040 Collect REX-3 (0-0.5)

PID=0.0, No Green

0-3" Sand w/ silt, brown, dry,

med. dense, becomes lt. brown

Sand (beach sand), loose, dry

3' 1.1% to no silt. No green

105 Andy offsite

Collect G-PS Locations

Finish Field Screening

Decon Bowls Spoons

1105 Collect Ash Stack Area Sample

1120 offsite

Doug Green Hydro (503) 969-3070

Rite in the Rain

9/20/13

1M onsite

P. sunny

(50's)

650 Arrive onsite. JJ

onsite

665 Scott C. on site.

700 Tailgate, preview.

Discuss plan w/ JJ. TM has pipe

flush (get) equipment onsite to clean  
various water & contents containedJJ wants to pull back filter area.  
Apex doesn't want to start today720 Plan to pull back triangle of soil /  
raised area left of the trench, contain  
sand blast grit. Drop box or place  
on filter?730 Call JF to discuss additional removal  
approx 5 yds material. Says to hold  
off for now, much bigger than thought800 Call from JF. Okay to ex. well.  
Remove & screen overburden & segregate  
from contain impeded sand blast grit815 Talked w/ JJ about well area  
& pipe setting. no bladder in  
way to block pipe & valve from  
above. Planning to place catch  
can & outlet of pump pump into  
drum.850 Start up US Jetting Trailer  
Jetter710 5th run w/ jetter. Translated shut  
sump pump. EX plug. water

Jet daylighted &amp; sprayed wide

Water from pipe jetting  
Contained in 1/3 drum

Containment

920 Marked w/ 255 w/ GPS Logging

Sent by Chris C.

Lat: 45.606289

Long: -122.68245

→ 7 satellites coverage loc is 5' east  
3' South of spot marked yesterday- TM did not need to remove branch  
access end of pipe975 Clean up Sump & Jetting equipment  
Some residual water & sed in

last remaining Corrugated pipe section

1405 Milt, Cathy, Tom onsite

Scam (TH) onsite.

955 JF onsite

1015 Scott &amp; BS at

Rite in the Rain

1030 M.H. Cathy, Tom, off site  
TH found pipe, 1" discharge  
pipe, 6" concrete heading to  
SE toward JS Bridge  
JF off site.

1050 Plan is to mark it & plug 6" in  
pipe, keep trenching & pulling  
pipe

1130 Having to re-cut asphalt concrete b/c  
pipe run. Hand removing pipe  
segments, placing pipe/fragments  
on plastic

### Air Monitoring

Time/Area	PID Reading	Action
1130 (Pipe removed)	0.0	No action
1300 (Pipe removed)	0.0	No action

1140 Observe discolored layer 6" below asphalt  
concrete base, up to approx 1' thickness  
field screen. DR Gray Silty Sand w/ some  
gravel. PID 5.8 ~~15~~ 9 ppm, no green.

1200 Chf JF

Says to Side Cast discolored material  
w/ pipe fragments. Can go out next  
week w/ soil.

1210 Break for lunch

- Discuss w/ JJ. Can segregate top  
18". Some material already mixed  
w/ clean overburden. Min. mix and  
before it was observed

1225 Return to work.

JF wants to know if it gets  
thicker or if soil volume set aside  
gets too large.

JF Skimming surface under asphalt  
concrete until visually clean

1240 6" in concrete cylinder @ edge of  
excavation, solid, sitting vertically 6"  
boring core or Portland cement plug

1250 JJ ASSES about compacton testing

Can't get someone out today. Does  
overburden that's being revised have  
to be tested Spec's don't specify. Call

JF. Not testing. Only test last 1 ft w/  
impact 1' FTR over burden. Should  
be installed in even, compacted lifts

Field Screen overburden Brown med.  
Sand w/ coarse sub-angular gravels, loose  
Some fines, <10% occasional cobbles &  
debris

1300. No more discovered Soil under

asphalt Concrete.

1320 6 inch concrete pipe to south. Clogged  
& not connected, appears to be debris,  
not connect to discharge line.  
left ~~to~~ Void under Asphalt Concrete  
to South of ~~the~~ trench. Section is 25'  
in length

1335 large concrete object along southern  
trench side w. M. Starts where  
6 inch pipe ~~to~~ section was found  
length 6', height, at least 3' depth  
unknown

1340 exposed corner is 9' NE of manhole  
12" wood form pattern visible on  
exposed face.

1340 Field Screen Soil, overburden.  
Brown med. Sand w/ gravels, loose  
N.O.D. P.D = 0.0 ppm, No shear

- Reach Manhole Vault. Remove remaining  
Pipe fragments.

1350 Begin backfilling

1400 Begin Compacting w/ jumping jack  
Style compactor. JJ offsite for fuel  
1405 Haulk on site  
1415 Haulk offsite  
1425 JJ onsite. Place Second lift  
1435 Compact Second lift

Field Screen Cylinder Tank &  
burn area pit.

Cylindrical Tank

Sand w/ silt. Brown, dry, loose.  
w/ angular large gravel. 75% Sand  
P.D = 0.7 ppm, No odor, no staining,  
No shear

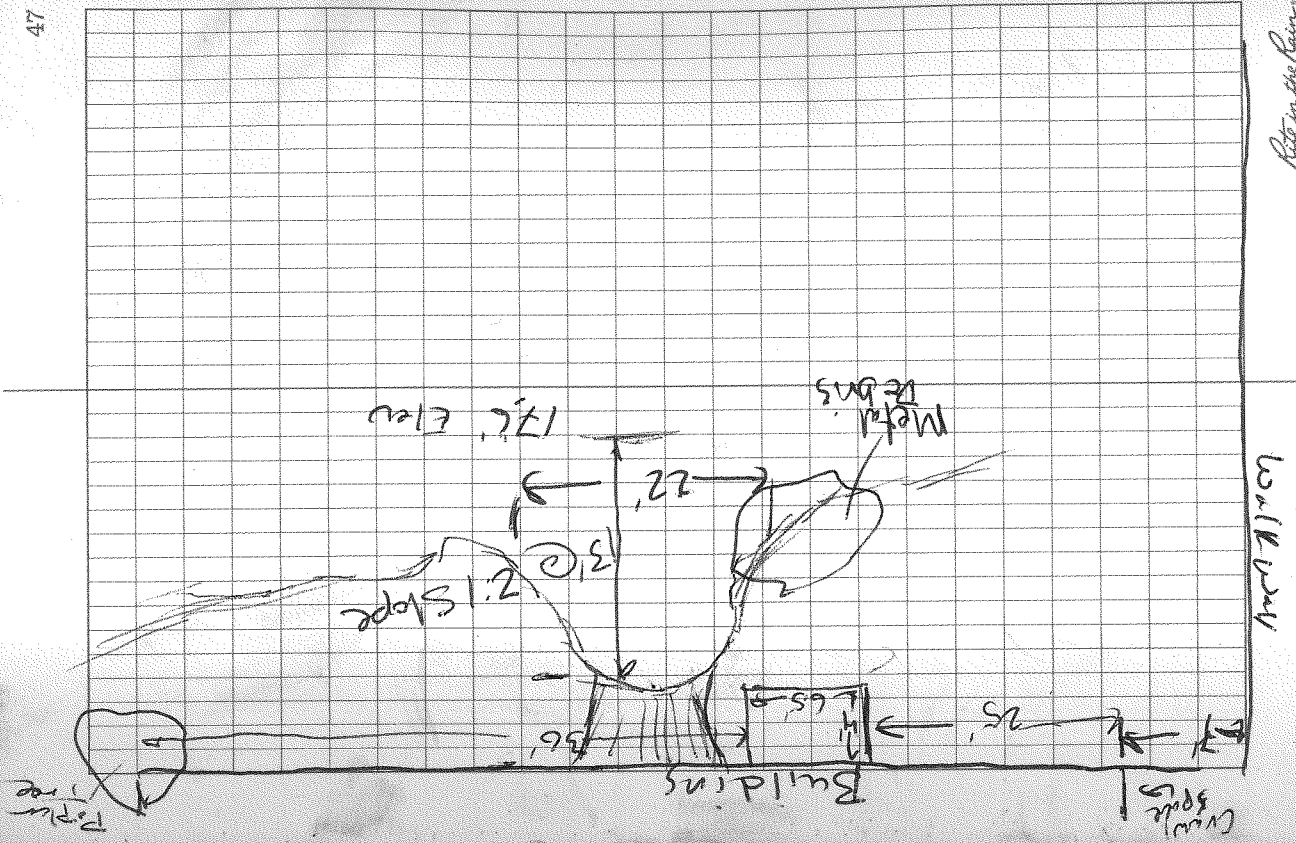
Burn Area

Sand w/ silt. Lt. Brown Dry, coarse  
Some gravels & organics  
P.D = 0.4 ppm. No odor, no staining  
No shear

1500 measure/sketch repair area  
see next page.

TH of clearing up  
1545 Plug Ex. by Manhole to block  
access.

Access control around trench  
w/ Dugout tape & candle  
sticks



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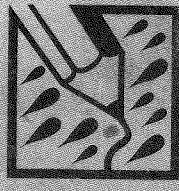
Item No. 301

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US Pat No. 6,863,940



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*Rite in the Rain*

ALL-WEATHER  
**TRANSIT**

No 301

Pier 99 - Removal Action

9/23/13

Book 2

7/23/13

1M onsite

Rain (50%)

705 Arrive onsite JJ onsite  
 710 Sam (TH) Andy (ENE) onsite

Tailgate

720 Begin work TH Planning to pull  
 rebar on bank. Begin moving soil  
 on bank to make access path for  
 small EX.

740 Identify small area of green blasting  
 grout adjacent to Grave Muroshog  
 Gaults.

810 Call from JF. Okay w/ plan TH  
 needs to get Envirolok bags.

- Check erosion  
 820 Sand grout layer 3-6" thick east of  
 Muroshog Pond. Usually Screening  
 segregating sand. Screening  
 w/ Ex. & Shovel by hand to minimize  
 generated material

JJ encountering a lot of large rocks  
 needing to be removed to build path

up to 2' boulders

835 Use large Ex to get green sand so  
 as not to pull material up into  
 a clean path

850 Encounter small area of blue  
 sand blast grout. Photos, GPS location  
 - Blue med grained sand PID: 0.8 ppm

- Slight, blocky green

920 Call JF Explain developments keep  
 finding sand blasting grout &  
 making significant disturbance  
 in bank to make trail for equipment  
 2-3' cut at top side of slope to  
 build platform. Must minimize disturbance

- Discuss options w/ JJ. Have to  
 get equipment there - do it  
 by hand.

940 Reply to JF via email

945 TH to work on removing vault. Do  
 not ask TH not to continue w/ path  
 until cleared w/ JF.

950 Call from JF. On his way  
 960 TH begins cutting around vault w/  
 chop saw

1010 JF onsite Road is defeating purpose  
 - Regroup on Repair, need better option  
 - Hand work likely

1050 JF onsite, Andy offsite

Rite in the Rain

# Measure repair area

35' long, 8' high. Est. 300 bags  
@ 24"x6" each. doesn't account for

top 32 bags

1115 TH offsite for lumber

1145 TH onsite. No soil today.

700 Start.

- Asphalt Concrete Vane 2 other  
Construction wastes?

- Inspect Erosion Controls. Everything  
looks good. No signs of channeling,  
sediment or migration to river.

1200 Apex offsite

Cloudy Showers

(50's)

10M onsite

9/24/13

655 Arrive onsite.  
TH & ENE onsite. Brian onsite for ENE  
JJ prepping for excavation  
705 Doing onsite w/ large dump.  
load cuttings  
720 Call from JF. Okay for vegetation  
to go to landfill. EPA onsite taking  
735 2nd drain line uncovered  
740 Doing offsite  
745 Brian offsite for Camera  
Fillups truck (standard size), no put  
onsite

## Air Monitoring

Time/Location	PID	Action
755 (Gravel filter)	0.0	No Action
765 (Gravel filter)	0.8	Exhaust from near
1245 (" " )	0.0	adjust location → none
1520 (" " )	0.0	None

755 Flood wall Sighting is ~27" from wall,  
bucket for long ex is too wide. Scrape  
Surface to footing & drag to wider parts to  
load.

Rite in the Rain

800 Three layer of vegetation waste  
in first & then time place filter  
Material over  
- 15' east of shop. Main line is  
22' below adjacent concrete pipe,  
- 2nd drain line runs adjacent to

footing. Parallel  
815 Filling's truck offsite. West Coast  
truck onsite  
830 Brian onsite

West Coast truck offsite  
845 @ West end of filter. Gravel layer  
18" thick over brown med sand.

915 ~~At~~ Collect GPS location for pipe bands  
& EOP Confirmation Samples & EOP  
excavation

920 Surveyor for MCTD onsite mapping  
leave

935 Finish GPS Collection

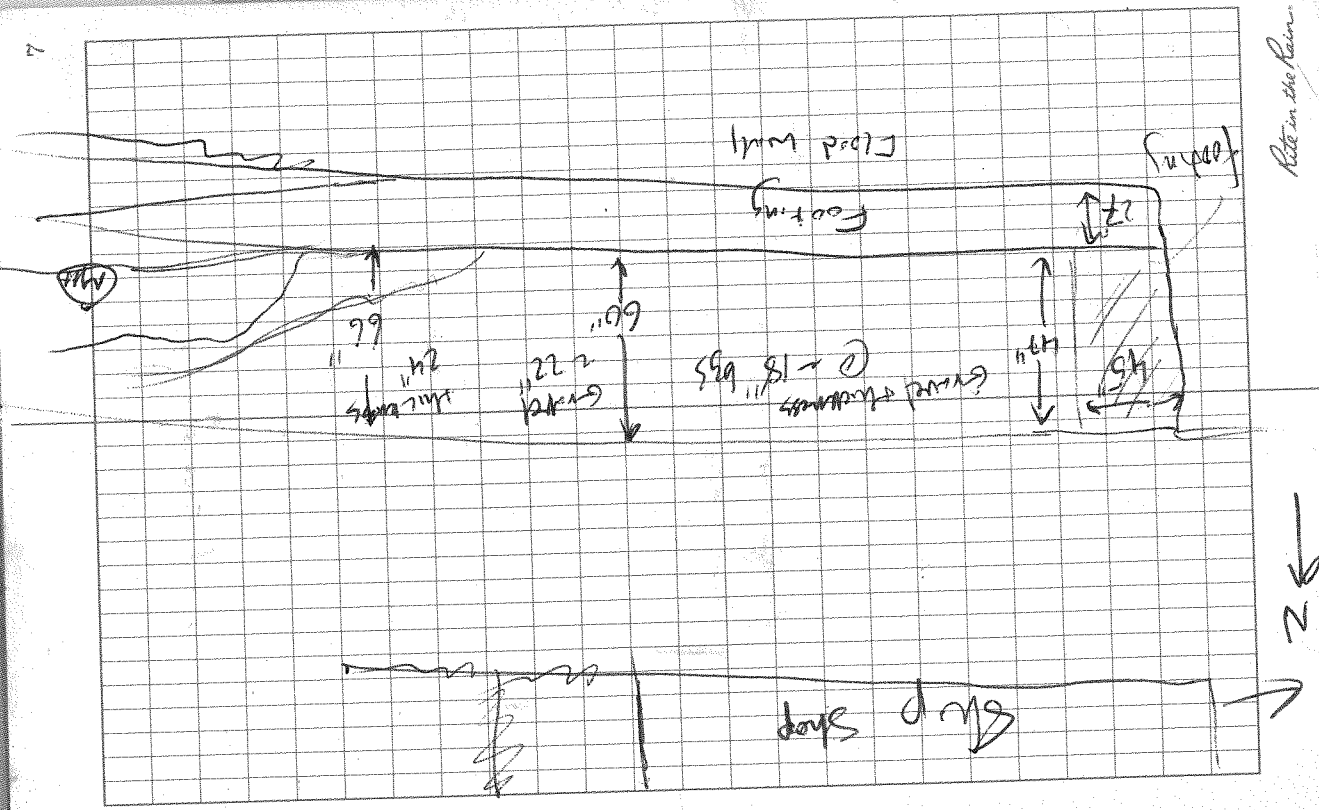
940 JF onsite

1000 TH truck onsite

1010 SP offsite. Arrive 415 min late

Truck 1 (TH): 15 tons

1035 5<sup>th</sup> truck onsite



Rise in the Rain

- 10400 Anyce (CEPA) offsite  
 1200 Verified w/ JJ shut & truck  
 have gone out.  
 w/ JJ Collect Confirmation Samples  
 Tomorrow.  
 - JJ Need to leave trench open  
 pending analysis  
 - JJ offsite
- 1205 Anyce offsite  
 truck onsite  
 Hank offsite
- 1230 Doug onsite w/ TH truck.  
 - 3rd trip, truck 7.  
 JJ loading pipe fragments & Soil  
 from pipe Ex. into truck  
 spin on standing while JJ loading  
 Doug's truck  
 1315 Doug offsite w/ 7th truck  
 8th truck onsite (Fillips)
- 1345 Concrete structure adjacent to footing  
 ~1' below footing, ~12" wide, extending from  
 Manhole to +
- 1400 6" Corrugated Plastic on top of Concrete  
 Pad, 3.5' below road surface  
 10' W. of Vault. Ground thickness ~48"  
 Blue print visible in filter sock on  
 North side wall adjacent (west) of MHT

- Green Sand visible on footing.  
 west of MHT for 15-20', scattered.  
 Will remove before final surfacing.  
 1410 Truck & offsite. No additional  
 trucks. Brian notices cracks  
 in Concrete road surface slightly wider  
 & rindier bottom
- 1425 Pull Vault. Base remains in  
 place. Pipe to South was sealed  
 w/ poly board when form for footing  
 was poured. Soil behind  
 verify base was not connect / proceed  
 w/ footing before continuing  
 - Remove Vault & Base
- 1435 Set up stakepile area & use small &  
 Continue removing material
- 1530 field screen ground filter stakepile  
 no screen, PID: 00 ppm. ~~Grout~~ Sand blowing, used,  
 base w/ gravel filter material  
 - ~~Grout~~ Gravel filter area 1/2 way  
 down sharp & Vault @ footing over pour  
 PID: 00 ppm, No screen, Paint Holes  
 Sand, brown mud grain, partly gravel  
 → Remove Grit from footing, brush into  
 trench, prior to ~~to~~ to grade. *Return the Rain.*

-- Bottom of ex, 15-20' west of SE corner  
of Shop; not final depth  
PID: 0.0 ppm, NS

Brown sand, partly graded, med grain,  
little to no fines

-- Sand West gate from step testing

PID: 0.0 ppm, NS

Med-Coarse grain, partly graded, green  
some silica present

1630 Angie (EPA) onsite

1645 -- Asks about Plan for tomorrow

-- Will email this evening

1645 EPA & ENE onsite

1705 Clean up, Secure site

1820 Apex/TH onsite

9/25/13 1m onsite  
overcast/showing

720 Arrive onsite

TH onsite, JS & Matt, Tailgate

735 ENE onsite

810 EPA onsite

880 Begin Confirmation Sampling, TCB onsite

835 REX-4 (34-40")

PID ~~by~~ background is 0.2 ppm

PID - 0.9 ppm, NS

Sand, brown (10%  $\frac{5}{16}$ ), loose med grain,  
partly graded, moist, w/silica 90% sand,  
10% fines

910 REX-5 (55-62")

PID = 0.3 ppm, NoScreen

-- Same material as REX-4

930 Call from JE regarding Sand bags

1000 Resume Confirmation Sampling

Trench depth: 31" to Top of concrete

Concrete 6" thick, ~~top~~ S. down 25"

1010 REX-6 (9-15") -- measured from

below bottom of concrete

Same material, some small clumps

of silt, PID: 0.1 ppm

1020 REX-7 (12-18") Trench 34" ~~to bottom~~ <sup>Top of concrete</sup>

-- 29" to bottom of concrete

PID = 1.5 ppm

Same sand material

Rite in the Rain

1050 REX-8 (18-24")

Trench - 45" to top of concrete

10"  $\pm$  bottom of concrete

PID = 1.1, No Screen

1100 REX-9 (22-28")

Total depth 55"

Bottom of concrete 49"

PID = 0.3 ppm, No Screen

Same Sand Material, occasional gravel

Very little silt.

1130 REX-10 (18-24")

- 45" depth, Top of concrete, 40" bottom of concrete

Same Sand.

1205 REX-11 (22-28")

2-inch Asphalt Concrete

- Total depth: 52" to top of asphalt concrete

PID = 0.0 ppm, No Screen

1230 Carl JF, Relay, morning, water

Reminded to field screen in repair area.

1310 Anne onsite

Field Screening.

PIDs 0.0-0.6, No Screen

Metal shavings on west side of eroded area

1350 Micah onsite

Tailgate

- JJ Identifying old wood debris w/

Creosote coating or oily tar

PID 1.0 to 2.7 ppm, No Screen

Surrounding Sand. PID = 2.3 ppm

1420 Hank onsite

1445 Hank onsite, JF onsite

~~Hank~~ wants Metal shavings out,

oily tar wood fragments.

Asks that JJ pull metal

debris out from upper end

of repair area to verify w/

weight needed

1515 EPA - ENE onsite

1520 JF - onsite

1530 TH & Apex onsite

31/92/13 1M on 5.7c

1015 Avenue Casside

55 onsite, memo, Ex in place

Removed metal found additional

- old square foot w/ pipe in top corner

74" x 15" x 15"

other items include remainings of

Car frame, metal paint cans,  
five fragments, misc. glass.

Top end of tank just below

surface, 3.5' from side of runway

Shed almost parallel to bank

21-21 Brew for lunch.

17.00 Bu: in ans, te.

1705 Beginn remittiert west. f. orange post.

continues west, broke section of concrete  
damp & found some under north

1245 June 20, 44

Handwritten: Held Screen darker Soil 6" West of

Crane Mount. TID 21.2 ppm. No deer

S. 1175 Sund, Burke brown w/ clog-jennies

Grid Screen in between Pad & Rectrory wall

PID = 15 mm, NS. 5.14 w/ Sand Gray the bottom

5/5/23

1300 Hank - like

*Rite in the Rain*

*(Handwritten notes and scribbles)*

SN  
L-012  
SN

Food  
Tame

328

1330 Discolored area adjacent South  
of Crane mound. PID = 2.0, slight  
broken shell

- follow localized around mounting area  
1350 MVB to WS0255. Mark 5' radius  
if removed 1' layer brown silty  
sand under 2"-3" gravel. Contains  
gravel, coarse to cobbles, carbonate  
debris. 80% fine sand, poorly sorted, off fine  
debris. Will return to Pad area of Charge  
buckets to smaller size

Field screen PID = 0.5 ppm, NS

- Some metal debris, brick fragments

1445 REX-12 (0-6")

- Silty sand ( ), brown (1042 7/3)  
S. moist, loose gravel, poorly sorted fine  
70% sand, 20% silt, 10% gravel. NS

1515 REX-13 (0-6") (1042 3/3)

- Some w/ silt ( ), d. Brown, moist +  
w/ gravel coarse to large cobbles. loose.

Field screen

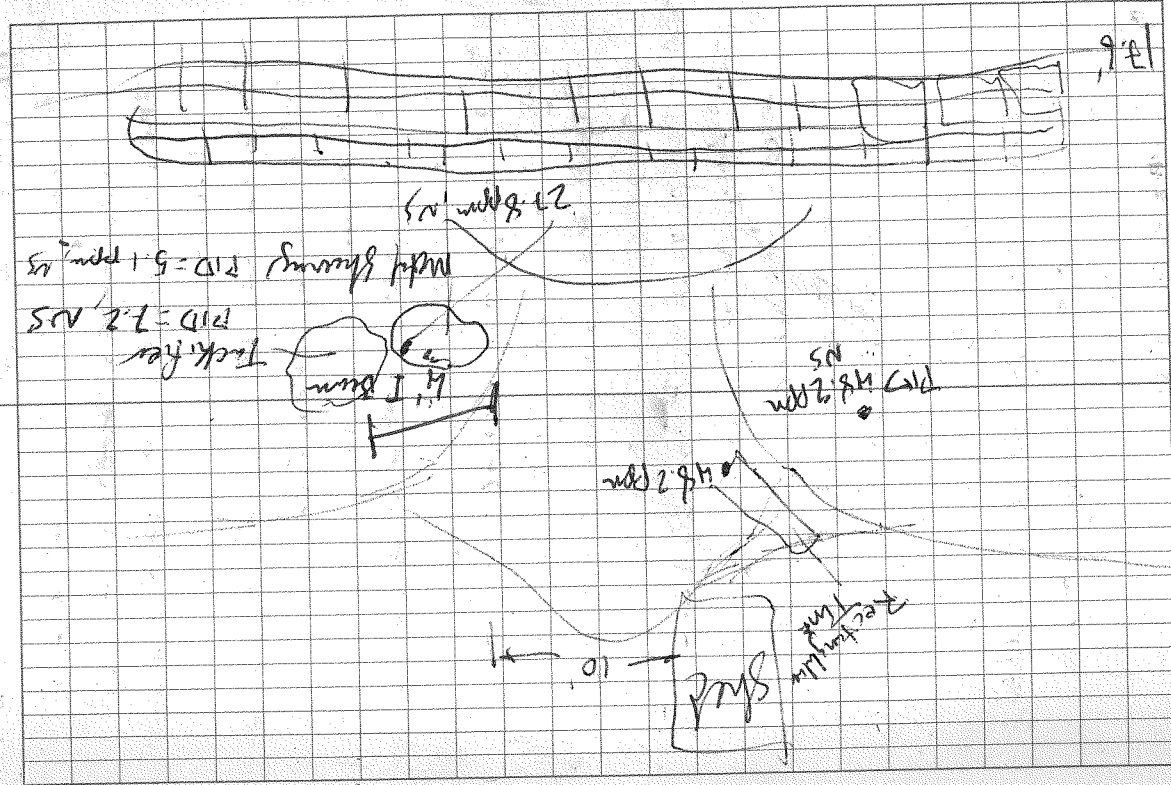
PID 0.8 NS

1515 J of B/A

1545 REX-14 (0-6")  
Gravelly sand ( ), d. brown, moist  
loose. 100% coarse sand, 30% gravel,  
10% fines

- Dup Collected  
1555 off site

- 9/27/13 101 on-site  
 700 Arrive on-site. Tailgate Review  
 Rick (Leases Shop) very upset!  
 that flagpole was removed & destroyed  
 in process w/o permission.  
 - Says he was not consulted explained  
 that harbor master (Ben) gave us  
 permission.  
 - Est. value 450+ as well as time and  
 effort to put in.  
 - Explained Sincere apologies, Als  
 upset w/ Time it's taking for  
 project & inconvenience of not using  
 area.  
 820 Call from DE. Explained Rick's  
 displeasure w/ flag pole  
 830 Collect GPS Locations for Confirmation  
 Sample locations, ~~150~~ from Ground  
 filtered area WSDSS, cont removed  
 in vicinity of Eganer Crane Pad.  
 850 Getting 710 readings field scanning  
 repair area, 30-50 ppm. No steel  
 930 TH begins placing bag, ask to kids  
 at 5 fill down 15th on-site  
 950 John & Stu on-site



Rite in the Rain

## Plan:

Place one or two of bags in temp Evason container.

- ~~Spec~~: Bring out west edge further

- Talked about P10 with, recap of resources Monday

- Minimum for trench fabric length-wise & weight down along surface & toe w/ bags.

1015 John & Steve offsite

1030 JJ: Sand Company able to deliver. JJ offsite to get fabric.

- Temp row of bags in place  
- 10:40 Attempt to contact Rick  
- Not in shop

1050 Call from JG. Game update. Doro  
Sara meet MCD Spec?

- Clean up site & bottom up

1110 JJ onsite. Yes, sand is dredge  
sand & meets MCD Spec. Sprud fabric

1130 JJ requests sand Proctor. Reply to JJ

1155 Rick onsite. Reply John's  
apology. Rick will ~~can~~ fix the  
situation

JJ spreading sand. Cal Portline  
is going to sand spec.

- ~~At 11:15~~ cleaning up metal, placing  
on plastic

1245 Second Cal Portland delivery

1340 JJ onsite

- Dig into tank, field scan,

1405 JJ offsite

1415 Probe around tank w/ shovel

~~surface~~ - ~~P~~ - Slight odor observed

Not petroleum, no staining observed.

Surface: 1.9 ppm, no sheen

6": 2.1 ppm, no sheen

12": 2.5 ppm, no sheen

18": 1.9 ppm, no sheen

adjacent to tank, to east.

P10 = 1.7 ppm

6" b3 = 2.3 ppm

12" b3 = 2.2 ppm

1435 Pot hilling along bank, mid bank

- Green sand. 2-3" under 2" topsoil

- Paint chips

- Flud Spec 10 ~~not~~ east of staining

- No gas, occasional pouring & leak

Return to the train

3' above west footing for

counter wts

- Black gr. + w/ <sup>reddish</sup> paint + flakes  
under 5" topsoil, subsoil

- mid pipe 4' above

2" topsoil, 4"-6" black

and gr. + paint flakes

- 8' above west footing down

No gr. + w/ paint flakes

- 6' west of corner of curbing, mid slope

- 4" green grit

- 1/2 way btwn log/pile & occasional fence

- Black coarse grit, paint flakes

1520 Begin Clean up

- Inspect Erosion Control. Appears

to be in order. No signs of

failure or channeling. BMPs in good condition

1545 Secure site. TH & Apex offsite

(Rain, 50)

1011 13 1M onsite

705 Arrive onsite 55 AM, Day

on site, west coast on site

w/ Safe Top drop box

much onsite

715 Tailgate

716 West coast offsite

Inspect site. Erosion

Control looks good.

Stack piles 717, 718 covered

French looks good

730 Begin looking TH Area

11 Nick Start @ bank Repair

Repaired slope to 11 Hatched

essentially all material was going

885 Andy onsite

835 Turn w/ JJ, Mob for removal

under concrete pour

- As much as 6" green blasting zone

under concrete

930 Finish ex, fill SF, will be onsite

to collect samples. Bank repair, meet

945 collect REX-15 (0-6) Plating Bay

gravelly sand ( ), brown coarse

look sand, large gravel -> Labzey

60% sand, 30% gravel, 10% silt

710 = 00 PM, No green

1605 Collect RAC-16(0-6)

- Repair Area Characterization
- med brown sand, no gravel, few s.w.c.

1020 Collect REX-16(0-6)

- cleared 6" slough prior to sampling. Sand w/ organics/muck
- PD = 0.0 from Dosteen

1030 Andy offsite

JF on site

- clearing area looks good

- Further Ex in lower

1040 Doug onsite

1100 Nick offsite

1105 JF offsite

1120 Doug offsite

- uncovered stumps

1130 Fill drop box w/ h2. stackpile

13rd box lined

1210 TH offsite for lunch (Mead, JJ)

1240 Onsite

1250 Hank onsite

1305 Doug onsite

1310 Hank offsite

Hank Report that Apex of T4 gone on days notes each day

- 1318 loading boxes of crane pad area excavation stumps w/ both excavators

- 1330 observe syring on sand surface of gravel filled trench

1430 Remove Clean out. Dig down hole only 12-18". Not connected to anything

1445 load pipe fragments. Doug offsite

Return to Repair area

1500 Mob last pallet of bags

1520 Finish placing bags. That are onsite

TH orders 1500 more bags

Begin Cleanup

1645 JF to shop, Micah home

TV SJ tonight: Results

Rate in the Rain

10/2/13 11M onsite overcast 50%

1020 Apex onsite TH onsite buckfilling

- Dory dropping off load of sand
- observe broken glass in parking area west of shop. Cherry

N3Q-891 (OR) w/ broken

window on drivers side

- TH buckfilling/compacting filter

area. Check in w/ JS. Pulled

back brake rod area this morn

ing Morning Small (~10' area

immediately west of crane pad

got partially filled in. TH

moved majority of rocks by hand

a long 5 ft fence.

- Observe that Point next to I-beam

post by Pipe Thence was knocked

down/filled in. Check w/ JS

about grit in area.

- Surface was peeled well yesterday

& grit went out w/ Contaminated

Steeples, lost load less than 1 yd

1110 Dory onsite w/ sand

- Grit removed was only a couple

inches ~ 6" back from face

1130 Dory site

1130-1200 Break for lunch

1200 Resume buckfilling

1200 Call JF. TH Compacting & buckfilling. Don't need to be onsite.

1220 Check in w/ JS. They are set.

Will likely be moving bags in

the afternoon.

1225 Envelope outside w/ bags.

Apex offsite

Rite in the Rain

10/3/13 1M onsite. overcast (40's)  
 700 arrive onsite JJ & Micah onset  
 - 30 minutes 1:40M to unload  
 bags yesterday  
 705 Carson testing onsite.  
 Review Spec.  
 95% dry density per ASTM T-99  
 Tailgate.  
 - Micah Compacting one last time w/  
 Plate Compactor  
 710 Tester offsite.  
 TB (Kevin) onsite  
 715 MOB down bags, begin working on  
 Repair area. Placing bags & haul  
 grading.  
 - Collect GPS of gnt removal extent  
 off of Concrete Pad.  
 730 Inspect Erosion Control Features.  
 Walk along dock  
~~1010 Apex offsite~~  
 1010 Concrete pad under 2" topsoil  
 adjacent to furnace shed  
 - looks to be there to stop erosion  
 - TH will leave as surface of tie  
 end in w/ bags to create path  
 over edge of wall

~~1025 Apex offsite~~

Rite in the Rain

Foggy (w/s)

10/14/13 IM onsite

655 IM onsite. JJ onsite

700 Micah onsite

Tailgate Safety review

740 Micah. offsite w/ concrete bar

830 JJ w/ Picking Concrete

debris from bank

805 Micah onsite. Tow truck

8915 Micah onsite. Load asphalt

concrete debris

940 Micah offsite w/ asphalt concrete

debris. JJ Staging metal debris,

cutting 4 1-inch post @ west end

1000 Andy onsite

JJ preparing Mini-17 ex to slings  
out from behind building

Cleaning re web offsite

1055 ~~1055~~ Begin small ex ~~at~~ west of building  
adjacent to building

1110 move metal pile land to access

bank area for excavation

1125 Micah offsite. JJ moving equip

1130 Begin Ex.

1140 Done Begin Sample Collection

REX-17(0-6)

Gravelly Sand w/ silt. Brown. Coarse, poorly  
graded Sand gravel up to cobbles.

Coarse Sand, 30% Gravel, 70% fine

1200 Callie P. A(-2(0-6))  
~~Sendy~~ <sup>Silt w/ sand</sup> ~~Silt~~ organics. D. Brown

Wed Plastic 60% silt, 30% sand

1205 JC onsite

1230 Andy offsite

TH problem

1300 JF offsite

Hydro Seed

Bank Sand Placement

Level lower area E. of Staging

Rocky area. Remove big rocks

Thin Topsoil

Grubbing &amp; Finish grading

Cut flag pole stem

Merge Curbing

1315 TH onsite

Discuss tasks

1330 metal removal &amp; loading

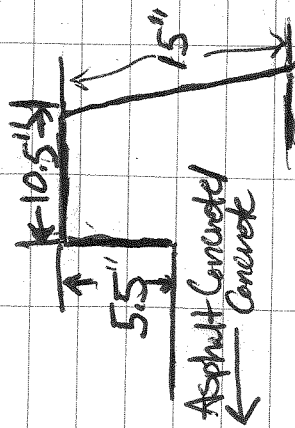
Cut flag pole stem, metal below this

1445 Metal away, general cleaning.

JJ checks on hydro seed

Rite in the Rain

Pad curbing - Pier 99



1500 Apex offsite

mostly Curb

10/7/13 IM onsite (5005)

740 Arrive onsite

JS & Doug onsite loading TH  
drop box w/ contaminated material  
from bank Ex on Friday  
Kevin (TJB) onsite grade taking  
& close grading

Tailgate Doug offsite

800 JS onsite-offsite for Jute

- Remind JS about Jute installation  
Spec Per manufacturer -

- JS filled EUT EX Excess fill sand  
& Excess soil after bank concrete removal

830 Micah onsite Tailgate -

840 JS onsite w/ Jute

- observe damaged section of  
erosion fence from pulling out  
concrete down

845 Micah & Kevin installing Jute on  
west side of building. Assist JT  
w/ gathering garbage.

945 Apex offsite

Rite in the Rain

10/8/13 1m onsite Showers (80's)

700 onsite Micah & Kevin onsite

- Shovs in place, blocks set.

- 1m gate

- 720 JJ onsite w/ supplies. Micah & Kevin

- Analytical? JJ onsite

- Gravel on asphalt in gravel filter area

- Drop box status

- Draining status

- Tank water

- Binsite

- Decan/10W

755 Dong onsite w/ Topsoil

810 Dong onsite - JJ spreading

Topsoil in filter area

820 Micah exists w/ spreading Topsoil

- Place 1 large scarp over sand

at the area west of EOT. Excavating

900 Micah Compacting Topsoil, JJ cleaning

w/

915 Dong onsite w/ gravel

925 Dong onsite Prep to put sand

next to curb

930 Hydroseed scheduled for Wednesday afternoon

Trapping down sand w/ 5x bucket.

950 Dong onsite w/ 7yd Topsoil

1010 Dong onsite

1015 JF & Milton Brown onsite

1100 JF onsite

1100 JJ onsite

1130 Inspect stairs. The bottom step &

the connection w/ the walkway

NEED work

1145 onsite

Reviews tasks w/ JJ

Rite in the Rain

10/9/13 on site P. Sunny (605)  
 1130 arrive onsite. TH (JL & M. Cook)  
 move waste drums & staging area  
 - Jute fullup installed.  
 - Asphalt concrete replace  
 - Curb backfill complete. Soil over  
 top edge of jute.  
 - Soil added to area adjacent to  
 furnace ~~sheds~~ shed.

1145 fix minor tenting issues ~~between~~

with debris on slope

1215 TH starts to remove asphalt  
 concrete debris.

1300 Hydroseeds onsite

Northwest Hydro-Mulches  
 at boring BL<sub>2</sub>

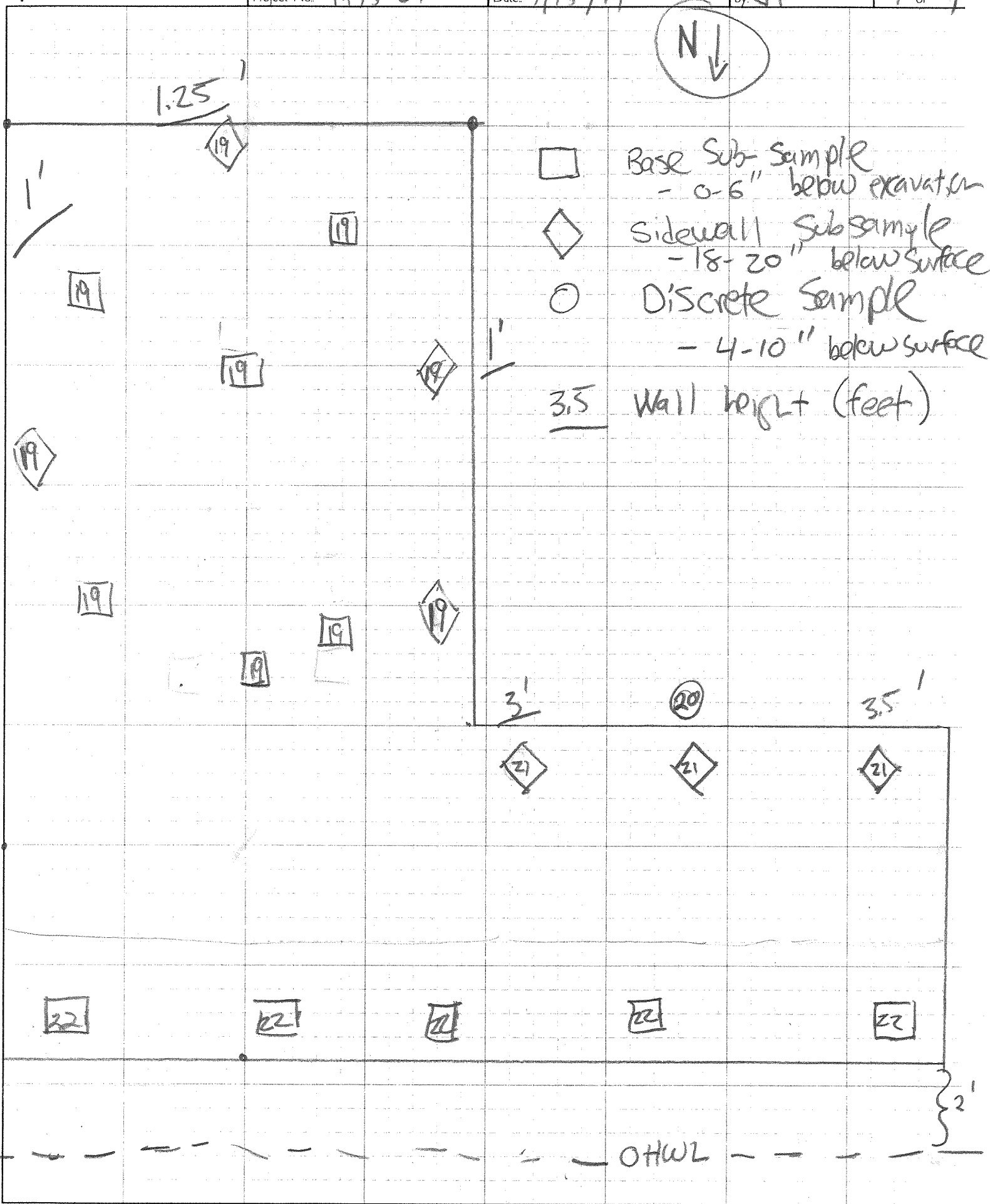
TH onsite

- Handle cars at

1400 Northwest Hydro mulch ~~at BL<sub>2</sub>~~

TH cleaning up.

1455 Apex onsite. TH final cleanup  
 & Equipment stage





3015 SW First Avenue  
Portland, Oregon 97201-4707  
(503) 924-4704 Phone  
(503) 943-6357 Fax

PROJECT NUMBER \_\_\_\_\_

FIELD REPORT NUMBER \_\_\_\_\_

PAGE \_\_\_\_\_

OF \_\_\_\_\_

DATE \_\_\_\_\_

PROJECT Pier 99

LOCATION \_\_\_\_\_

CLIENT \_\_\_\_\_

PURPOSE OF OBSERVATIONS \_\_\_\_\_

APEX REPRESENTATIVE Jm

CONTRACTOR \_\_\_\_\_

CONTRACTOR REP. \_\_\_\_\_

ARRIVAL TIME \_\_\_\_\_

DEPARTURE TIME \_\_\_\_\_

WEATHER Sunny

APEX PROJECT MANAGER Forwell

PERMIT NO. \_\_\_\_\_

H&S REVIEW yes

Our firm's professionals are represented on site solely to observe operations of the contractor identified, to form opinions about the adequacy of those operations, and to report those opinions to our client. The presence and activities of our field representative do not relieve any contractor from its obligation to meet contractual requirements. The contractor retains sole responsibility for site safety and the methods, operations, and sequence of construction. Unless signed by the Ash Creek Associates Project Manager, this report is preliminary. A preliminary report is provided solely as evidence that field observation was performed. Observations and/or conclusions and/or recommendations conveyed in the final report may vary from and shall take precedence over those included in a preliminary report.

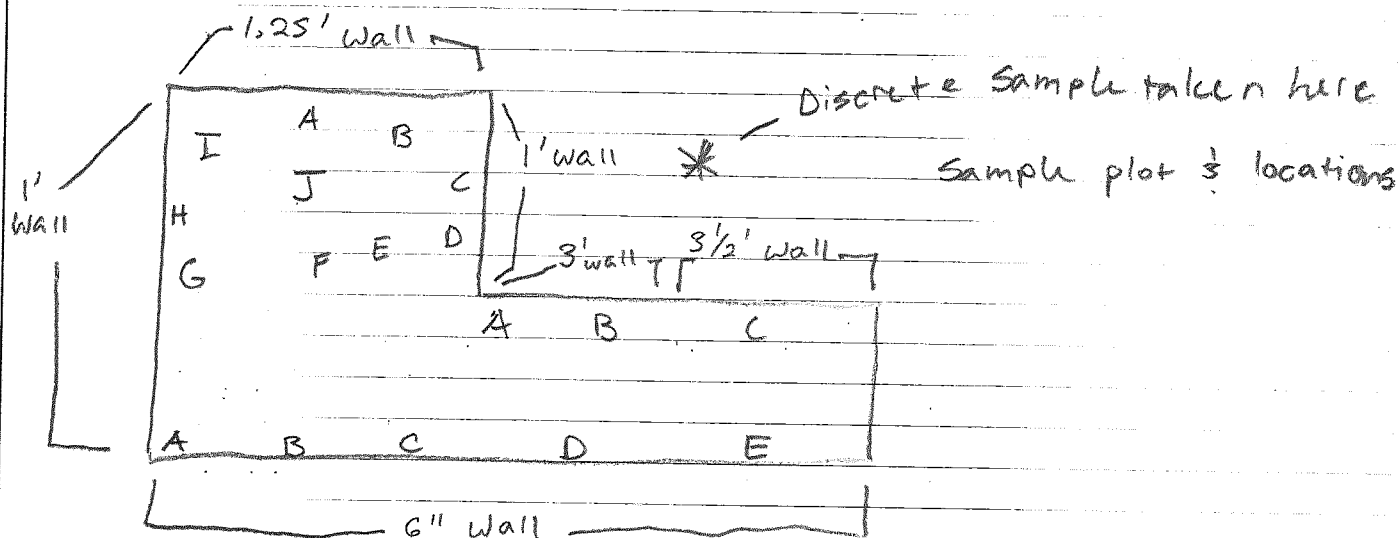
0640 Jm onsite

0700 Stratus onsite

0700 HASP Review/signing

0755 Jm completes sample labels

1000 Jm completes sampling all samples taken between 18"-20"



1120 Begin Backfilling and Biobag placement according to 1:1 Slope Schematic

Fill material being used is Dark compactible topsoil

1240 Backfill complete / grass seed laid down and fertilizer placed under growing net / net held down via stakes

BY \_\_\_\_\_

REVIEWED BY \_\_\_\_\_

APEX REPRESENTATIVE \_\_\_\_\_

APEX PROJECT MANAGER \_\_\_\_\_



3015 SW First Avenue  
Portland, Oregon 97201-4707  
(503) 924-4704 Phone  
(503) 943-6357 Fax

PROJECT NUMBER \_\_\_\_\_

FIELD REPORT NUMBER \_\_\_\_\_

PAGE

2

OF

2

DATE

7/2/14

1500

1400 - Fill other excavated area to the east  
1630 - Spread grass seed / lay down netting  
1700 - JM off site / stratus off site

### Distances:

Tree to top east corner = 9.7 ft

Tree to top west corner = 16.7 ft

Tree to lower far west corner = 28.4 ft

BY

REVIEWED BY

\_\_\_\_\_  
APEX REPRESENTATIVE

\_\_\_\_\_  
APEX PROJECT MANAGER

## ***Appendix D***

---

### **Disposal Documentation**

# Hillsboro Landfill, Inc.

3205 SE MINTER BRIDGE ROAD HILLSBORO, OR 97123

## PERMIT # 113908OR

Tracking Number 17272

### PERMIT TO DISPOSE OF NON-HAZARDOUS MATERIALS

This permit authorizes disposal of Customer's waste materials in accordance with the Industrial Waste & Disposal Services Agreement dated \_\_\_\_.

**EXPIRES: 9/10/2014**


**GENERATOR: MILTON BROWN**

<b>DESCRIPTION:PCS</b>	<b>TONS:200</b>
<input type="checkbox"/> SPECIAL WASTE <input checked="" type="checkbox"/> CS <input type="checkbox"/> C&D <input type="checkbox"/> CLEAN-UP	
<b>LOCATION: PORTLAND, OREGON</b> 1610 N. PIER 99 ST.	<b>COUNTY:Multnomah</b>
<b>CONTACT: JOHN FOXWELL</b> HANK STUKEY	<b>PHONE: 503-924-4707</b> 503-612-9200
	<b>FAX:</b> jfoxwell@apexcoss.com corporate@terrahydr.com

<b>BILLING:</b> Landfill account TERRA HYDR	<b>PO#:</b> 13-3020	<b>JOB#:</b> N/A
---	---------------------	------------------

*We accept business checks, cash, VISA / Mastercard or charge(with prior approval)*

<b>SPECIAL HANDLING : NONE:</b>	
MK	TyT

APPROVED: 	KRISTIN CASTNER	DATE: 09/10/13 2:13:10 PM
---	-----------------	---------------------------

**A COPY OF THIS PERMIT MUST BE SHOWN BY EACH DRIVER**

THERE IS A MINIMUM CHARGE OF \$50-\$60 FOR EACH LOAD OF SPECIAL WASTE



# WASTE MANAGEMENT



11130010 LANDFILL, INC  
3205 SE Minter Bridge  
Hillsboro, OR, 97123  
Ph: (503)-640-9427

Original  
Ticket# 1330599

Customer Name TERRA HYDR INC Carrier TERRA HYDR INC  
Ticket Date 10/01/2013 Vehicle# 25 Volume  
Payment Type Credit Account Container  
Manual Ticket# Driver  
Hauling Ticket# Check#  
Route Billing # 0002107  
State Waste Code Gen EPA ID N/A  
Manifest na  
Destination Grid  
PO 13-3020  
Profile 1139080R (SOIL~TERRA HYDR INC~BROWN MILTON~1139080R)  
Generator OR-MILTON O BROWN MILTON BROWN 1610 N PIER 99 ST

	Time	Scale	Operator	Inbound	Gross	
In	10/01/2013 15:30:05	Inbound_1	sdm		Tare	66560 lb*
Out	10/01/2013 15:30:05		sdm		Net	37320 lb*
			* Manual Weight		Tons	29240 lb
						14.62

Comments

Consumer Comments? We want to know. Please call.

Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1 Cont Soil Pet-RGC- 100		14.62	Tons				MULT-IN
2 13% FEA-13% FEA FE 100			%				MULT-IN

10/01/2013

Total Tax  
Total Ticket

\$491.32

Driver's Signature



Hillsboro Landfill, Inc  
3205 SE Minter Bridge  
Hillsboro, OR, 97123  
Ph: (503)-640-9427

Original  
Ticket# 1330563

Customer Name TERRAHYDRINC TERRA HYDR INC Carrier TERRA HYDR INC  
Ticket Date 10/01/2013 Vehicle# 25 Volume  
Payment Type Credit Account Container  
Manual Ticket# Driver doug  
Hauling Ticket# Check#  
Route Billing # 0002107  
State Waste Code Gen EPA ID N/A  
Manifest na  
Destination Grid  
PO 13-3020  
Profile 1139080R (SOIL~TERRA HYDR INC~BROWN MILTON~1139080R)  
Generator OR-MILTON O BROWN MILTON BROWN 1610 N PIER 99 ST

	Time	Scale	Operator	Inbound	Gross	
In	10/01/2013 12:05:21	Inbound 2	jdb		Tare	70200 lb*
Out	10/01/2013 12:05:21		jdb		Net	37380 lb*
			* Manual Weight		Tons	32820 lb

Comments

Consumer Comments? We want to know. Please call.

Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1 Cont Soil Pet-RGC- 100		16.41	Tons				MULT-IN
2 13% FEA-13% FEA FE 100			%				MULT-IN

Total Tax  
Total Ticket

\$551.47

Driver's Signature

*Don E. TAE*



3205 SE Minter Bridge  
Hillsboro, OR, 97123  
Ph: (503)-640-9427

Ticket# 1330536

Customer Name TERRAHYDRINC TERRA HYDR INC Carrier TERRA HYDR INC  
Ticket Date 10/01/2013 Vehicle# 25 Volume  
Payment Type Credit Account Container  
Manual Ticket# Driver doug  
Hauling Ticket# Check#  
Route Billing # 0002107  
State Waste Code Gen EPA ID N/A  
Manifest na  
Destination Grid  
PO 13-3020  
Profile 1139080R (SOIL~TERRA HYDR INC~BROWN MILTON~1139080R)  
Generator OR-MILTON O BROWN MILTON BROWN 1610 N PIER 99 ST

	Time	Scale	Operator	Inbound	Gross	75740 lb*
In	10/01/2013 09:13:50	Inbound_1	jdb		Tare	37440 lb*
Out	10/01/2013 09:13:50		jdb		Net	38300 lb
			* Manual Weight		Tons	19.15

Comments

Consumer Comments? We want to know. Please call.

Product	LDX	Qty	UOM	Rate	Tax	Amount	Origin
1 Cont Soil Pet-RGC- 100		19.15	Tons				MULT-IN
2 13% FEA-13% FEA FE 100			%				MULT-IN

*Doug T. Hill*

Total Tax  
Total Ticket

\$643.56

Driver's Signature



Hillsboro Landfill, Inc  
3205 SE Minter Bridge  
Hillsboro, OR, 97123  
Ph: (503)-640-9427

Original  
Ticket# 1330964

Customer Name TERRAHYDRINC TERRA HYDR INC Carrier TERRA HYDR INC  
Ticket Date 10/07/2013 Vehicle# 49 Volume  
Payment Type Credit Account Container  
Manual Ticket# Driver  
Hauling Ticket# Check#  
Route Billing # 0002107  
State Waste Code Gen EPA ID N/A  
Manifest na  
Destination Grid  
PO 13-3020  
Profile 1139080R (SOIL~TERRA HYDR INC~BROWN MILTON~1139080R)  
Generator OR-MILTON O BROWN MILTON BROWN 1610 N PIER 99 ST

	Time	Scale	Operator	Inbound	Gross	
In	10/07/2013 08:57:52	Inbound 2	ajm		Tare	27180 lb 17140 lb
Out	10/07/2013 09:12:59	Outbound	sdm		Net	10040 lb
					Tons	5.02

Comments

Consumer Comments? We want to know. Please call.

Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1 Cont Soil Pet-RGC- 100		5.02	Tons	29.74		\$149.29	MULT-IN
2 13% FEA-13% FEA FE 100			%	13.00		\$19.41	MULT-IN

Total Tax  
Total Ticket \$168.70

Driver's Signature

Hillsboro Landfill  
3205 SE MINTER BRIDGE RD,  
HILLSBORO, OR, 97123-5350  
Ph: (503) 640-9427

Reprint Ticket # 1330204

Customer Name	TERRAHYDRINC	Carrier	TERRA HYDR INC
Ticket Date	09/24/2013	Vehicle#	25 Volume
Payment Type	Credit Account	Container	
Manual Ticket#		Driver	
Hauling Ticket#		Check#	
Route		Billing#	0002107
StateWasteCode		Gen EPA ID	N/A
Manifest	na	Grid	
Destination			
PO#	13-3020		
Profile	113908OR(SOIL-TERRA HYDR INC~BROWN MILTON~113908OR)		
Generator	1578934 OR-MILTON O BROWN		

Time	Scale	Operator	Inbound	Gross	67500 lb*
In 09/24/13 03:16:47 PM	Inbound 1	sdm		Tare	37500 lb*
Out 09/24/13 03:16:47 PM		sdm		Net	30000 lb
		* Manual Weight		Tons	15

Comments 1330029

Products	LD%	Qty	UOM	Rate	Fee	Amount	Origin
Cont Soil Pet-RGC-Tons-Cont. Soil	100	15	Tons	29.74		\$446.10	MULT-IN
13% FEA-13% FEA FEE	100		%	13.00		\$57.99	MULT-IN

Driver's Signature _____	Total Fees
	Total Ticket \$504.09

Hillsboro Landfill  
3205 SE MINTER BRIDGE RD,  
HILLSBORO, OR, 97123-5350  
Ph: (503) 640-9427

Reprint Ticket # 1330203

Customer Name	TERRAHYDRINC	Carrier	WEST COAST MARINE WEST COAST MARINE
Ticket Date	09/19/2013	Vehicle#	123 Volume
Payment Type	Credit Account	Container	
Manual Ticket#		Driver	Keith
Hauling Ticket#		Check#	
Route		Billing#	0002107
StateWasteCode		Gen EPA ID	N/A
Manifest	na	Grid	
Destination			
PO#	13-3020		
Profile	113908OR(SOIL~TERRA HYDR INC~BROWN MILTON~113908OR)		
Generator	1578934 OR-MILTON O BROWN		

Time	Scale	Operator	Inbound	Gross	76220 lb*
In 09/19/13 03:13:17 PM	Inbound 1	sdm		Tare	40880 lb*
Out 09/19/13 03:13:17 PM		sdm		Net	35340 lb
		* Manual Weight		Tons	17.67

Comments 1329557

Products	LD%	Qty	UOM	Rate	Fee	Amount	Origin
Cont Soil Pet-RGC-Tons-Cont. Soil	100	17.67	Tons	29.74		\$525.51	MULT-IN
13% FEA-13% FEA FEE	100		%	13.00		\$68.32	MULT-IN

Driver's Signature	_____	Total Fees	
		Total Ticket	\$593.83

Hillsboro Landfill  
3205 SE MINTER BRIDGE RD,  
HILLSBORO, OR, 97123-5350  
Ph: (503) 640-9427

Reprint Ticket # 1330205

Customer Name	TERRAHYDRINC	Carrier	FILLIUPS DUMP TRUCK
Ticket Date	09/24/2013	Vehicle#	8 Volume
Payment Type	Credit Account	Container	
Manual Ticket#		Driver	Cameron
Hauling Ticket#		Check#	
Route		Billing#	0002107
StateWasteCode		Gen EPA ID	N/A
Manifest	na	Grid	
Destination			
PO#	13-3020		
Profile	113908OR(SOIL~TERRA HYDR INC~BROWN MILTON~113908OR)		
Generator	1578934 OR-MILTON O BROWN		

Time	Scale	Operator	Inbound	Gross	43680 lb*
In 09/24/13 03:19:11 PM	Inbound 1	sdm		Tare	30580 lb*
Out 09/24/13 03:19:11 PM		sdm		Net	13100 lb
		* Manual Weight		Tons	6.55

Comments 1330040

Products	LD%	Qty	UOM	Rate	Fee	Amount	Origin
Cont Soil Pet-RGC-Tons-Cont. Soil	100	6.55	Tons	29.74		\$194.80	MULT-IN
13% FEA-13% FEA FEE	100		%	13.00		\$25.32	MULT-IN

Driver's Signature \_\_\_\_\_

Total Fees  
Total Ticket \$220.12

Hillsboro Landfill  
3205 SE MINTER BRIDGE RD,  
HILLSBORO, OR, 97123-5350  
Ph: (503) 640-9427

Reprint Ticket # 1330206

Customer Name TERRAHYDRINC  
Ticket Date 09/24/2013  
Payment Type Credit Account  
Manual Ticket#  
Hauling Ticket#  
Route  
StateWasteCode  
Manifest na  
Destination  
PO# 13-3020  
Profile 113908OR(SOIL~TERRA HYDR INC~BROWN MILTON~113908OR)  
Generator 1578934 OR-MILTON O BROWN

Carrier WEST COAST MARINE WEST COAST  
MARINE  
Vehicle# 58 Volume  
Container  
Driver  
Check#  
Billing# 0002107  
Gen EPA ID N/A  
Grid

Time	Scale	Operator	Inbound	Gross	49380	lb*
In 09/24/13 03:20:42 PM	Inbound 1	sdm		Tare	29800	lb*
Out 09/24/13 03:20:42 PM		sdm		Net	19580	lb
		* Manual Weight		Tons	9.79	

Comments 1330044

Products	LD%	Qty	UOM	Rate	Fee	Amount	Origin
Cont Soil Pet-RGC-Tons-Cont. Soil	100	9.79	Tons	29.74		\$291.15	MULT-IN
13% FEA-13% FEA FEE	100		%	13.00		\$37.85	MULT-IN

Driver's Signature \_\_\_\_\_ Total Fees  
Total Ticket \$329.00

Hillsboro Landfill  
3205 SE MINTER BRIDGE RD,  
HILLSBORO, OR, 97123-5350  
Ph: (503) 640-9427

Reprint Ticket # 1330207

Customer Name	TERRAHYDRINC	Carrier	TERRA HYDR INC
Ticket Date	09/24/2013	Vehicle#	25 Volume
Payment Type	Credit Account	Container	
Manual Ticket#		Driver	Doug
Hauling Ticket#		Check#	
Route		Billing#	0002107
StateWasteCode		Gen EPA ID	N/A
Manifest	na	Grid	
Destination			
PO#	13-3020		
Profile	113908OR(SOIL~TERRA HYDR INC~BROWN MILTON~113908OR)		
Generator	1578934 OR-MILTON O BROWN		

Time	Scale	Operator	Inbound	Gross	67200 lb*
In 09/24/13 03:22:40 PM	Inbound 1	sdm		Tare	37440 lb*
Out 09/24/13 03:22:40 PM		sdm		Net	29760 lb
		* Manual Weight		Tons	14.88

Comments 1330070

Products	LD%	Qty	UOM	Rate	Fee	Amount	Origin
Cont Soil Pet-RGC-Tons-Cont. Soil	100	14.88	Tons	29.74		\$442.53	MULT-IN
13% FEA-13% FEA FEE	100		%	13.00		\$57.53	MULT-IN

Driver's Signature	_____	Total Fees	
		Total Ticket	\$500.06

Hillsboro Landfill  
3205 SE MINTER BRIDGE RD,  
HILLSBORO, OR, 97123-5350  
Ph: (503) 640-9427

Reprint Ticket # 1330208

Customer Name TERRAHYDRINC  
Ticket Date 09/24/2013  
Payment Type Credit Account  
Manual Ticket#  
Hauling Ticket#  
Route  
StateWasteCode  
Manifest na  
Destination  
PO# 13-3020  
Profile 113908OR(SOIL~TERRA HYDR INC~BROWN MILTON~113908OR)  
Generator 1578934 OR-MILTON O BROWN

Carrier FILLIUPS DUMP TRUCK  
Vehicle# 8 Volume  
Container  
Driver cameron  
Check#  
Billing# 0002107  
Gen EPA ID N/A  
Grid

Time	Scale	Operator	Inbound	Gross	48060	lb*
In 09/24/13 03:26:16 PM	Inbound 1	sdm		Tare	30580	lb*
Out 09/24/13 03:26:16 PM		sdm		Net	17480	lb
		* Manual Weight		Tons	8.74	

Comments 1330073

Products	LD%	Qty	UOM	Rate	Fee	Amount	Origin
Cont Soil Pet-RGC-Tons-Cont. Soil	100	8.74	Tons	29.74		\$259.93	MULT-IN
13% FEA-13% FEA FEE	100		%	13.00		\$33.79	MULT-IN

Driver's Signature \_\_\_\_\_

Total Fees  
Total Ticket \$293.72

Hillsboro Landfill  
3205 SE MINTER BRIDGE RD,  
HILLSBORO, OR, 97123-5350  
Ph: (503) 640-9427

Reprint Ticket # 1330211

Customer Name	TERRAHYDRINC	Carrier	TERRA HYDR INC
Ticket Date	09/24/2013	Vehicle#	25 Volume
Payment Type	Credit Account	Container	
Manual Ticket#		Driver	Doug
Hauling Ticket#		Check#	
Route		Billing#	0002107
StateWasteCode		Gen EPA ID	N/A
Manifest	na	Grid	
Destination			
PO#	13-3020		
Profile	113908OR(SOIL~TERRA HYDR INC~BROWN MILTON~113908OR)		
Generator	1578934 OR-MILTON O BROWN		

Time	Scale	Operator	Inbound	Gross	70520	lb*
In 09/24/13 03:31:13 PM	Inbound 1	sdm		Tare	37380	lb*
Out 09/24/13 03:31:13 PM		sdm		Net	33140	lb
		* Manual Weight		Tons	16.57	

Comments 1330097

Products	LD%	Qty	UOM	Rate	Fee	Amount	Origin
Cont Soil Pet-RGC-Tons-Cont. Soil	100	16.57	Tons	29.74		\$492.79	MULT-IN
13% FEA-13% FEA FEE	100		%	13.00		\$64.06	MULT-IN

Driver's Signature _____	Total Fees
	Total Ticket \$556.85

Hillsboro Landfill  
3205 SE MINTER BRIDGE RD,  
HILLSBORO, OR, 97123-5350  
Ph: (503) 640-9427

Reprint Ticket # 1330209

Customer Name TERRAHYDRINC

Ticket Date 09/24/2013

Payment Type Credit Account

Manual Ticket#

Hauling Ticket#

Route

StateWasteCode

Manifest na

Destination

PO# 13-3020

Profile 113908OR(SOIL~TERRA HYDR INC~BROWN MILTON~113908OR)

Generator 1578934 OR-MILTON O BROWN

Carrier WEST COAST MARINE WEST COAST  
MARINE

Vehicle# 53 Volume

Container

Driver

Check#

Billing# 0002107

Gen EPA ID N/A

Grid

	Time	Scale	Operator	Inbound	Gross	53880	lb*
In	09/24/13 03:29:32 PM	Inbound 1	sdm		Tare	29800	lb*
Out	09/24/13 03:29:32 PM		sdm		Net	24080	lb
			* Manual Weight		Tons	12.04	

Comments 1330078

Products	LD%	Qty	UOM	Rate	Fee	Amount	Origin
Cont Soil Pet-RGC-Tons-Cont. Soil	100	12.04	Tons	29.74		\$358.07	MULT-IN
13% FEA-13% FEA FEE	100		%	13.00		\$46.55	MULT-IN

Driver's Signature \_\_\_\_\_

Total Fees  
Total Ticket \$404.62

Hillsboro Landfill  
3205 SE MINTER BRIDGE RD,  
HILLSBORO, OR, 97123-5350  
Ph: (503) 640-9427

Reprint Ticket # 1330212

Customer Name	TERRAHYDRINC	Carrier	FILLIUPS DUMP TRUCK
Ticket Date	09/24/2013	Vehicle#	8 Volume
Payment Type	Credit Account	Container	
Manual Ticket#		Driver	Cameron
Hauling Ticket#		Check#	
Route		Billing#	0002107
StateWasteCode		Gen EPA ID	N/A
Manifest	na	Grid	
Destination			
PO#	13-3020		
Profile	113908OR(SOIL~TERRA HYDR INC~BROWN MILTON~113908OR)		
Generator	1578934 OR-MILTON O BROWN		

Time	Scale	Operator	Inbound	Gross	50480	lb*
In 09/24/13 03:33:26 PM	Inbound 1	sdm		Tare	30580	lb*
Out 09/24/13 03:33:26 PM		sdm		Net	19900	lb
		* Manual Weight		Tons	9.95	

Comments 1330108

Products	LD%	Qty	UOM	Rate	Fee	Amount	Origin
Cont Soil Pet-RGC-Tons-Cont. Soil	100	9.95	Tons	29.74		\$295.91	MULT-IN
13% FEA-13% FEA FEE	100		%	13.00		\$38.47	MULT-IN

Driver's Signature _____	Total Fees
	Total Ticket \$334.38

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
		ORQ000032499	1	(800) 424-9300	001138564 JJK
5. Generator's Name and Mailing Address		Generator's Site Address (if different than mailing address)			
MILTON O. BROWN 8320 NE HWY 99 VANCOUVER, WA. 98665		MILTON BROWN 1610 NORTH PIER 99 STREET PORTLAND, OR. 97217			
Generator's Phone:		(503) 720-6590			
6. Transporter 1 Company Name		U.S. EPA ID Number			
WEST COAST MARINE CLEANING, INC.		WAD988479440			
7. Transporter 2 Company Name		U.S. EPA ID Number			
8. Designated Facility Name and Site Address		U.S. EPA ID Number			
CWMNW, INC. 17629 CEDAR SPRINGS LANE ARLINGTON, OR. 97812-9709		11/13/13 89452353			
Facility's Phone:		(541) 454-2643			
9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	Type	12. Unit Wt./Vol.	13. Waste Codes
X	1. RQ, NA3077, HAZARDOUS WASTE, SOLID, N.O.S., 9, III, (LEAD)	001	CM	3060 12250	D008
	2.				
	3.				
	4.				
14. Special Handling Instructions and Additional Information					
1. OR323447: STAB07-BURND DEBRIS; ERG# 171; (RQ=10LBS) 3060 p					
DROPBOX# 349-13 Chemtrec# CCN24117					
15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.					
Generator's/Offoror's Printed/Typed Name		Signature		Month	Day Year
Kathy Harrison for Milton O Brown		Kathy Harrison		11	13/13
16. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry/exit: Date leaving U.S.:					
17. Transporter Acknowledgment of Receipt of Materials					
Transporter 1 Printed/Typed Name		Signature		Month	Day Year
David J Morley		David J Morley		11	13/13
Transporter 2 Printed/Typed Name		Signature		Month	Day Year
18. Discrepancy					
18a. Discrepancy Indication Space <input checked="" type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection					
weight changed by driver 11/13/13					
Manifest Reference Number:					
18b. Alternate Facility (or Generator) U.S. EPA ID Number					
Facility's Phone:					
18c. Signature of Alternate Facility (or Generator) Month Day Year					
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)					
1. H132		2.		3.	
				4.	
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a					
Printed/Typed Name		Signature		Month	Day Year
Bobbi Galvin		Bobbi Galvin		11	13/13



**Chemical Waste Management  
Of The Northwest**

17629 Cedar Springs Lane  
Arlington, Oregon 97812  
541-454-2643

EPA I.D.# ORDO89452353

LOAD NO. \_\_\_\_\_

MANIFEST DOC. NO. \_\_\_\_\_

INBOUND

T/D: 13:01:52 2013-11-13  
ID: 430721 TRK ID: 3161  
34660 lb G

OUTBOUND

T/D: 13:28:42 2013-11-13  
ID: 430721 TRK ID: 3161  
34660 lb G  
31600 lb PT  
3060 lb N

NET 1.53 TONS

GENERATOR \_\_\_\_\_



# Waste Management Profile

Requested Facility: Hillsboro

☐ Check if there are multiple generator locations. Attach locations.

☐ Unsure Profile Number: \_\_\_\_\_

☐ Renewal? Original Profile Number: \_\_\_\_\_

## A. GENERATOR INFORMATION (MATERIAL ORIGIN)

- Generator Name: Milton Brown
- Site Address: 1610 North Pier 99 Street  
(City, State, ZIP) Portland, Oregon 97217
- County: Multnomah
- Contact Name: John Foxwell
- Email: jfoxwell@apexcos.com
- Phone: 503 924-4704 ext 113 7. Fax: \_\_\_\_\_
- Generator EPA ID: \_\_\_\_\_ ☒ N/A
- State ID: \_\_\_\_\_ ☒ N/A

## C. MATERIAL INFORMATION

- Common Name: Soil  
Describe Process Generating Material: ☐ See Attached  

Soil from EPA required cleanup at former ship repair facility.
- Material Composition and Contaminants: ☐ See Attached

1. Copper, lead, zinc, and other metals	<1%
2. PCBs and organochlorine pesticides	<1%
3. TBT	<1%
4. Soil	~99%
	≥100%
- State Waste Codes: \_\_\_\_\_ ☒ N/A
- Color: Grey and brown
- Physical State at 70°F: ☒ Solid ☐ Liquid ☐ Other: \_\_\_\_\_
- Free Liquid Range Percentage: \_\_\_\_\_ to \_\_\_\_\_ ☒ N/A (Solid)
- pH: \_\_\_\_\_ to \_\_\_\_\_ ☒ N/A (Solid)
- Strong Odor: ☐ Yes ☒ No Describe: \_\_\_\_\_
- Flash Point: ☐ <140°F ☐ 140°–199°F ☐ ≥200° ☒ N/A (Solid)

## E. ANALYTICAL AND OTHER REPRESENTATIVE INFORMATION

- Analytical attached ☒ Yes  
Please identify applicable samples and/or lab reports:  

See Table 1 through Table 5, and attached lab reports.  
TCLP results of representative waste sample in Apex Labs Report No. A310036
- Other information attached (such as MSDS)? ☐ Yes

## G. GENERATOR CERTIFICATION (PLEASE READ AND CERTIFY BY SIGNATURE)

By signing this Waste Management Profile, I hereby certify that all information submitted in this and all attached documents contain true and accurate descriptions of this material, and that all relevant information necessary for proper material characterization and to identify known and suspected hazards has been provided. Any analytical data attached was derived from a sample that is representative as defined in 40 CFR 261 – Appendix 1 or by using an equivalent method. All changes occurring in the character of the material (i.e., changes in the process or new analytical) will be identified by the Generator and be disclosed to Waste Management prior to providing the material to Waste Management.

If I am an agent signing on behalf of the Generator, I have confirmed with the Generator that information contained in this Profile is accurate and complete.

Name (Print): MELTON BROWN Date: June 26, 2014

Title: OWNER

Company: \_\_\_\_\_

## B. BILLING INFORMATION

☐ SAME AS GENERATOR

- Billing Name: Stratus Corporation
- Billing Address: 39515 SW Hartley Road  
(City, State, ZIP) Gaston, Oregon 97119
- Contact Name: Scott Flaherty
- Email: s.flaherty@stratuscorp.net
- Phone: 503 985 7912 6. Fax: \_\_\_\_\_
- WM Hauled? ☐ Yes ☒ No
- P.O. Number: TBD

## D. REGULATORY INFORMATION

- EPA Hazardous Waste? ☐ Yes\* ☒ No  
Code: \_\_\_\_\_
  - State Hazardous Waste? ☐ Yes ☒ No  
Code: \_\_\_\_\_
  - Excluded waste under 40 CFR 261.4 (a) or (b)? ☐ Yes\* ☒ No
  - Contains Underlying Hazardous Constituents? ☐ Yes\* ☒ No
  - Contains benzene and subject to Benzene NESHAP? ☐ Yes\* ☒ No
  - Facility remediation subject to 40 CFR 63 GGGGG? ☐ Yes\* ☒ No
  - CERCLA or State-mandated clean-up? ☒ Yes\* ☐ No
  - NRC or State-regulated radioactive or NORM waste? ☐ Yes\* ☒ No
- \*If Yes, see Addendum (page 2) for additional questions and space.
- Contains PCBs? → If Yes, answer a, b and c. ☒ Yes ☐ No
    - Regulated by 40 CFR 761? ☐ Yes ☒ No
    - Remediation under 40 CFR 761.61 (a)? ☐ Yes ☒ No
    - Were PCB imported into the US? ☐ Yes ☒ No
  - Regulated and/or Untreated Medical/Infectious Waste? ☐ Yes ☒ No
  - Contains Asbestos? ☐ Yes: Friable ☐ Yes: Non-Friable ☒ No

## F. SHIPPING AND DOT INFORMATION

- ☒ One-Time Event ☐ Repeat Event/Ongoing Business
- Estimated Quantity/Unit of Measure: 200  
☒ Tons ☐ Yards ☐ Drums ☐ Gallons ☐ Other: \_\_\_\_\_
- Container Type and Size: Truck and Trailer
- USDOT Proper Shipping Name: \_\_\_\_\_ ☒ N/A

Certification Signature

THINK GREEN®

QUESTIONS? CALL 800 963 4776 FOR ASSISTANCE

Last Revised March 20, 2012  
©2011 Waste Management, Inc.



**Only complete this Addendum if prompted by responses on Waste Management Profile (page 1) or to provide additional information. Sections and question numbers correspond to Waste Management Profile.**

Profile Number: \_\_\_\_\_

## SECTION C

Describe Process Generating Material (Continued from page 1):

If more space is needed, please attach additional pages.

Material Composition and Contaminants (Continued from page 1):

If more space is needed, please attach additional pages.

5.	
6.	
7.	
8.	
9.	
10.	
	≥100%

## SECTION D

**Only questions with a "Yes" response on Waste Management Profile (page 1) need to be answered here.**

1. EPA Hazardous Waste

a. Please list all USEPA listed and characteristic waste code numbers:

b. Is the material subject to the Alternative Debris standards (40 CFR 268.45)?

☐ Yes ☐ No

c. Is the material subject to the Alternative Soil standards (40 CFR 268.49)? → If Yes, complete question 4.

☐ Yes ☐ No

d. Is the material exempt from Subpart CC Controls (40 CFR 264.1083 and 265.1084)?

☐ Yes ☐ No

→ If Yes, please select one of the following:

☐ Waste has been determined to be LDR exempt [265.1083(c)(4) and 265.1084(c)(4)] based on the fact that it meets all applicable organic treatment standards (including UHCs for D-coded characteristic wastes) or a Specified Technology has been utilized.

☐ Waste does not qualify for a LDR exemption, but the average VOC at the point of origination is <500 ppmw and this determination was based on analytical testing (upload copy of analysis) or generator knowledge.

2. State Hazardous Waste → Please list all state waste codes: \_\_\_\_\_

3. Excluded Waste → Please select which of the following categories apply to your material:

☐ Delisted Hazardous Waste

☐ Excluded Waste under 40 CFR 261.4 → Specify Exclusion: \_\_\_\_\_

☐ Treated Hazardous Waste Debris

☐ Treated Characteristic Hazardous Waste → If checked, complete question 4.

4. Underlying Hazardous Constituents → Please list all Underlying Hazardous Constituents:

5. Benzene NESHAP → Please include benzene concentration and percent water/moisture in chemical composition.

a. Are you a TSDF? → If yes, please complete Benzene NESHAP questionnaire. If not, continue.

b. What is your facility's current total annual benzene quantity in Megagrams?

☐ <1 Mg ☐ 1–9.99 Mg ☐ ≥10 Mg

c. Is this waste soil from remediation at a closed facility?

☐ Yes ☐ No

d. Has material been treated to remove 99% of the benzene or to achieve <10 ppmw?

☐ Yes ☐ No

e. Is material exempt from controls in accordance with 40 CFR 61.342?

☐ Yes ☐ No

→ If yes, specify exemption: \_\_\_\_\_

f. Based on your knowledge of your waste and the BWON regulations, do you believe that this waste stream is subject to treatment and control requirements at an off-site TSDF?

☐ Yes ☐ No

6. 40 CFR 63 GGGGG → Does the material contain <500 ppw VOHAPs at the point of determination?

☐ Yes ☐ No

7. CERCLA or State-Mandated clean up → Please submit the Record of Decision or other documentation to assist others in the evaluation for proper disposal.

8. NRC or state regulated radioactive or NORM Waste → Please identify Isotopes and pCi/g: \_\_\_\_\_



# Non-Hazardous WAM Approval

Requested Management Facility: **Hillsboro Landfill**

Profile Number: **115796OR**

Waste Approval Expiration Date: **06/30/2015**

## APPROVAL DETAILS

Approval Decision: ☒ Approved ☐ Not Approved

Profile Renewal: ☐ Yes ☒ No

Management Method: **Alternate Daily Cover (ADC)**

Generator Name: **Milton O Brown**

Management Facility Precautions, Special Handling Procedures or Limitation on approval:

- Shall not contain free liquid
- Approval Number must accompany each shipment
- Shall not pose a dust nuisance
- Shall not pose a odor nuisance
- Analysis provided shall be representative of all material shipped under this non-hazardous waste profile
- Shall comply with applicable DOT and OSHA labeling, packaging and manifesting requirements
- Shall notify WM disposal location of changes associated with original waste generating process prior to shipment

Additional Conditions:

WM Authorization Name: **Kristin Castner**

Title: **Waste Approval Manager**

WM Authorization Signature: 

Date: **06/30/2014**

Agency Authorization (if Required):

Date:

GENERATOR

INT'L

TRANSPORTER

DESIGNATED FACILITY

NON-HAZARDOUS  
WASTE MANIFEST

1. Generator ID Number

2. Page 1 of

001

3. Emergency Response Phone

4. Waste Tracking Number

ORR-29110

5. Generator's Name and Mailing Address

Generator's Site Address (if different than mailing address)

Generator's Phone:

6. Transporter 1 Company Name

U.S. EPA ID Number

7. Transporter 2 Company Name

U.S. EPA ID Number

8. Designated Facility Name and Site Address

U.S. EPA ID Number

Facility's Phone:

9. Waste Shipping Name and Description

10. Containers

No.

Type

11. Total  
Quantity12. Unit  
Wt./Vol.

1. ALTERNATE DAILY COVER (ADC)

001

CM

10

Y

2.

3.

4.

13. Special Handling Instructions and Additional Information

MATERIAL REMOVED FROM STRATUS CORP JOB SITE

PROFILE # 11579601

Box 318-10

TICKET # 1351467

WT 16620

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Officer's Printed/Typed Name

Signature

Month Day Year

15. International Shipments

☐ Import to U.S.☐ Export from U.S.

Port of entry/exit:

Date leaving U.S.:

Transporter Signature (for exports only):

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name

Signature

Month Day Year

Transporter 2 Printed/Typed Name

Signature

Month Day Year

17. Discrepancy

17a. Discrepancy Indication Space

☐ Quantity☐ Type☐ Residue☐ Partial Rejection☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator)

U.S. EPA ID Number

Facility's Phone:

17c. Signature of Alternate Facility (or Generator)

Month Day Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name

Signature

Month Day Year

3205 SE Minter Bridge  
Hillsboro, OR, 97123  
Ph: (503)-640-9427

ONR 29110

Ticket# 1351467

Box 318-10

## WASTE MANAGEMENT

WASTE MANAGEMENT		Carrier	WEST COAST MARINE	WEST COAST MARINE
Customer Name	STRATUSCORP STRATUS CORPORATI	Vehicle#	161	Volume
Ticket Date	07/10/2014	Container		
Payment Type	Credit Account	Driver	stan	
Manual Ticket#		Check#		
Hauling Ticket#		Billing #	0000371	
Route		Gen EPA ID		
State Waste Code		Grid		
Manifest	na			
Destination				
PO	none			
Profile	1157960R (SOIL~STRATUS CORP~BROWN MILTON~1157960R)			
Generator	QR-BROWN MILTON BROWN MILTON 1610 NORTH PIER 99 ST			

	Time	Scale	Operator	Inbound	Gross	48760 lb
In	07/10/2014 12:13:19	Inbound 2	jdb		Tare	32140 lb
Out	07/10/2014 12:35:24	Outbound	sdm		Net	16620 lb
					Tons	8.31

Comments

Consumer Comments? We want to know. Please call.

Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1 Cont Soil Pet-RGC-	100	8.31	Tons				MULT-IN
2 17.5% FEA-17.5% FE	100		%				MULT-IN

Total Tax  
Total Ticket

Driver's Signature

Fax: 503-282-3253

**Bill To:**  
TERRA51  
Terra Hydr Inc  
PO Box 3616  
Portland, OR 97208

<b>Date</b>	<b>Invoice #</b>
October 7, 2013	35926

**Daily Tickets from 10-01-13 through 10-05-13**

503. 612 - 9220 Fax

[illegible]

## Customer Delivery Registry

Date: 10/10/13 Time: 9:56:11AM

Report Date: 10-01/2013 00:00 to 10/05/2013 23:59:59

Plant: Porter W. Yett

						Loads	Amount (Tn)
Customer Id - Name							
TERRA51 - TERRA HYDR INC						3	3.00
Job Id - Name							
DUMP - DUMP						3	3.00
Phase Id - Name							
PO14 - 3020						3	3.00
Product Id - Name							
A2 - Dump Truck or Trailer (3-12 yards)						1	1.00
Date Time Ticket # Carrier Id - Name Truck Id - Description							
10/4/13 9:53 am 1148958 TERRA01- TERRA HYDR INC TERRAHYDR49 - 49							1.00
Product Id - Name							
C2 - Dump Truck or Trailer (3-12 yards)						2	2.00
Date Time Ticket # Carrier Id - Name Truck Id - Description							
10/4/13 7:52 am 1148931 TERRA01- TERRA HYDR INC TERRAHYDR49 - 49							1.00
10/4/13 9:02 am 1148948 TERRA01- TERRA HYDR INC TERRAHYDR49 - 49							1.00

Ticket #: 1148931

Date: 10/04/13

Time: 07:52 AM

\*\*\* POINT OF SALE \*\*\*

**CUSTOMER INFORMATION**

**JOB INFORMATION**

ID: TERRA51  
Name: TERRA HYDR INC  
Address: PO Box 3616, 11670 SW Waldo  
Portland, OR 97208  
Phone: 503-625-4000

ID: DUMP  
Name: DUMP  
Address:  
Phone:

**Truck and Carrier Information**

Truck ID: TERRAHYDR4  
Descript: 49  
Carrier ID: TERRA01  
Name: TERRA HYDR INC  
Driver:

Quantity: 1 Cement Dump Ld

**PRODUCT AND LOAD TOTALS**

ID: C2	1/TODAY	1/TO DATE
Name: Dump Truck or Traile	1.00	1.00

Leighmaster:

Porter W. Yett

5949 NE CULLY BLVD.

Portland, OR 97218

Received By:

Phone: 503-282-3251

Fax: 503-282-3253

Ticket #: 1148948

Date: 10/04/13

Time: 09:02 AM

\*\*\* POINT OF SALE \*\*\*

**CUSTOMER INFORMATION**

ID: TERRA51  
Name: TERRA HYDR INC  
Address: PO Box 3616, 11670 SW Waldo  
Portland, OR 97208  
Phone: 503-625-4000

**JOB INFORMATION**

ID: DUMP  
Name: DUMP  
Address:  
Phone:

**Truck and Carrier Information**

Truck ID: TERRAHYDR4  
Descript: 49  
Carrier ID: TERRA01  
Name: TERRA HYDR INC  
Driver:

Quantity: 1 Cement Dump Ld

**PRODUCT AND LOAD TOTALS**

ID: C2	2/TODAY	2/TO DATE
Name: Dump Truck or Traile	2.00	2.00

Weighmaster:

Received By:

Porter W. Yett

Phone: 503-282-3251

5949 NE CULLY BLVD.

Fax: 503-282-3253

Portland, OR 97218

Ticket #: 1148958

Date: 10/04/13

Time: 09:53 AM

\*\*\* POINT OF SALE \*\*\*

**CUSTOMER INFORMATION**

ID: TERRA51  
Name: TERRA HYDR INC  
Address: PO Box 3616, 11670 SW Waldo  
Portland, OR 97208  
Phone: 503-625-4000

**JOB INFORMATION**

ID: DUMP  
Name: DUMP  
Address:  
Phone:

**Truck and Carrier Information**

Truck ID: TERRAHYDR4  
Descript: 49  
Carrier ID: TERRA01  
Name: TERRA HYDR INC  
Driver:

Quantity: 1 Asphalt Dump Ld

**PRODUCT AND LOAD TOTALS**

ID: A2	1/TODAY	1/TO DATE
Name: Dump Truck or Traile	1.00	1.00

Weighmaster:

Received By:

Porter W. Yett

Phone: 503-282-3251

5949 NE CULLY BLVD.

Fax: 503-282-3253

Portland, OR 97218



**METRO METALS NORTHWEST, INC.**  
5611 N.E. Columbia Blvd.  
Portland, Oregon 97218  
(503) 287-8861



**2311483**

24-201/1230  
2311483

PAY TO THE  
ORDER OF

**TERRA HYDR**

Oct. 04, 2013

\$ **\*\*\*365.36**

**\*\*\*365 Dollars and 36 Cents** DOLLARS

**TERRA HYDR  
P.O BOX 3616  
PORTLAND, OR 97206**

TWO SIGNATURES REQUIRED OVER \$2,000 DOLLARS

*[Signature]*  
AUTHORIZED SIGNATURE

ORIGINAL CHECK IS PRINTED ON CHEMICAL REACTIVE PAPER WHICH CONTAINS A WATERMARK AUTHORIZED SIGNATURE

⑈ 2311483 ⑈ ⑆ 123002011 ⑆ 379681045132 ⑈

**METRO METALS NORTHWEST, INC.: FERROUS**

Date: 10/04/2013

Vendor: 16032 TERRA HYDR

2311483  
Ticket#: 736125

**2311483**

Paid To: TERRA HYDR

Total Wt: 4,090

Descrip:

Truck#

Notes:

Tot. Paid: \$365.36

Commodity  
#2 Steel Unprepared  
#1 & #2 Steel Unprepared

Gross Tare Tare2 Contam  
19,380 17,200 50 DRT  
19,940 17,980

Net UM Price  
2,180 N 188.00  
1,910 N 168.00

Total  
204.92  
160.44



Tualatin Valley Waste Recovery, Inc.  
3205 SE Minter Bridge  
Hillsboro, OR, 97123  
Ph: (503) 640-9427

Original  
Ticket# 1171235

Customer Name TERRAHYDRINC TERRA HYDR INC  
Ticket Date 10/07/2013  
Payment Type Credit Account  
Manual Ticket#  
Hauling Ticket#  
Route  
State Waste Code  
Manifest  
Destination  
PO 3020 pier 99  
Profile ()  
Generator

Carrier TERRA HYDR  
Vehicle# 49  
Container  
Driver  
Check#  
Billing # 0001947  
Gen EPA ID  
Grid

Volume

	Time	Scale	Operator	Inbound	Gross	
In	10/07/2013 11:53:43	Inbound 1	sdm		Tare	19040 lb*
Out	10/07/2013 11:53:58	Inbound 1	sdm		Net	17040 lb*
			* Manual Weight		Tons	2000 lb
						1.00

Comments

Consumer Comments? We want to know! Please call.

Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1 CDT-C & D Metro on 100		1.00	Tons	84.00		\$84.00	WASHIN
2 TRAWO-Tires without 0		1	Each	6.50		\$6.50	WASHIN
3 TKTRAR-Truck Tire 0		1	Each	17.00		\$17.00	WASHIN
4 EVF-S-Standard Env 100		1	Load	7.00		\$7.00	

Total Tax  
Total Ticket \$114.50

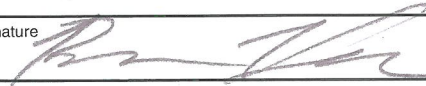

Driver's Signature



UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number	
		ORQ000032499	1	800-483-3718	006738237 FLE	
5. Generator's Name and Mailing Address		Generator's Site Address (if different than mailing address)				
Milton O. Brown 1619 N. Pier St Portland, OR 97217		SAME				
Generator's Phone:		(503) 224-3206 / Mr. Jeremy Kemp				
6. Transporter 1 Company Name		U.S. EPA ID Number				
WasteXpress		ORQ 000033150				
7. Transporter 2 Company Name		U.S. EPA ID Number				
8. Designated Facility Name and Site Address		U.S. EPA ID Number				
Clean Harbors - Aragonite LLC 11600 N. Aptos Rd. Aragonite, CO 81029		UTD 991550177				
Facility's Phone:		435-784-8100				
9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
		No.	Type			
X	1. UN3082, Waste Environmentally Hazardous Substances, Liquid, N.O.S. (Lead), 9, PG III	1	DM	45	G	3008
	2.					
	3.					
	4.					
14. Special Handling Instructions and Additional Information						
Profile # CH759963, 1/55 G. DM, ERG#171						
Job# 19145						
15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.						
Generator's/Offor's Printed/Typed Name		Signature			Month	Day Year
Ben Harrison		[Signature]			02	18 14
16. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry/exit: _____ Transporter signature (for exports only): _____ Date leaving U.S.: _____						
17. Transporter Acknowledgment of Receipt of Materials						
Transporter 1 Printed/Typed Name		Signature			Month	Day Year
Matthew Morris		[Signature]			02	18 14
Transporter 2 Printed/Typed Name		Signature			Month	Day Year
18. Discrepancy						
18a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection						
Manifest Reference Number: _____						
18b. Alternate Facility (or Generator)		U.S. EPA ID Number				
Facility's Phone:						
18c. Signature of Alternate Facility (or Generator)		Month			Day	Year
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)						
1.		2.		3.		4.
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a						
Printed/Typed Name		Signature			Month	Day Year

# NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

<b>NON-HAZARDOUS WASTE MANIFEST</b>		1. Generator's US EPA ID No. ORD 000032499		Manifest Document No. 19145		2. Page 1 of 1	
3. Generator's Name and Mailing Address Wilton O. Brown 1610 N. Pier 99 St. Portland, OR 97217							
4. Generator's Phone (503) 224-3206							
5. Transporter 1 Company Name WasteXpress		6. US EPA ID Number ORD 000023150		A. State Transporter's ID 881002		B. Transporter 1 Phone 503-224-3206	
7. Transporter 2 Company Name		8. US EPA ID Number		C. State Transporter's ID		D. Transporter 2 Phone	
9. Designated Facility Name and Site Address DPV/Bravo 4927 NW Front Ave. Portland, OR 97210		10. US EPA ID Number ORD 027704816		E. State Facility's ID		F. Facility's Phone mm 503-261-9800 503-224-3206	
11. WASTE DESCRIPTION				12. Containers		13. Total Quantity	
				No. Type		Unit Wt./Vol.	
a. NON-Regulated Waste, Liquids, N.O.S., (Tank Wash)				3 du		90 G	
b.							
c.							
d.							
G. Additional Descriptions for Materials Listed Above 11a Pending Flash Test				H. Handling Codes for Wastes Listed Above			
15. Special Handling Instructions and Additional Information							
16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.							
Printed/Typed Name Matthew Morris Ben Harrison				Signature 		Date Month Day Year 02 18 14	
17. Transporter 1 Acknowledgement of Receipt of Materials				Date			
Printed/Typed Name Matthew Morris				Signature 		Month Day Year 2 18 14	
18. Transporter 2 Acknowledgement of Receipt of Materials				Date			
Printed/Typed Name				Signature		Month Day Year	
19. Discrepancy Indication Space							
20. Facility Owner or Operator; Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.							
Printed/Typed Name				Signature		Date Month Day Year	

NON-HAZARDOUS WASTE

GENERATOR

TRANSPORTER

FACILITY



# NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

<b>NON-HAZARDOUS WASTE MANIFEST</b>		1. Generator's US EPA ID No. <b>ORQ 0000 32499</b>		Manifest Document No. <b>19145</b>		2. Page 1 of 1	
3. Generator's Name and Mailing Address <b>Milton O. Brown 1610 N. Pier 99 St. Portland, OR 97217</b>							
4. Generator's Phone ( <b>503</b> ) <b>224 3206</b>							
5. Transporter 1 Company Name <b>WasteXpress</b>		6. US EPA ID Number <b>ORQ 0000 23150</b>		A. State Transporter's ID <b>881002</b>			
7. Transporter 2 Company Name		8. US EPA ID Number		B. Transporter 1 Phone ( <b>503</b> ) <b>224-3206</b>			
				C. State Transporter's ID			
				D. Transporter 2 Phone			
9. Designated Facility Name and Site Address <b>TRU 17613 N. Lombard Portland, OR 97203</b>		10. US EPA ID Number <b>ORQ 0000 11643</b>		E. State Facility's ID			
				F. Facility's Phone ( <b>503</b> ) <b>224-3206</b>			
11. WASTE DESCRIPTION				12. Containers		13. Total Quantity	
				No. Type		Unit Wt./Vol.	
				a. <b>Non-Regulated Waste, Solids, NORS, (Absorbent)</b>		<b>1 DM 10 5</b>	
				b.			
				c.			
d.							
G. Additional Descriptions for Materials Listed Above				H. Handling Codes for Wastes Listed Above			
15. Special Handling Instructions and Additional Information							
<b>16. GENERATOR'S CERTIFICATION:</b> I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.							
Printed/Typed Name <b>Ben Harrison</b>				Signature <i>[Signature]</i>		Date <b>2/18/14</b>	
17. Transporter 1 Acknowledgement of Receipt of Materials				Date			
Printed/Typed Name <b>Matthew Morris</b>				Signature <i>[Signature]</i>		Date <b>2/18/14</b>	
18. Transporter 2 Acknowledgement of Receipt of Materials				Date			
Printed/Typed Name				Signature		Date Month Day Year	
19. Discrepancy Indication Space							
20. Facility Owner or Operator; Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.				Date			
Printed/Typed Name				Signature		Date Month Day Year	

NON-HAZARDOUS WASTE

GENERATOR

TRANSPORTER

FACILITY

# NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

<b>NON-HAZARDOUS WASTE MANIFEST</b>		1. Generator's US EPA ID No. <b>ORQ0000032499</b>		Manifest Document No. <b>19161</b>		2. Page 1 of 1	
3. Generator's Name and Mailing Address <b>MILLER &amp; BROWN 1610N, Pier 99 St. Portland, OR</b>							
4. Generator's Phone ( <b>503</b> ) <b>224-3206</b>							
5. Transporter 1 Company Name <b>WasteXpress</b>		6. US EPA ID Number <b>ORQ0000023150</b>		A. State Transporter's ID <b>8810021</b>			
7. Transporter 2 Company Name		8. US EPA ID Number		B. Transporter 1 Phone ( <b>503</b> ) <b>224-3206</b>			
				C. State Transporter's ID			
				D. Transporter 2 Phone			
9. Designated Facility Name and Site Address <b>Pacific Power Inc LLC 14927 NW Front Ave. South Kearney, OR Portland, OR 97210</b>		10. US EPA ID Number <b>ORD027704816</b>		E. State Facility's ID			
				F. Facility's Phone <b>(503) 261-9800</b>			
11. WASTE DESCRIPTION				12. Containers		13. Total Quantity	
				No. Type		14. Unit Wt./Vol.	
a. <b>NON-Hazardous Waste, Liquid, N.O.S., (Decon Water)</b>				<b>2 DM</b>		<b>110 G</b>	
b.							
c.							
d.							
G. Additional Descriptions for Materials Listed Above <b>Profiled to PPV #</b>				H. Handling Codes for Wastes Listed Above			
15. Special Handling Instructions and Additional Information							
16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.							
Printed/Typed Name <b>Ben Harrison</b>				Signature <i>[Signature]</i>		Date Month <b>2</b> Day <b>21</b> Year <b>14</b>	
17. Transporter 1 Acknowledgement of Receipt of Materials				Signature <i>[Signature]</i>		Date Month <b>2</b> Day <b>21</b> Year <b>14</b>	
Printed/Typed Name <b>Matthew Morris</b>				Signature		Date Month Day Year	
18. Transporter 2 Acknowledgement of Receipt of Materials				Signature		Date Month Day Year	
Printed/Typed Name				Signature		Date Month Day Year	
19. Discrepancy Indication Space							
20. Facility Owner or Operator; Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.							
Printed/Typed Name				Signature		Date Month Day Year	

NON-HAZARDOUS WASTE

GENERATOR

TRANSPORTER

FACILITY

PROJECT P14089

3-YARDS BLENDED SOIL

**H & H WOOD RECYCLERS**

8401 NE 117th AVE

VANCOUVER, WA 98662

(360) 892-2805

360-892-3526 (fax)

DATE 07/02/2014 WED

3 X @ 26.00

3-WAY BLEND R-CA T1

\*\*\* RETAIL CUSTOMER \*\*\*

SALE

APP: 038476

REF: 062

REC: 62

NO.029026 REG01 CLAUDIA TIME 13:35

THANK YOU !!!

PROJECT P14089

5-YA205 0122020 SDIL

**H & H WOOD RECYCLERS**

8401 NE 117th AVE

VANCOUVER, WA 98662

(360) 892-2805

360-892-3326 (fax)

DATE 07/02/2014 WED  
5 X @ 26.00  
3-WAY BLEND R-CA T1  
\*\*\* RETAIL CUSTOMER \*\*\*

SALE

APP: 031156

REF: 008

REC: 8

NO.028888 REG01 CELESTE TIME 08:28

**THANK YOU !!!**

3020 PIER 99

WOOD WASTE MGMT

7315 N.E. 47th AVE.  
PORTLAND, OR 97218  
PHONE #503-493-3370  
FAX 503-493-3408

Check 10024

cynthia  
TUE 10/08/13 9:36am

1 2-WAY BLEND \$  
7.00 yds @ 25.00 \$/yds \$175.00

SALES \$175.00

HOUSE CHARGE \$175.00  
: TERRA HYDRA  
Balance: \$550.00

WE HAVE THE ABILITY TO DELIVER  
LARGER TRUCK LOADS AT ADDITIONAL  
DISCOUNTED PRICES, ASK WHEN  
SCHEDULING YOUR DELIVERY.  
WOOD WASTE MGMT IS NOT RESPONSIBLE  
FOR DAMAGE TO VEHICLES WHILE LOADING  
OR UNLOADING,

3020 PIER 99

WOOD WASTE MGMT

7315 N.E. 47th AVE.  
PORTLAND, OR 97218  
PHONE #503-493-3370  
FAX 503-493-3408

Check 10002

TERI  
TUE 10/08/13 7:23am

1 2-WAY BLEND \$  
15.00 yds @ 25.00 \$/yds \$375.00

SALES \$375.00

HOUSE CHARGE \$375.00  
: TERRA HYDRA  
Balance: \$375.00

WE HAVE THE ABILITY TO DELIVER  
LARGER TRUCK LOADS AT ADDITIONAL  
DISCOUNTED PRICES, ASK WHEN  
SCHEDULING YOUR DELIVERY.  
WOOD WASTE MGMT IS NOT RESPONSIBLE  
FOR DAMAGE TO VEHICLES WHILE LOADING  
OR UNLOADING,



# Waste Management Profile

Requested Facility: Hillsboro

☐ Check if there are multiple generator locations. Attach locations.

☐ Unsure Profile Number: \_\_\_\_\_

☐ Renewal? Original Profile Number: \_\_\_\_\_

## A. GENERATOR INFORMATION (MATERIAL ORIGIN)

- Generator Name: Milton Brown
- Site Address: 1610 North Pier 99 Street  
(City, State, ZIP) Portland, Oregon 97217
- County: Multnomah
- Contact Name: John Foxwell
- Email: jfoxwell@apexcos.com
- Phone: 503 924-4704 ext 113 7. Fax: \_\_\_\_\_
- Generator EPA ID: \_\_\_\_\_ ☒ N/A
- State ID: \_\_\_\_\_ ☒ N/A

## C. MATERIAL INFORMATION

- Common Name: Soil  
Describe Process Generating Material: ☐ See Attached  

Soil from EPA required cleanup at former ship repair facility.
- Material Composition and Contaminants: ☐ See Attached

1. Copper, lead, zinc, and other metals	<1%
2. PCBs and organochlorine pesticides	<1%
3. TBT	<1%
4. Soil	~99%
	≥100%
- State Waste Codes: \_\_\_\_\_ ☒ N/A
- Color: Grey and brown
- Physical State at 70°F: ☒ Solid ☐ Liquid ☐ Other: \_\_\_\_\_
- Free Liquid Range Percentage: \_\_\_\_\_ to \_\_\_\_\_ ☒ N/A (Solid)
- pH: \_\_\_\_\_ to \_\_\_\_\_ ☒ N/A (Solid)
- Strong Odor: ☐ Yes ☒ No Describe: \_\_\_\_\_
- Flash Point: ☐ <140°F ☐ 140°–199°F ☐ ≥200° ☒ N/A (Solid)

## E. ANALYTICAL AND OTHER REPRESENTATIVE INFORMATION

- Analytical attached ☒ Yes  
Please identify applicable samples and/or lab reports:  

See Table 1 through Table 5, and attached lab reports.  
TCLP results of representative waste sample in Apex Labs Report No. A310036
- Other information attached (such as MSDS)? ☐ Yes

## G. GENERATOR CERTIFICATION (PLEASE READ AND CERTIFY BY SIGNATURE)

By signing this Waste Management Profile, I hereby certify that all information submitted in this and all attached documents contain true and accurate descriptions of this material, and that all relevant information necessary for proper material characterization and to identify known and suspected hazards has been provided. Any analytical data attached was derived from a sample that is representative as defined in 40 CFR 261 – Appendix 1 or by using an equivalent method. All changes occurring in the character of the material (i.e., changes in the process or new analytical) will be identified by the Generator and be disclosed to Waste Management prior to providing the material to Waste Management.

If I am an agent signing on behalf of the Generator, I have confirmed with the Generator that information contained in this Profile is accurate and complete.

Name (Print): MELTON BROWN Date: June 26, 2014

Title: OWNER

Company: \_\_\_\_\_

## B. BILLING INFORMATION

☐ SAME AS GENERATOR

- Billing Name: Stratus Corporation
- Billing Address: 39515 SW Hartley Road  
(City, State, ZIP) Gaston, Oregon 97119
- Contact Name: Scott Flaherty
- Email: s.flaherty@stratuscorp.net
- Phone: 503 985 7912 6. Fax: \_\_\_\_\_
- WM Hauled? ☐ Yes ☒ No
- P.O. Number: TBD

## D. REGULATORY INFORMATION

- EPA Hazardous Waste? ☐ Yes\* ☒ No  
Code: \_\_\_\_\_
  - State Hazardous Waste? ☐ Yes ☒ No  
Code: \_\_\_\_\_
  - Excluded waste under 40 CFR 261.4 (a) or (b)? ☐ Yes\* ☒ No
  - Contains Underlying Hazardous Constituents? ☐ Yes\* ☒ No
  - Contains benzene and subject to Benzene NESHAP? ☐ Yes\* ☒ No
  - Facility remediation subject to 40 CFR 63 GGGGG? ☐ Yes\* ☒ No
  - CERCLA or State-mandated clean-up? ☒ Yes\* ☐ No
  - NRC or State-regulated radioactive or NORM waste? ☐ Yes\* ☒ No
- \*If Yes, see Addendum (page 2) for additional questions and space.
- Contains PCBs? → If Yes, answer a, b and c. ☒ Yes ☐ No
    - Regulated by 40 CFR 761? ☐ Yes ☒ No
    - Remediation under 40 CFR 761.61 (a)? ☐ Yes ☒ No
    - Were PCB imported into the US? ☐ Yes ☒ No
  - Regulated and/or Untreated Medical/Infectious Waste? ☐ Yes ☒ No
  - Contains Asbestos? ☐ Yes: Friable ☐ Yes: Non-Friable ☒ No

## F. SHIPPING AND DOT INFORMATION

- ☒ One-Time Event ☐ Repeat Event/Ongoing Business
- Estimated Quantity/Unit of Measure: 200  
☒ Tons ☐ Yards ☐ Drums ☐ Gallons ☐ Other: \_\_\_\_\_
- Container Type and Size: Truck and Trailer
- USDOT Proper Shipping Name: \_\_\_\_\_ ☒ N/A

Certification Signature

THINK GREEN®

QUESTIONS? CALL 800 963 4776 FOR ASSISTANCE

Last Revised March 20, 2012  
©2011 Waste Management, Inc.



**Only complete this Addendum if prompted by responses on Waste Management Profile (page 1) or to provide additional information. Sections and question numbers correspond to Waste Management Profile.**

Profile Number: \_\_\_\_\_

## SECTION C

Describe Process Generating Material (Continued from page 1):

If more space is needed, please attach additional pages.

Material Composition and Contaminants (Continued from page 1):

If more space is needed, please attach additional pages.

5.	
6.	
7.	
8.	
9.	
10.	
	≥100%

## SECTION D

**Only questions with a "Yes" response on Waste Management Profile (page 1) need to be answered here.**

1. EPA Hazardous Waste

a. Please list all USEPA listed and characteristic waste code numbers:

b. Is the material subject to the Alternative Debris standards (40 CFR 268.45)? ☐ Yes ☐ No

c. Is the material subject to the Alternative Soil standards (40 CFR 268.49)? → If Yes, complete question 4. ☐ Yes ☐ No

d. Is the material exempt from Subpart CC Controls (40 CFR 264.1083 and 265.1084)? ☐ Yes ☐ No

→ If Yes, please select one of the following:

☐ Waste has been determined to be LDR exempt [265.1083(c)(4) and 265.1084(c)(4)] based on the fact that it meets all applicable organic treatment standards (including UHCs for D-coded characteristic wastes) or a Specified Technology has been utilized.

☐ Waste does not qualify for a LDR exemption, but the average VOC at the point of origination is <500 ppmw and this determination was based on analytical testing (upload copy of analysis) or generator knowledge.

2. State Hazardous Waste → Please list all state waste codes: \_\_\_\_\_

3. Excluded Waste → Please select which of the following categories apply to your material:

☐ Delisted Hazardous Waste ☐ Excluded Waste under 40 CFR 261.4 → Specify Exclusion: \_\_\_\_\_

☐ Treated Hazardous Waste Debris ☐ Treated Characteristic Hazardous Waste → If checked, complete question 4.

4. Underlying Hazardous Constituents → Please list all Underlying Hazardous Constituents:

5. Benzene NESHAP → Please include benzene concentration and percent water/moisture in chemical composition.

a. Are you a TSDF? → If yes, please complete Benzene NESHAP questionnaire. If not, continue.

b. What is your facility's current total annual benzene quantity in Megagrams? ☐ <1 Mg ☐ 1–9.99 Mg ☐ ≥10 Mg

c. Is this waste soil from remediation at a closed facility? ☐ Yes ☐ No

d. Has material been treated to remove 99% of the benzene or to achieve <10 ppmw? ☐ Yes ☐ No

e. Is material exempt from controls in accordance with 40 CFR 61.342? ☐ Yes ☐ No

→ If yes, specify exemption: \_\_\_\_\_

f. Based on your knowledge of your waste and the BWON regulations, do you believe that this waste stream is subject to treatment and control requirements at an off-site TSDF? ☐ Yes ☐ No

6. 40 CFR 63 GGGGG → Does the material contain <500 ppw VOHAPs at the point of determination? ☐ Yes ☐ No

7. CERCLA or State-Mandated clean up → Please submit the Record of Decision or other documentation to assist others in the evaluation for proper disposal.

8. NRC or state regulated radioactive or NORM Waste → Please identify Isotopes and pCi/g: \_\_\_\_\_



# Non-Hazardous WAM Approval

Requested Management Facility: **Hillsboro Landfill**

Profile Number: **115796OR**

Waste Approval Expiration Date: **06/30/2015**

## APPROVAL DETAILS

Approval Decision: ☒ Approved ☐ Not Approved

Profile Renewal: ☐ Yes ☒ No

Management Method: **Alternate Daily Cover (ADC)**

Generator Name: **Milton O Brown**

Management Facility Precautions, Special Handling Procedures or Limitation on approval:

- Shall not contain free liquid
- Approval Number must accompany each shipment
- Shall not pose a dust nuisance
- Shall not pose a odor nuisance
- Analysis provided shall be representative of all material shipped under this non-hazardous waste profile
- Shall comply with applicable DOT and OSHA labeling, packaging and manifesting requirements
- Shall notify WM disposal location of changes associated with original waste generating process prior to shipment

Additional Conditions:

WM Authorization Name: **Kristin Castner**

Title: **Waste Approval Manager**

WM Authorization Signature: 

Date: **06/30/2014**

Agency Authorization (if Required):

Date:

GENERATOR

INT'L

TRANSPORTER

DESIGNATED FACILITY

NON-HAZARDOUS  
WASTE MANIFEST

1. Generator ID Number

2. Page 1 of

001

3. Emergency Response Phone

4. Waste Tracking Number

ORR-29110

5. Generator's Name and Mailing Address

Generator's Site Address (if different than mailing address)

MILTON O Brown  
1910 North Pier 99 Street  
Portland, OR

Generator's Phone:

6. Transporter 1 Company Name  
WESTCOAST MARINE CLEANING, INCU.S. EPA ID Number  
WAD988479440

7. Transporter 2 Company Name

U.S. EPA ID Number

8. Designated Facility Name and Site Address

Hillsboro Landfill, Inc  
3265 S.E. Minter Bridge Road  
Hillsboro, OR 97123

503-493-7834

U.S. EPA ID Number

Facility's Phone:

9. Waste Shipping Name and Description

10. Containers

No.

Type

11. Total  
Quantity12. Unit  
Wt./Vol.

1. ALTERNATE DAILY COVER (ADC)

001

CM

10

Y

2.

3.

4.

13. Special Handling Instructions and Additional Information

MATERIAL REMOVED FROM STRATUS CORP JOB SITE

PROFILE # 11579601

Box 318-10

TICKET # 1351467

WT 16620

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Officer's Printed/Typed Name

Signature

Month Day Year

Tom Hovine

Tom Hovine

07 10 14

15. International Shipments

☐ Import to U.S.☐ Export from U.S.

Port of entry/exit:

Date leaving U.S.:

Transporter Signature (for exports only):

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name

Signature

Month Day Year

STAN INISH

Stan Inish

07 10 14

Transporter 2 Printed/Typed Name

Signature

Month Day Year

17. Discrepancy

17a. Discrepancy Indication Space

☐ Quantity☐ Type☐ Residue☐ Partial Rejection☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator)

U.S. EPA ID Number

Facility's Phone:

17c. Signature of Alternate Facility (or Generator)

Month Day Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name

Signature

Month Day Year

3205 SE Minter Bridge  
Hillsboro, OR, 97123  
Ph: (503)-640-9427

ONR 29110

Ticket# 1351467

Box 318-10

## WASTE MANAGEMENT

WASTE MANAGEMENT		Carrier	WEST COAST MARINE	WEST COAST MARINE
Customer Name	STRATUSCORP STRATUS CORPORATI	Vehicle#	161	Volume
Ticket Date	07/10/2014	Container		
Payment Type	Credit Account	Driver	stan	
Manual Ticket#		Check#		
Hauling Ticket#		Billing #	0000371	
Route		Gen EPA ID		
State Waste Code		Grid		
Manifest	na			
Destination				
PO	none			
Profile	1157960R (SOIL~STRATUS CORP~BROWN MILTON~1157960R)			
Generator	OR-BROWN MILTON BROWN MILTON 1610 NORTH PIER 99 ST			

	Time	Scale	Operator	Inbound	Gross	48760 lb
In	07/10/2014 12:13:19	Inbound 2	jdb		Tare	32140 lb
Out	07/10/2014 12:35:24	Outbound	sdm		Net	16620 lb
					Tons	8.31

Comments

Consumer Comments? We want to know. Please call.

Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1 Cont Soil Pet-RGC-	100	8.31	Tons				MULT-IN
2 17.5% FEA-17.5% FE	100		%				MULT-IN

Total Tax  
Total Ticket

Driver's Signature

182

## ***Appendix E***

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### **Correspondence**



August 26, 2013

Dr. Kim Kratz  
Oregon State Habitat Office  
NOAA Fisheries  
1201 NE Lloyd Boulevard, Suite 1100  
Portland, Oregon 97232

Re: NOAA Fisheries Notification of Proposed Removal Action  
1610 North Pier 99 Street  
Portland, Oregon  
9725-00

Dear Dr. Kratz:

The purpose of the letter is to notify NOAA Fisheries of the proposed removal action activities which are planned for the Pier 99 – Pier West site located at 1610 North Pier 99 Street in Portland, Oregon. The site is located adjacent to North Portland Harbor – Columbia River, at approximately River Mile 106, immediately west of the Interstate 5 Columbia River bridge (Figures 1 and 2). The entire site is located on a levee that is under the jurisdiction of the United States Army Corps of Engineers (USACE) and is managed by the Peninsula Drainage District (PEN 1). The removal action is being completed pursuant to an Administrative Settlement Agreement and Order on Consent (AO) between the U.S. Environmental Protection Agency (EPA) and the property owner.

EPA has requested that we notify NOAA Fisheries of this project that will be completed in September 2013. Under the AO, EPA is requiring a firm schedule that completes the work during PEN 1's low water work period. We recognize that the Columbia River is home to a number of Endangered Species Act (ESA)-listed aquatic species and wanted to explain the extent of the proposed work along the river bank. The work will be limited to areas above the Ordinary High Water Line (OHWL). Best management practices (BMPs) will be established to prevent sediment migration to areas below the OHWL. The BMPs will be inspected and maintained throughout the construction period and will remain in place until vegetation is established. The proposed work activities are summarized on Figure 3, including:

- Excavating contaminated soil from the upland area at the location of the "Gravel Filter";
- Removing the discharge pipe from "Gravel Filter", the outfall, and contaminated soils at the end of the pipe;
- Clearing bank vegetation, predominantly invasive species (blackberries) above the OHWL;
- Inspecting the riverbank by a geotechnical engineer to determine the scope of stabilization measures;
- Grubbing bank of root material and re-grading as needed to improve bank stability; and
- Bank restoration, including stabilizing using jute matting and re-vegetation (Hydroseeding).

The removal action will remove contaminated soils from upland areas adjacent to the site, will remove an unnecessary discharge pipe and outfall, and will stabilize the existing bank to prevent erosion.

If you have any comments or concerns regarding this proposed work, please contact me at (503) 924-4704 Ext. 113. Additionally, Jeffry Rodin, EPA's project manager, is also available to for your questions. Jeffry can be reached at (206) 553-6709.

Sincerely,  
Apex Companies, LLC

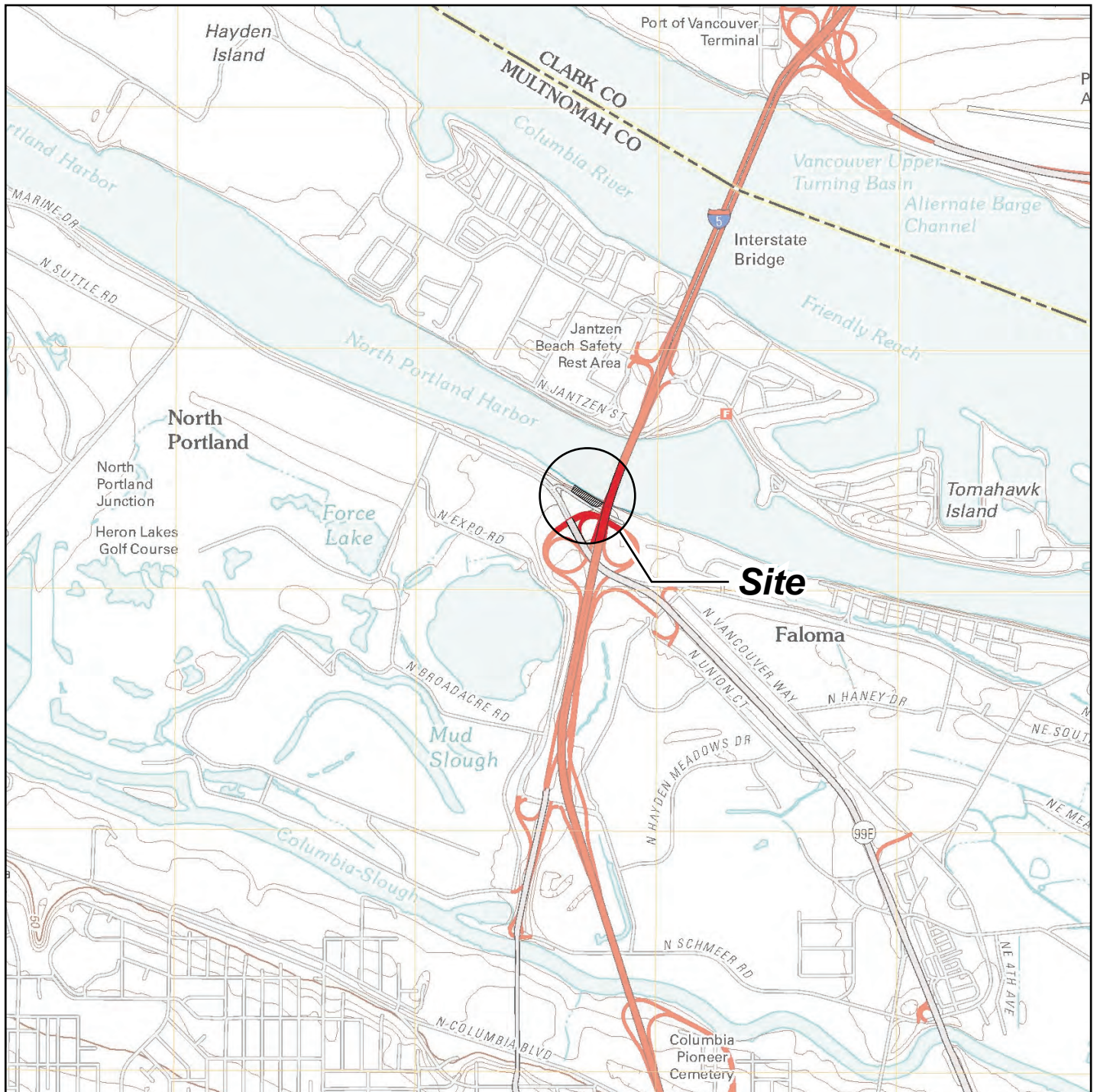
A handwritten signature in black ink, appearing to read "John Foxwell". The signature is fluid and cursive, with the first name "John" written in a more compact, looped style and the last name "Foxwell" written in a more extended, cursive style.

John Foxwell, R.G.

**ATTACHMENTS:**

Figure 1 – Site Location Map  
Figure 2 – Site Vicinity Plan  
Figure 3 – Removal Summary

Attachment A – EPA Removal Action Decision Memorandum



**Note:** Base map prepared from USGS 7.5-minute quadrangle of Portland, OR, dated 2011 as provided by USGS.gov.

0 2,000 4,000  
Approximate Scale in Feet



## Site Location Map

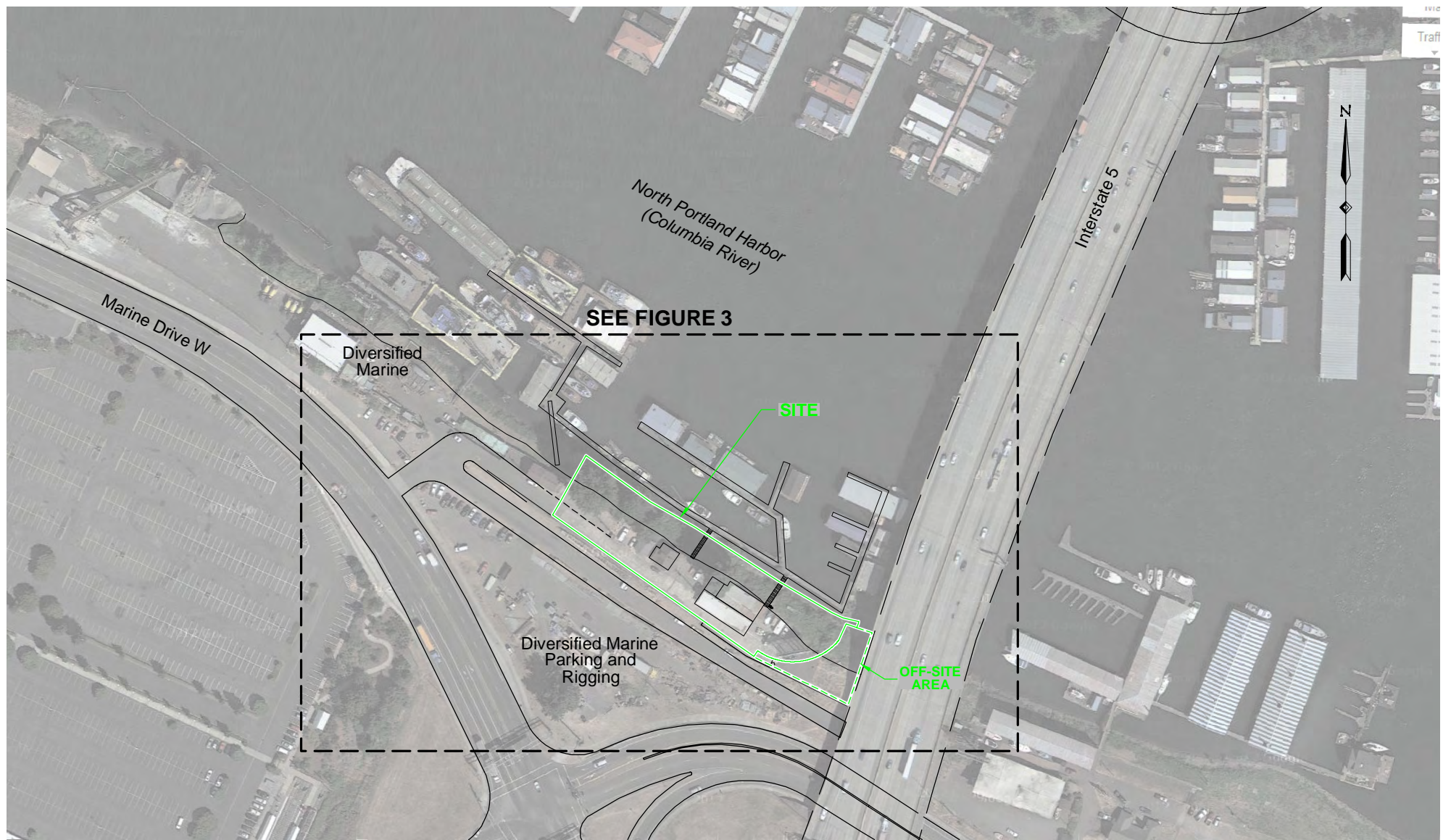
Removal Action Work Plan  
Pier 99 - Portland Site  
Portland, Oregon



Apex Companies, LLC  
3015 SW First Avenue  
Portland, Oregon 97201

Project Number	1975-00
August 2013	

Figure  
**1**



**Note:** Base map prepared from Google Maps (aerial dated August 2012) and tax lot boundaries from City of Portland datasets (2010).

0 200 400  
Scale in Feet

## Site Vicinity Plan

Removal Action Work Plan  
Pier 99 - Portland Site  
Portland, Oregon



Apex Companies, LLC  
3015 SW First Avenue  
Portland, Oregon 97201

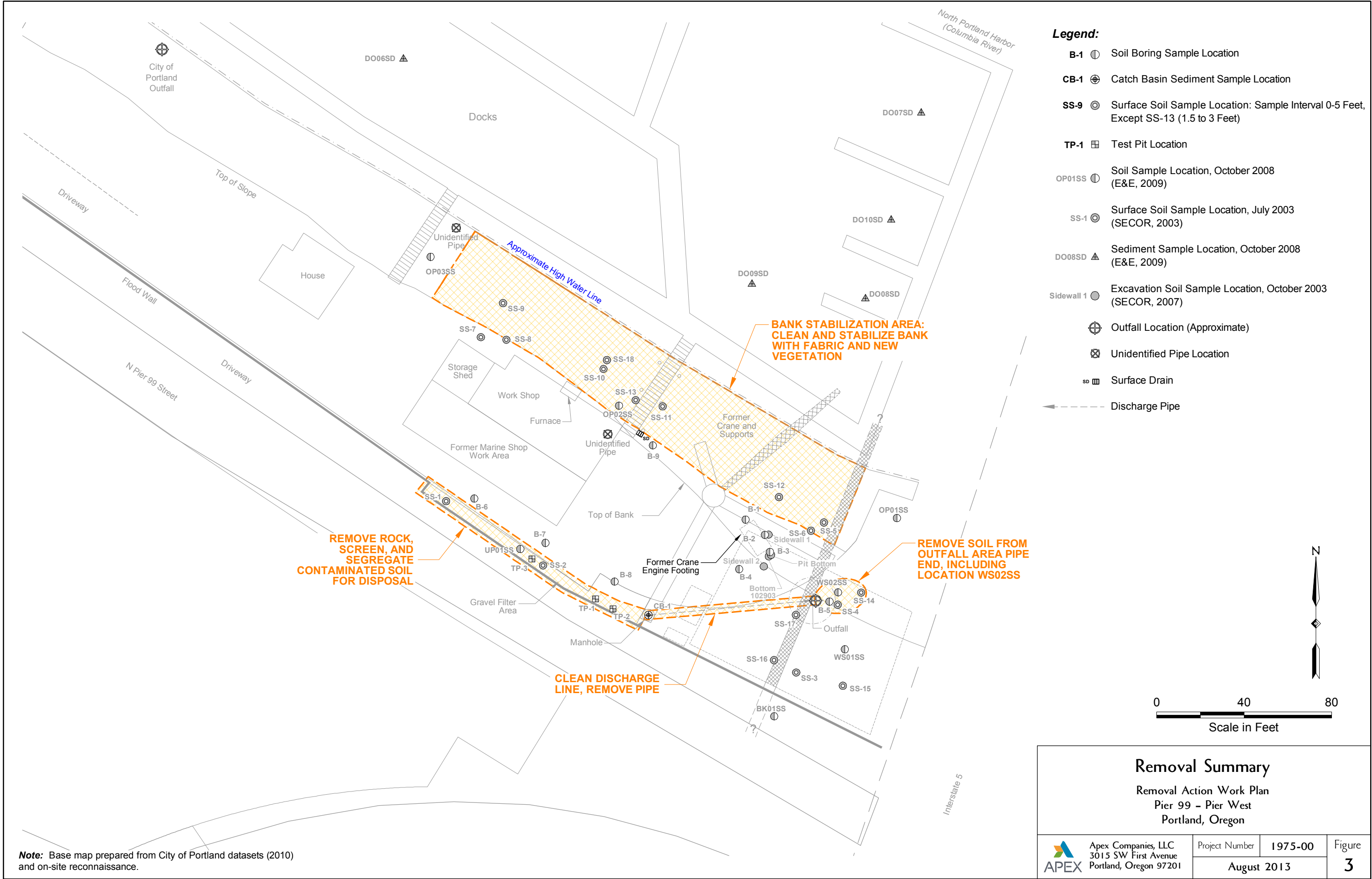
Project Number

1975-00

August 2013

Figure

2



***Attachment A***

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**EPA Removal Action Decision Memorandum**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10

1200 Sixth Avenue, Suite 900  
Seattle, WA 98101-3140

AUG 15 2013

OFFICE OF  
ENVIRONMENTAL  
CLEANUP

MEMORANDUM

SUBJECT: Action Memorandum for the 1610 North Pier 99 Site in Portland,  
Multnomah County, Oregon

FROM: Jeffry Rodin, On-Scene Coordinator  
Emergency Response Unit

THRU: Wally Moon, Manager  
Emergency Preparedness and Prevention Unit

TO: Chris D. Field, Manager  
Emergency Management Program

I. PURPOSE

The purpose of this Action Memorandum is to request and document approval of the selected non-time critical removal action described herein for the 1610 North Pier 99 Street Site located in Portland, Multnomah County, Oregon. The removal action is expected to be conducted by Milton Brown, the Potentially Responsible Party under the oversight of the United States Environmental Protection Agency and in accordance with an Administrative Settlement Agreement and Order on Consent pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended, 42 U.S.C. §§ 9601, *et seq.*

II. SITE CONDITIONS AND BACKGROUND

The CERCLIS ID No. is ORN001002699 and the Site ID Number is 10KM.

A. Site Description

1. Removal site evaluation

The Site was used for a variety of different marine-related purposes such as the

manufacturing and repair of commercial and recreational boats from 1937 through 2001. There is substantial information indicating that human health and environmental impacts associated with the marine-related use are present at the Site.

## 2. Physical Location

The Site is located at 1610 North Pier 99 Street, adjacent to the Columbia River and Interstate 5. The precise location is 45.6065 North Latitude; -122.6829 West Longitude, Willamette Meridian. The Site consists of docks that extend into North Portland Harbor, an occupied residence, main operations building, steel crane, driveway, shed and manhole. Boat building, repair, and machine shop activities have occurred on-site since about 1937.

The Site is bounded by vacant land to the east and south, the North Portland Harbor - Columbia River to the north, Pier 99 moorage and Diversified Marine, Inc. to the west, and a parking area to the south. The Site is a 1.07-acre parcel with associated docks in the North Portland Harbor - Columbia River. Figure 1 displays the Site vicinity map. The Site is currently being used to store marine vessels in the boat houses and slips along the dock.

Meteorological data from the National Weather Service shows Portland receives approximately 36.3 inches of precipitation per year, with 90% falling between October and May.

The entire Site lies within the Columbia River's 100-year flood zone, therefore flood waters could mobilize any surface contamination at the Site. The distance from the Site source area to surface water (the Columbia River) is approximately 35 feet. The Site is essentially flat with a wall running along the southern boundary of the Site. The northern boundary slopes toward the Columbia River. The majority of the site is paved. However, the embankment leading to the river, roughly 50 feet high with a greater than 1:1 slope, is covered with vegetation and surface soils.

The nearest residence (1531/1601 N. Marine Drive) shares the same tax lot as the Site. Other upland residences are located across I-5, approximately 0.3 mile east-southeast of the Site, and across North Portland Harbor, about 0.4 mile northeast and 0.5 mile north-northwest of the Site.

In addition to the upland residences, there are approximately 200 houseboats moored along the north shore of North Portland Harbor, within 0.5 mile of the site. Nearly 80% of these are located either directly across the harbor or downstream from the Site. The nearest is located approximately 525 feet north of the downstream end of the Site.

The Columbia River is a known fishery and habitat used by federal-listed threatened species: Lower Columbia River Evolutionarily Significant Unit (ESU) Chinook salmon (*Oncorhynchus tshawytscha*), both the spring and fall run; Lower Columbia River ESU Coho salmon (*O. kisutch*), Lower Columbia River ESU steelhead (*O. mykiss*), both the summer

and winter run; and Lower Columbia River ESU Chum salmon (*O. keta*). It is estimated from National Wetland Inventory maps that approximately 7.978 miles of wetland frontage exists within fifteen miles of the Site.

### **3. Site characteristics**

The Site was first used as a boat yard in 1937. The boat yard, known as Westerlund Boat and Machine Shop, built and repaired commercial fishing and pleasure boats and manufactured marine transmissions. Sometime after World War II, a floating barge crane that had been servicing the boat yard was replaced with a fixed steel crane on the banks of the North Portland Harbor - Columbia River. The original owner continued to work at the Site until his death in approximately 1975. From 1975 until 1984, the Site was operated as a machine shop under the name Schrouder's Machine Shop. From 1984 until 1986, the Site was operated as an upholstery shop under the name George's Upholstery. From 1986 until 1988, the Site was operated as a marine vessel storage and repair facility under the name Harbor 2 Boatyard. Schooner Creek Boat Works, a boat building and repair business, operated at the Site from 1988 until July of 2000 as a marine vessel storage, painting, fiberglass, and metalwork repair, and general repair of marine vessels. Beginning in 2001, the Site was leased by Guy Boyden and operated under the name Mermaid Marine, Inc. Since 2001, the Site has been used as a residence, a workshop for a houseboat repair company, and parking and access to boat slips in North Portland Harbor-Columbia River. During the site's 70 plus-year history as a boat yard, work may have occurred over water, but the nature and extent of this work is unknown.

The Site includes docks that extend into North Portland Harbor - Columbia River, and a sunken boat is located between the west dock extension and the main dock walkway. Two sets of stairs lead from the Site down a slope to the docks (Figure 2). At the top of the stairs there is a residence, a main operations building, the base of the former steel crane, a driveway, and a shed. The shed is the area where chemicals, boats, and other machinery were stored, while the main operations building in the middle of the Site was where most refurbishing and machining operations took place.

Current uses at the Site include residential use of the house on the Site and general shop and storage uses in the workshop.

### **4. Release or threatened release into the environment of a hazardous substance, or pollutant or contaminant**

The contaminants of concern at the Site include volatile organic compounds (VOCs) (dibutyltin, monobutyltin, tributyltin), semivolatile organic compounds (SVOCs) [bis(2-ethylhexyl)phthalate, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene] chlorinated pesticides (4,4-DDD, 4,4-DDT, heptachlor epoxide), PCBs (Aroclor-1248 and Aroclor-1254), and metals (antimony, arsenic, chromium, copper, lead, mercury). These

substances are potential hazardous substances, pollutants, or contaminants as defined by Sections 101(14) and 101(33) of CERCLA, 42 U.S.C. §§ 9601(14) and (33). Other hazardous substances may also be on-Site.

Data regarding the nature and extent of the contaminants of concern found at the Site are summarized below. A more thorough discussion of the Site investigations and data is found in the project Engineering Evaluation/Cost Analysis (EE/CA) document.

**i. Oregon Department of Environmental Quality Pollution Complaints**

Between September 1991 and June 1999, the Oregon Department of Environmental Quality (ODEQ) received six pollution complaints alleging that ongoing work at the SCBW were contaminating the Columbia River and nearby properties. The nature of each of the complaints and follow-up by ODEQ are as follows:

- September 1991. ODEQ received a complaint that SCBW was improperly disposing of waste chemicals. A visit to the property by ODEQ staff revealed that paint thinner wastes were improperly placed in a dumpster for disposal. ODEQ personnel advised SCBW personnel to discontinue this practice.
- October 1992. ODEQ received a complaint alleging that SCBW was pressure washing and stripping cuprous oxide-containing paint from a boat hull directly into the Columbia River. A second complaint received in October 1992 alleged that primer paint being sanded from the hull of a boat was being discharged directly to the Columbia River; however, SCBW claimed the paint primer contained no toxic products once dry. These complaints resulted in SCBW receiving two Notices of Non-Compliance for discharging waste to the river.
- June 1999. ODEQ received a complaint alleging that SCBW was spray-painting boat hulls outdoors without a spray booth. The owner of SCBW indicated painting activities only involved a few boats and would likely not happen again. No enforcement action was taken regarding this complaint.
- April 2002. ODEQ received two complaints from Mermaid Marine, Inc. that SCBW had left behind sufficient wastes to hinder further use of the Site. Fiberglass dust was alleged to cover much of the Site, the river bank was alleged to be littered with painting debris and old hull paint wastes, and crankcase oil from a site crane was alleged to have been drained directly into the river embankment. Oil-saturated soils along the embankment were alleged to be producing an active petroleum seep to the river, site sewage and storm water were alleged to drain directly into the river. The Site was forwarded to the ODEQ Site Assessment Section for resolution.

## **ii. 2003 Expanded Preliminary Assessment**

In 2003, Mr. Brown, at the request of ODEQ, conducted an Expanded Preliminary Assessment (XPA). During the XPA, petroleum and lead contamination were encountered near a crane located on-Site. These findings appeared to verify previous reports that during oil changes of the crane crank case, the oil was allowed to drain onto the ground and run down the embankment into the river. Based on the findings of the XPA, an excavation of contaminated soil was recommended and conducted. Approximately 21.5 cubic yards of contaminated soil were removed from the area immediately surrounding the crane. After the soil excavation, three samples were collected from the bottom of the excavation. These samples, taken from roughly 7 feet below ground surface, were still contaminated with total petroleum hydrocarbons and lead but at concentrations below the Site-specific risk-based concentrations (RBCs), which were calculated by ODEQ.

## **iii. 2007 EPA Site Investigation**

In July 2007, ODEQ referred the Site to EPA for further investigation under the federal Superfund program. In 2009, the EPA Site Assessment Program completed a Site Inspection (SI) for the Site. Surface soil samples were collected from the upland area beneath the crane, the waste storage area, the embankment, and the Columbia River. The samples were submitted to an analytical laboratory and tested for a comprehensive list of contaminants of potential concern including SVOCs, VOCs, Target Analyte List (TAL) metals, pesticides/ polychlorinated biphenyls (PCBs), and organotins. Soil sample results have been compared to Oregon RBCs and EPA regional soil screening levels for soil ingestion, dermal contact, and inhalation and soil samples were also compared to Oregon sediment bioaccumulation screening level. Sample results for the SI investigation are provided in Table 1. The surface soil sample results indicate that organotins (dibutyltin, monobutyltin, and tributyltin), pesticides (4,4-DDD and heptachlor epoxide), PCBs (Aroclor-1248 and Aroclor-1254) and TAL metals (antimony, arsenic, chromium, copper, and lead) were detected at concentrations that exceeded regulatory criteria. Based on the findings in the report, further action under CERCLA was recommended. The Site was then referred to the EPA Superfund Removal Program for evaluation.

## **iv. 2013 Engineering Evaluation/Cost Analysis**

Apex Companies, LLC prepared an Engineering Evaluation/Cost Analysis (EE/CA) pursuant to an Administrative Settlement Agreement and Order on Consent dated August 30, 2012 between EPA and Mr. Brown. The EE/CA assesses potential removal actions to reduce risks to human health and the environment associated with contamination at the Site. For the EE/CA, the Site was divided into operable units (OUs) as follows:

- OU 1 – Bank Area;
- OU 2 – Eastern Solid Waste Storage Area (Eastern Unimproved Area);
- OU 3 – Gravel Filter Area and Upland Boat Maintenance Repair Area; and
- OU 4 – Former Crane Area.

Samples were collected from each of the OUs and were submitted to an analytical laboratory for analysis of TAL metals, SVOCs, pesticides/PCBs, and organotins. The samples were evaluated for principal threat chemicals for human health and ecological receptors using EPA's Removal Management Levels for human health and adjusted sediment screening levels for ecological risks (EPA does not have removal screening criteria for ecological risks).

#### Analytical Results – OU 1 (Bank Area)

Six surface soil samples (SS-9 through SS-13, and SS-18) were collected from OU 1. TAL metals (antimony, copper, lead, and mercury), pesticides (4,4-DDE, 4,4-DDD, and 4,4-DDT), and SVOCs [bis(2-ethylhexyl)phthalate, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene] were detected in samples at concentrations that exceeded the principal threat criteria.

#### Analytical Results – OU 2 (Eastern Unimproved Area)

Three soil samples from boreholes B-4 and B-5 and four surface soil samples (SS-14 through SS-17) were collected from OU 2. No TAL metals, SVOCs, pesticides/PCBs, or organotins were detected at concentrations that exceeded the principal threat criteria in any of the samples collected from OU 2.

#### Analytical Results – OU 3 (Gravel Filter Area and Upland Boat Maintenance Repair Area)

Five soil samples from test pits TP-2 and TP-3 and six soil samples from boreholes B-6 through B-8 were collected from OU 3. TAL Metals (copper, lead, and zinc), pesticides (4,4-DDD), and SVOCs [bis(2-ethylhexyl)phthalate, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene] were detected in samples at concentrations that exceeded the principal threat criteria.

#### Analytical Results – OU 4 (Former Crane Area)

Eight soil samples from boreholes B-1 through B-3 were collected from OU 4. No TAL metals, SVOCs, pesticides/PCBs, or organotins were detected at concentrations that exceeded the principal threat criteria in any of the samples collected from OU 4.

### **5. National Priority List Status**

The Site is not listed on the National Priority List (NPL) nor has it been proposed for the NPL, and the Site is not expected to be referred to EPA's Remedial Program.

## **6. Maps, pictures, and other graphic representations**

Figure 1 is the Site location map. Figure 2 illustrates the current layout of the Site.

### **B. Other Actions to Date**

#### **1. Previous Actions**

There has been no government or private CERCLA or CWA actions that have been undertaken in the past and not previously discussed.

#### **2. Current actions**

There are no government or private cleanup activities that are currently being performed at the Site.

### **C. State and Local Authorities' Roles**

#### **1. State and local actions to date**

ODEQ requested EPA assistance with characterization of contamination associated with the Site in July 2007. The entire Site is located on a levee that is under the jurisdiction of the United States Corps of Engineers (Corps) and managed by the Peninsula Drainage District Number 1. ODEQ has been involved with review of Site-related documents.

No written comments were received regarding the EE/CA.

#### **2. Potential for continued State/local response**

ODEQ is expected to remain involved in future cleanup activities. Additionally, because the Site is situated on land administered by the Corps, the timing of removal activities at the Site will be closely coordinated with the Corps.

#### **3. Government-to-Government consultation**

Government-to-government consultation was initiated by EPA with the Grand Ronde, Siletz, Warm Springs and Yakama Tribes. None of the tribes to date have indicated they wish to pursue formal government to government consultation.

Informal communication continues with the Grand Ronde to assure cultural resource concerns are adequately addressed during the removal process, and with the Yakama tribe regarding removal action levels.

### **III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES**

The current conditions at this Site meet the following factors which indicate that the Site may pose a threat to the public health or welfare or the environment, and a removal action is appropriate under Section 300.415(b)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. § 300.415(b)(2).

#### **1. Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants (300.415(b)(2)(i)).**

The contaminants of concern found at the Site include VOCs, SVOCs, pesticides, PCBs, and metals mixed with oil. Refer to attached Table 1 for a discussion of the human health effects associated with the Site contaminants of concern. As with all hazardous substances and certain substances mixed with oil, the nature and extent of the health effect will depend on many factors including composition, concentration, and length of time exposed.

The complete exposure pathways for soil include dermal, ingestion, and inhalation. Workers, nearby residents, recreationists, and/or trespassers could be exposed to the Site contaminants found in soil. Although not open to the public, access to the Site is unrestricted and entry and egress can be gained from both land and water. There are no physical barriers restricting access or institutional controls to minimize the potential for human exposure to Site contamination by limiting land or resource use.

#### **2. Actual or potential contamination of drinking water supplies or sensitive ecosystems (300.415(b)(2)(ii)).**

Wetland areas that attract sensitive wildlife species are known to exist downstream of the Site. Migratory waterfowl and songbirds have been observed along these wetland areas. A major heronry is located approximately 1 mile from the Site (EPA ECSI Database). The Smith and Bybee Wetland is the largest protected wetland within an American City.

Ecological receptors can become exposed to Site contaminants through direct contact with the contaminants of concern, with water and sediments contaminated by the contaminants of concern, and by ingestion of the contaminants of concern and contaminated water and sediments. Factors that may affect migration of hazardous substances or pollutants or contaminants include rainfall, erosion, and infiltration into the gravel bed filter that leads to outfalls along the Columbia River edge.

**3. Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released (300.415(b)(2)(v)).**

Because the soils are partially vegetated, rainfall or other forms of run-off inducing events will tend to spread the contaminated materials throughout and further from the Site. The warmer temperatures and dry weather typical in the summer and fall months in and near the Site contribute to the wind-borne dispersal of contaminants. Additionally, the entire Site lies within the 100-year floodplain, thus floodwaters could also mobilize any surface contamination.

**4. The availability of other appropriate federal or state response mechanisms to respond to the release (300.415(b)(2)(vii)).**

The proposed non-time critical removal action is expected to be conducted by the PRP in accordance with CERCLA with oversight by EPA. If the PRP is unwilling or unable to conduct the proposed response, other than action by EPA, there are no known other appropriate federal or state response mechanisms capable of providing the appropriate resources in the prompt manner needed to address the potential human health and ecological risks associated with the hazardous substances and oil described herein.

**IV. ENDANGERMENT DETERMINATION**

The actual or threatened releases of hazardous substances within and from the Site may present an imminent and substantial endangerment to public health, or welfare, or the environment within the meaning of Section 106(a) of CERCLA, 42 U.S.C § 9606(a).

The actual or threatened discharges of hazardous substances or oil at the Site, may be an imminent and substantial threat to the public health or welfare of the United States, including fish, shellfish, wildlife, public and private property, shorelines, beaches, habitat, and/or other living and nonliving natural resources under the jurisdiction or control of the United States, within the meaning of Section 311(e) of the Clean Water Act, 33 U.S.C. § 1321(e). Further, there may be a discharge or substantial threat of discharge of hazardous substances or oil into or on navigable waters, on adjoining shorelines to the navigable waters, or that may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States, within the meaning of Section 311(c) of the Clean Water Act, 33 U.S.C § 1321(c).

**V. CONSIDERED AND SELECTED ACTIONS AND ESTIMATED COSTS**

The goal of the removal action is to prevent direct contact by workers to contaminated soil and to prevent migration of contaminated soils to the North Portland Harbor-Columbia River.

The removal actions that were considered for the Site included:

- No action;
- OU 3 – Removal of the gravel filter, cleaning and plugging the discharge line;
- OU 3 – Removal of the gravel filter, cleaning and removal of the discharge line;
- OU 3 – Capping the gravel filter, cleaning and plugging the discharge line;
- OU 1 – Stabilization of the bank; and
- OU 1 – Removal of bank soil and bank stabilization.

Each of these alternatives was evaluated for effectiveness, implementability, and cost. A detailed description and individual and comparative analysis of removal action alternatives are found in Section 7 of the project EE/CA.

#### **A. Recommended Action**

The objective of the Removal Action is to prevent contaminated materials from migrating off Site or from presenting a hazard to Site visitors. Based on the results of the sampling associated with the EE/CA (Section II.A.1), Removal Actions to achieve these objectives will be performed in OU 1 and OU 3. Specific cleanup strategies have been prepared for each OU based on the specific physical and chemical properties of each, as described below.

##### **1. Recommended Action Description**

###### **OU 1 – Bank Stabilization**

Removal Action for OU 1 is intended to manage contamination located in the bank and prevent potential migration from the bank to the river through a combination of jute matting and re-vegetation. These actions represent the minimum stabilization techniques that will be implemented under the supervision of a geotechnical engineer or engineering geologist. Current vegetation (blackberries) will be removed from the bank adjacent to the work shop and former crane engine pad. Following removal of the vegetation, the bank will be inspected by a geotechnical engineer or engineering geologist in order to make a determination of whether additional bank stabilization requirements, beyond the measures discussed below, are needed.

The area will be cleared of debris and reinforced with jute matting or a similar material. Topsoil would be added (6-inch thickness) and the bank will be planted with grass (specified vegetation for levee improvements). This will require compliance with the City of Portland Erosion Control Manual during and after implementation above the high water line.

This stabilization will require owner maintenance of the bank for a period of one year to continue removal of blackberries and other invasive vegetation that returns while the grass

on the bank is being established. After one year, the bank will be returned to management by Pen 1, who, through its monitoring and maintenance programs, will be responsible for long-term maintenance moving forward.

### OU 3 – Remove Gravel Filter, Clean and Remove Discharge Line

To achieve the Removal Action objectives for OU 3, waste materials (waste soil and debris) will be physically removed from the gravel filter, and the waste materials will be disposed of at an approved solid waste landfill. Additionally, the discharge line will be cleaned to remove contaminated sediments, and the full length of the discharge line will be physically removed to remove the pathway from the gravel filter area to the bank area. The filter excavation would include the full depth of the filter (identified by the presence of the large-diameter filter rock) and 6 to 12 inches of underlying soil overexcavation.

To reduce the cost of waste materials disposal, the material excavated from the gravel filter will be screened through a mechanical screen to separate the filter rock from the finer-grained soil (less than 1 inch in size) and waste materials. The rock fraction will be retained for use as backfill. Based on a sieve analysis done on the gravel filter material, it is expected that approximately 75% of the excavated volume will consist of the filter rock and will be retained and the remaining soil/waste fraction will require off-Site disposal. Salvageable debris (i.e., large metal or woody debris) will be removed and recycled (assumed to be 10 percent of the excavated volume).

Sampling of the gravel filter excavation bottom and sidewalls will be used to document the effectiveness of the excavation alternative. Based on the available data, it is expected that removal of the gravel filter rock will remove the contaminated materials such that the gravel filter will no longer pose a threat to long-term human health. Following the removal of the waste soil and debris, the screened rock fraction will be backfilled into the gravel filter and compacted. The excavation will be brought to the finish grade with clean imported rock and compacted to a visibly non-yielding condition.

This also includes the removal of the discharge line from the filter and a limited excavation (estimated at 10 cubic yards) from the distal end of the discharge pipe to remove anticipated contaminated materials. It is suspected that the pipe in the area of the eastern solid waste storage area, and this sample is assumed to be indicative of conditions at the end of the pipe. Following the removal of sediment from the pipe, the full length of the pipe will be removed by excavation (together with the additional excavation at the end of the pipe). The pipe excavation will be backfilled with clean imported rock and compacted to a visibly non-yielding condition.

The implementation of the excavation will provide protection immediately after completion by the removal of the gravel filter waste material and discharge pipe sediment. Potential future migration to the bank area will be mitigated by the removal of the drain line.

### Best Management Practices

Best Management Practices (BMPs) will be implemented during construction activities to protect workers, the community, and the environment from short-term construction impacts such as erosion, sedimentation, fugitive dust, noise, and other similar potential impacts.

Non-hazardous wastes and contaminated materials, such as inert construction debris, will be disposed of or recycled in accordance with appropriate solid waste disposal or recycling requirements.

### Greener Cleanup BMPs

Appropriate and practicable greener cleanup BMPs will be implemented during cleanup activities, including but not limited to, minimizing energy consumption (e.g., using new and well-maintained equipment), minimizing generation and transport of fugitive dust (e.g., implementation of construction BMPs), minimizing waste generation through reuse and recycling, minimizing impacts to water resources (e.g., implementation of construction stormwater and surface water BMPs), minimizing areas requiring activity or use limitations (e.g., source removal), minimizing lighting and noise disturbance (e.g., implementation of construction BMPs).

### Long-Term Monitoring and Maintenance

A long-term monitoring and maintenance and repair (M&R) program to be conducted by the PRP and subject to ODEQ oversight under the restrictive covenants will be implemented to ensure the continuing effectiveness of the removal action and to monitor site conditions. As part of the monitoring program, episodic inspections of the bank will be required.

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## **2. Contribution to remedial performance**

The recommended response action may be the first and only action or one of a series of actions depending on post-removal activities such as those necessary to maintain the protectiveness of the cleanup. If future actions are required, the proposed Removal Action will likely not impede those actions based upon available information.

## **3. Engineering Evaluation/Cost Analysis (EE/CA)**

The EE/CA Approval Memorandum was signed and issued by EPA in 2012. An EE/CA document was prepared by the PRP, and on June 21, 2013 EPA released the EE/CA document for review and comment. A notice of availability and brief description of the EE/CA document was published in the The Oregonian. A 30-day public comment period was held from June 21, 2013 to July 21, 2013. Additionally, a web site was established to

allow public viewing of the EE/CA. No comments were received regarding the EE/CA.

#### **4. Applicable or relevant and appropriate requirements (ARARs)**

Removal actions conducted under CERCLA must attain Applicable or Relevant and Appropriate Requirements (ARARs) under federal environmental or state environment or facility siting laws, to the extent practicable. 40 C.F.R. § 300.415(j). In determining whether compliance with ARARs is practicable, EPA may consider the scope of the Removal Action and the urgency of the situation. 40 C.F.R. § 300.415(j). The scope of the Removal Action proposed in this Action Memorandum is limited.

##### **Potential Federal Action-Specific ARARs include:**

**Resource Conservation and Recovery Act, Subtitle C – Hazardous Waste Management (42 U.S.C. §§ 6921-6939f; 40 C.F.R. Parts 260-273).** Federal hazardous waste regulations promulgated pursuant to Subtitle C of RCRA specify hazardous waste identification, management, and disposal requirements. Applicable or relevant and appropriate requirements of RCRA Subtitle C (or the state equivalent) may be satisfied by off-site disposal, consistent with the Off-Site Rule, 40 C.F.R. § 300.440. Where Oregon has an authorized state hazardous waste program (O.A.R. 340-101 and 340-103), it applies in lieu of the federal program.

**Resource Conservation and Recovery Act, Subtitle D – Non-Hazardous Solid Waste Management (42 U.S.C. § 6907; 40 C.F.R. Parts 257 and 258).** Regulations promulgated pursuant to Subtitle D of RCRA establish a framework for controlling the management of non-hazardous solid waste. Subtitle D is potentially applicable to solid waste generation and management at the Site.

**Clean Water Act, National Pollution Discharge Elimination System (33 U.S.C. § 1342; 40 C.F.R. Part 122).** ODEQ has been delegated the authority under the federal Clean Water Act to carry out the National Pollution Discharge Elimination System (NPDES) program in the State of Oregon. The NPDES regulations establish requirements for point source discharges and storm water runoff. In particular for the Site, these regulations are potentially applicable for any point source discharge of contamination to surface water, including stormwater runoff at the Site. If response activities at the Site involve clearing, grading, excavating, or other response activities that will disturb more than one acre of land resulting in storm water discharges, such activities must comply with the substantive requirements for a NPDES Stormwater Discharge Permit to prevent or minimize the discharge of pollutants in stormwater runoff from the disturbed areas to waters of the United States.

##### **Potential State Action-Specific ARARs include:**

ODEQ Division 101, Identification and Listing of Hazardous Waste, and Division 102,

**Standards Applicable to Generators of Hazardous Waste (O.A.R. 340-101 and 340-102)** Provides standards for the identification and listing of hazardous wastes, and the requirements for their proper disposal by hazardous waste generators.

**ODEQ Division 45, Regulations Pertaining to NPDES and WPCF Permits (O.A.R. 340-45)** Prescribes limitations on discharge of wastes and the substantive requirements for NPDES permits from ODEQ.

The statutory ARAR waivers in CERCLA Section 121(d)(4) may be used for removal actions (40 C.F.R. § 300.415(j) (referring to 40 C.F.R. § 300.430(f)(1)(ii)(C))). Under this provision, state ARARs do not have to be attained where the state has not consistently applied, or demonstrated the intention to consistently apply, the standard, requirement, criterion, or limitation in circumstances similar to the response in question. CERCLA Section 121(e) provides that “no Federal, State, or local permit shall be required for the portion of any removal or remedial action conducted entirely onsite, where such remedial action is selected and carried out in compliance with this section.” Only the substantive elements are ARARs with respect to on-site responses. This permit exemption allows the response action to proceed in an expeditious manner, free from potentially lengthy delays associated with the permit process. The lack of permitting authority does not impede implementation of an environmentally protective remedy, since CERCLA and the NCP already provide a procedural blueprint for responding to the release or threatened release of a hazardous substance, or pollutant or contaminant into the environment.

**Potential To-Be-Considered materials are discussed below:**

**EPA Regional Screening Levels (May 2010) for Chemical Contaminants at Superfund Sites.**

**EPA Region 10’s Clean and Green Policy (August 2009).** EPA Region 10’s Clean and Green Policy applies to all Superfund cleanups, including those performed by Potentially Responsible Parties (PRPs). The Policy encourages cleanup practices that, among other things, employ 100% use of renewable energy and energy conservation and efficiency approaches including Energy Star equipment, use cleaner fuels, and employ diesel emissions controls.

**5. Project Schedule**

It is expected that project implementation will begin in August 2013, and will take approximately 1 week to complete.

**B. Estimated Costs**

An analysis of relative costs of the proposed actions is found in Section 7 and Appendix G of the EE/CA. The recommended Removal Action is expected to be conducted by the PRP,

with oversight by EPA. However, if the PRPs are unwilling or unable to conduct the proposed Removal Action, and EPA must do so, the total project ceiling is estimated to be \$220,000, as shown below.

<b><u>Extramural Costs:</u></b>	
<b><u>Regional Removal Allowance Costs:</u></b>	
Total Cleanup Contractor Costs (This cost category includes estimates for ERRS, subcontractors, Notices to Proceed, and Interagency Agreements with Other Federal Agencies.)	\$190,000
<b><u>Other Extramural Costs Not Funded from the Regional Allowance:</u></b>	
Total START, including multiplier costs	
Subtotal Extramural Costs	\$ 10,000
Extramural Costs Contingency (20% of Subtotal, Extramural Costs rounded to nearest thousand.)	\$200,000
	\$ 20,000
<b>TOTAL REMOVAL ACTION PROJECT CEILING</b>	<b>\$220,000</b>

## **VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN**

A delay in action or no action at the Site would increase the actual or potential threats to the public health and/or the environment associated with exposure to the Site contaminants of concern.

## **VII. OUTSTANDING POLICY ISSUES**

There are no outstanding policy issues related to this Site.

## **VIII. ENFORCEMENT**

See the attached "Confidential Enforcement Addendum" for enforcement details.

## IX. DETERMINATION

This decision document sets forth the recommended removal action for the Site, which has been developed in accordance with CERCLA, and is consistent with the NCP. The recommended removal action is based on the Administrative Record for the Site.

Conditions at the Site meet the NCP Section 300.415(b)(2) criteria for a removal and I request your approval of the recommended removal action. The removal action is expected to be performed by the PRP with oversight by EPA. However, if the PRP is unwilling or unable to fund or conduct the recommended removal action, and EPA must do so, the total project ceiling is estimated to be \$220,000.

## X. APPROVAL / DISAPPROVAL

APPROVAL:



Chris D. Field, Manager  
Emergency Management Program

8/15/13 CDF  
~~8/15/14~~  
Date

DISAPPROVAL:

---

Chris D. Field, Manager  
Emergency Management Program

Date

**TABLE 1  
CONTAMINANTS OF CONCERN**

Contaminant of Concern	Human Health Effects
<b>Polychlorinated Biphenyls</b>	
Polychlorinated Biphenyls (Aroclors)	Chronic exposure to some PCB formulations by inhalation in humans results in respiratory tract symptoms, gastrointestinal effects, mild liver effects, and effects on the skin and eyes such as chloracne, skin rashes, and eye irritation. Epidemiological studies indicate an association between dietary PCB exposures and developmental effects. Human studies provide inconclusive, yet suggestive, evidence of an association between PCBs exposure and cancer. Animal studies have reported an increase in liver tumors in rats and mice exposed orally to all tested PCB formulations. The EPA has classified PCBs as a Group B2, probable human carcinogen.
<b>Carcinogenic Polycyclic Aromatic Hydrocarbons</b>	
<u>Benzo(b)fluoranthene</u>	Laboratory animal studies have shown that PAHs can cause harmful effects on the skin, body fluids, and ability to fight disease after both short- and long-term exposure. Other studies have shown reproductive effects, including fertility problems, birth defects, and lower birth weight. These effects have not been shown in humans. The carcinogenic PAHs have been associated with cancer after chronic exposure in both animals and humans. The types of cancer include lung, breast, gastrointestinal, pancreatic, bladder, skin, prostate, and cervical. The EPA classifies benzo(a)pyrene as a B2, or probable human carcinogen.
<u>Bis(2-ethylhexyl)phthalate</u>	Exposure can cause gastric disturbances and diarrhea, skin sensitization and irritation of the eyes or skin and respiratory tract. Bis(2-ethylhexyl)phthalate is associated with increased relative liver weight when exposure occurs orally; however, human toxicity is unknown. It is assumed that a threshold exists where cellular necrosis occurs. The EPA classifies Bis(2-ethylhexyl)phthalate as Group B2, a probable human carcinogen.
<u>Indeno(1,2,3-cd)pyrene</u>	Although there are no human data that specifically link exposure to indeno(1,2,3-cd)pyrene to human cancers, it is a component of mixtures that have been associated with human cancer. In carcinogen bioassays indeno[1,2,3-cd]pyrene exposure resulted in increased incidences of epidermoid carcinomas in a lung implantation study, injection site sarcomas in a subcutaneous injection assay and skin tumors in dermal application studies. As a result, the EPA classifies indeno(1,2,3-cd)pyrene as Group B2, a probable human carcinogen.
<b>Metals</b>	
Antimony	Exposure to antimony at high levels can result in a variety of adverse health effects. Breathing high levels for a long time can irritate your eyes and lungs and can cause heart and lung problems, stomach pain, diarrhea, vomiting, and stomach ulcers. In short-term studies, animals that breathed very high levels of antimony died. Animals that breathed high levels had lung, heart, liver, and kidney damage. In long-term studies, animals that breathed very low levels of antimony had eye irritation, hair loss, lung damage, and heart problems. Problems with fertility were also noted. In animal studies, problems with fertility have been seen when rats breathed very high levels of antimony for a few months. Ingesting large doses of antimony can cause vomiting. We don't know what other effects may be caused by ingesting it. Long-term animal studies have reported liver damage and blood changes when animals ingested antimony. Antimony can irritate the skin if it is left on it.
Arsenic	Acute high-level inhalation to arsenic dust or fumes has resulted in gastrointestinal effects (nausea, diarrhea, abdominal pain). Chronic oral exposure has resulted in gastrointestinal effects, anemia, peripheral neuropathy, skin lesions, hyperpigmentation, and liver or kidney damage in humans. Inorganic arsenic exposure

**TABLE 1**  
**CONTAMINANTS OF CONCERN**

Contaminant of Concern	Human Health Effects
	in humans, by the inhalation route, has been shown to be strongly associated with lung cancer, while ingestion of inorganic arsenic in humans has been linked to a form of skin cancer and also to bladder, liver, and lung cancer. The EPA has classified inorganic arsenic as a Group A, human carcinogen.
Chromium	In general, chromium (VI) compounds are more toxic than chromium (III) compounds. The most sensitive targets of chromium (VI) are the respiratory (nasal and lung irritation and altered pulmonary function following inhalation exposure), gastrointestinal (irritation, ulceration, and stomach and small intestine lesions following oral exposure), hematological (microcytic, hypochromic anemia), and reproductive (decreased sperm count and epididymal damage) system. The primary targets of chromium (III) compounds are the respiratory (following inhalation exposure) and immunological systems. Chromium allergic dermatitis is typically elicited by dermal contact in sensitized individuals. Chromium (VI) is classified as a human carcinogen. Chromium (III) and metallic chromium are not classifiable as to the carcinogenicity to humans.
Copper	High levels of copper can be harmful. Breathing high levels of copper can cause irritation of your nose and throat. Ingesting high levels of copper can cause nausea, vomiting, and diarrhea. Very-high doses of copper can cause damage to your liver and kidneys, and can even cause death.
Lead and compounds	Lead can affect almost every organ and system in the body. The main target for lead toxicity is the nervous system, both in adults and children. Long-term exposure of adults can result in decreased performance in some tests that measure functions of the nervous system. It may also cause weakness in fingers, wrists, or ankles. Lead exposure also causes small increases in blood pressure, particularly in middle-aged and older people and can ultimately cause death. In pregnant women, high levels of exposure to lead may cause miscarriage. High level exposure in men can damage the organs responsible for sperm production.
Mercury	Elemental mercury primarily causes health effects when it is breathed as a vapor where it can be absorbed through the lungs. Symptoms include these: tremors; emotional changes (e.g., mood swings, irritability, nervousness, excessive shyness); insomnia; neuromuscular changes (such as weakness, muscle atrophy, twitching); headaches; disturbances in sensations; changes in nerve responses; performance deficits on tests of cognitive function. At higher exposures there may be kidney effects, respiratory failure and death.
<b>Organotins</b>	
Tributyltin	Tributyltin is an identified immunosuppressant when exposure occurs orally; however, human toxicity is unknown. It is assumed that a threshold exists where cellular necrosis occurs. Some exposure data suggests it is a potent non-allergenic dermal irritant and may cause irritation of the respiratory tract following acute inhalation. The EPA classifies Tributyltin as Group D, not classifiable as a human carcinogen.

## John Foxwell

---

**From:** John Foxwell  
**Sent:** Thursday, September 05, 2013 12:30 PM  
**To:** NELSON James A  
**Cc:** Milt Brown (Mobinv@comcast.net)  
**Subject:** Pier 99 Access Agreement for Apex  
**Attachments:** Draft Removal Action Work Plan.pdf

Hi Jim.

Work plan is attached. Charles Schwarz reviewed the work plan and had no comments.

The work areas will be accessed from the site and will require no access from I-5, nor any work within at least 25 to 50 feet laterally from I-5.

The property owner is:

MILTON O. BROWN  
8320 NE HWY 99  
VANCOUVER, WA 98665

My contact information is in the signature block below.

Apex Companies has a current contract with ODOT, and our insurance is current. The referenced contract is ODOT price agreement 28931.

Thank you for the call earlier and the authorization to start on Monday 9/9/13.

Best regards,

John



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July 31, 2014

Angie Zavala  
Federal On-Scene Coordinator  
Emergency Response Unit  
U.S. EPA Region 10  
1200 Sixth Avenue, Suite 900, ECL-116  
Seattle, WA 98101

Re: Monitoring and Maintenance Report: July 2014 Progress Report  
1610 North Pier 99 Site  
Portland, Oregon  
1975-01

Dear Ms. Zavala:

The United States Environmental Protection Agency (USEPA) has requested this monitoring and maintenance progress report for the removal action at the 1610 North Pier 99 Site (site) in Portland, Oregon. A removal action was completed in Fall 2013 and early Summer 2014. As a condition of the administrative order on consent, USEPA required implementation of a monitoring and maintenance program. The monitoring and maintenance program is described in the USEPA approved Revised Proposal for Monitoring and Maintenance Plan, dated July 17, 2014. This is the first of two progress reports that summarize monitoring and maintenance activities. The second report will be prepared in November 2014.

Apex Companies, LLC (Apex) has been periodically monitoring the site since the work was substantially complete (December 12, 2013, January 3, 2014, February 13, 2014), and several occasions in March through June (at least monthly) as the additional removal work plan addendum was prepared. Following the implementation of the removal action work plan addendum in early July, Apex completed an additional site visit on July 22, 2014. Monitoring has now been completed throughout an entire seasonal wet cycle.

Overall, ground subsidence, slope movement, or channeling has not been observed. As of December 2013, the seeding had aggressively taken at the site and a uniform cover of grass was established. The following specific items were addressed during the monitoring and maintenance period.

**OP02SS Area.** The area around the small removal completed at sample location OP02SS was the slowest area to establish itself. This likely resulted from sand being used as the cover material opposed to topsoil during site restoration. The sand and additional contaminated soil was removed as part of the additional removal in June and July 2014. The area was restored according to the requirements in the work plan entitled "Proposed Additional Focused Removal Activities", dated May 27, 2014. The Owner has installed a waist-high cedar fence that limits access to this area so the grass can grow without disturbance.

**REX-16 Area.** Additional removal was completed at the REX-16 area and the area was restored according to the requirements in the work plan entitled "Proposed Additional Focused Removal Activities", dated May 27, 2014. Site restoration included backfill with topsoil and reseeding, and use of additional vegetated sand bags to reinforce the base of the bank. As of the July 22nd site visit, the grass in this area is beginning to establish itself. No subsidence or water channeling has been observed. This area is regularly irrigated by the owner to ensure that the grass is adequately established.

**Blackberry Removal.** In June 2014, the Owner cut the grass and new blackberry shoots that had grown on the bank. The Owner is continuing this process.

**Erosion Control Maintenance.** The Owner had been maintaining the erosion controls on the site. The Owner periodically removed leaves and debris from the silt fence, and has repaired and reset the silt fence when it periodically gets damaged by weather.

In summary, the removal action has required little maintenance. Site conditions are currently stable. Once the OP02SS and REX-16 areas have grass established, the bank stabilization measures will be fully in place. We will continue monitoring the site and will provide a final monitoring and maintenance report in November, 2014.

If you have any comments or concerns regarding this report, please contact me at (503) 924-4704 Ext. 113.

Sincerely,

Apex Companies LLC,

A handwritten signature in blue ink, appearing to read "John Foxwell", is written over a light yellow rectangular background.

John Foxwell, R.G.  
Sr. Associate Hydrogeologist


Cc: Milt Brown

Attachment: Photo Log

## ATTACHMENT A PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 1	
<b>Photo Date:</b> 10/9/2013	
<b>Orientation:</b> East	
<b>Description:</b>  East bank conditions immediately following restoration measures.	

<b>Photo No:</b> 2	
<b>Photo Date:</b> 10/9/2013	
<b>Orientation:</b> West	
<b>Description:</b>  West bank conditions immediately following restoration measures.	

# ATTACHMENT A PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 3	
<b>Photo Date:</b> 12/12/2013	
<b>Orientation:</b> East	
<b>Description:</b>  East bank conditions, December 2013.	

<b>Photo No:</b> 4	
<b>Photo Date:</b> 12/12/2013	
<b>Orientation:</b> East	
<b>Description:</b>  East bank conditions, December 2013.	

## ATTACHMENT A PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 5	
<b>Photo Date:</b> 12/12/2013	
<b>Orientation:</b> West	
<b>Description:</b>  West bank conditions, December 2014.	
<b>Photo No:</b> 6	
<b>Photo Date:</b> 1/3/2014	
<b>Orientation:</b> Southeast	
<b>Description:</b>  West bank conditions, January 2014.	

## ATTACHMENT A PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 7	
<b>Photo Date:</b> 2/16/2013	
<b>Orientation:</b> NA	
<b>Description:</b>  OP02SS area, February 2014.	
<b>Photo No:</b> 8	
<b>Photo Date:</b> 2/16/2013	
<b>Orientation:</b> NA	
<b>Description:</b>  East bank conditions, February 2014.	

## ATTACHMENT A PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 9	
<b>Photo Date:</b> 6/18/2014	
<b>Orientation:</b> NA	
<b>Description:</b> East bank conditions, June 2014.	
<b>Photo No:</b> 10	
<b>Photo Date:</b> 6/18/2014	
<b>Orientation:</b> NA	
<b>Description:</b> Burn area conditions, June, 2014.	

## ATTACHMENT A PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 11	
<b>Photo Date:</b> 7/22/2014	
<b>Orientation:</b> NA	
<b>Description:</b>  OP02SS area following additional removal, July 2014.	
<b>Photo No:</b> 12	
<b>Photo Date:</b> 7/22/2014	
<b>Orientation:</b> NA	
<b>Description:</b>  Burn area following additional removal, July 2014.	



November 12, 2014

Angie Zavala  
Federal On-Scene Coordinator  
Emergency Response Unit  
U.S. EPA Region 10  
1200 Sixth Avenue, Suite 900, ECL-116  
Seattle, Washington 98101

Re: Monitoring and Maintenance Report: November 2014 Progress Report  
1610 North Pier 99 Site  
Portland, Oregon  
1975-01

Dear Ms. Zavala:

The United States Environmental Protection Agency (USEPA) has requested this monitoring and maintenance progress report for the removal action at the 1610 North Pier 99 Site (site) in Portland, Oregon. A removal action was completed in fall 2013 and early summer 2014. As a condition of the administrative order of consent, USEPA required implementation of a monitoring and maintenance program. The monitoring and maintenance program is described in the USEPA approved Revised Proposal for Monitoring and Maintenance Plan, dated July 17, 2014. This is the second of two scheduled progress reports that summarize monitoring and maintenance activities following the removal action.

Apex Companies, LLC (Apex) monitored the site at least once monthly throughout the late summer and fall (August 25, September 29, October 17 and 24, and November 4, 2014). Slope movement, water channeling, or other erosion has not been observed throughout the removal action area, including the REX-16 Area at the west end of the site. Seeding has aggressively taken cover and a uniform cover of grass is established across the site. The following specific items were addressed during the monitoring and maintenance period.

**REX-16 Area.** Additional removal was completed at the OP02SS and REX-16 areas between June 30 and July 10, 2014. The area was restored according to the requirements in the work plan entitled "Proposed Additional Focused Removal Activities", dated May 27, 2014. Site restoration included backfill with topsoil and reseeding, and use of additional vegetated sand bags to reinforce the base of the bank. This area was replanted in early October 2014 because the grass was slow to establish itself. A uniform cover of grass is now established in this area. No slope movement or water channeling has been observed. Photographs 1 through 3 in Attachment A show the progression of vegetation growth in this area.

**Erosion Control Maintenance.** The Owner has removed the silt fence from the east side of the site. The silt fence will be removed from the west side of the after the 2015 winter season. The Owner has been maintaining the silt fence on the west side of the site periodically throughout the summer. This included removing leaves and debris from the silt fence, and repairing the silt fence when it periodically was damaged.

Monitoring and maintenance activities have consisted of reseeding, blackberry removal and silt fence repair. Photographs 3 through 9 show the consistent vegetation cover established at the site. Now that grass cover has been established and the slope conditions are stable, monitoring and maintenance requirements for the removal action are considered complete. Long-term monitoring of the site will be completed as part of the Post Removal Site Controls that are currently being established by USEPA.

If you have any comments or concerns regarding this report, please contact me at (503) 924-4704 Ext. 113.

Sincerely,  
Apex Companies LLC,

A handwritten signature in blue ink, appearing to read "John Foxwell". The signature is stylized with large loops and a cursive script.

John Foxwell, R.G.  
Sr. Associate Hydrogeologist

cc: Milt Brown

Attachment A: Photograph Log

## ***Attachment A***


---

### **Photograph Log**

## ATTACHMENT A PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon


<b>Photo No:</b> 1	
<b>Photo Date:</b> 9/29/2014	
<b>Orientation:</b> East	
<b>Description:</b>  West bank conditions approximately 90 days after additional removal at burn area.	


<b>Photo No:</b> 2	
<b>Photo Date:</b> 10/17/2014	
<b>Orientation:</b> West	
<b>Description:</b>  West bank conditions approximately 105 days after additional removal at burn area.	

## ATTACHMENT A PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 3	
<b>Photo Date:</b> 11/4/2014	
<b>Orientation:</b> East	
<b>Description:</b>  West bank conditions approximately 125 days after additional removal at burn area.	

<b>Photo No:</b> 4	
<b>Photo Date:</b> 10/17/2014	
<b>Orientation:</b> East	
<b>Description:</b>  OP02SS area	

## ATTACHMENT A PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 5	
<b>Photo Date:</b> 11/14/2014	
<b>Orientation:</b> West	
<b>Description:</b>  OP02SS area	
<b>Photo No:</b> 6	
<b>Photo Date:</b> 10/17/2014	
<b>Orientation:</b> Southeast	
<b>Description:</b>  East end of bank area.	

## ATTACHMENT A PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01


**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 7	
<b>Photo Date:</b> 10/17/2014	
<b>Orientation:</b> NA	
<b>Description:</b> Upper bank area near shop.	
<b>Photo No:</b> 8	
<b>Photo Date:</b> 10/17/2014	
<b>Orientation:</b> NA	
<b>Description:</b> Bank repair area near shop.	

## ATTACHMENT A PHOTOGRAPH LOG

**Project Name:** Pier 99 Removal Action  
**Project Number:** 1975-01

**Client:** Milton O. Brown  
**Location:** Portland, Oregon

<b>Photo No:</b> 9	
<b>Photo Date:</b> 11/14/2014	
<b>Orientation:</b> NA	
<b>Description:</b> Bank repair area near shop.	

## ***Appendix F***

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### **Laboratory Reports**

## ***Appendix F – Laboratory Reports and Quality Assurance Review***

This appendix documents the results of a quality assurance/quality control (QA/QC) review of the analytical data for samples collected from September through July 2014 during the Pier 99 Removal Action. Sample analyses were completed by Apex Labs of Tigard, Oregon and Analytical Resources, Incorporated of Tukwila, Washington. Copies of the analytical laboratory reports are included in this appendix, including:

Report	Sample Date	Sampling Event
A3I0036	9/4/2013	Gravel Filter Waste Profiling
A3I0420	9/19/2013	Confirmation Sampling and Waste Profiling
A3I0420	9/19/2013	TBT Confirmation Sampling
A3I0536	9/25/2013	Confirmation Sampling
A3I0536	9/25/2013	TBT Confirmation Sampling
A3I0564	9/26/2013	Confirmation Sampling
A3J0025	10/1/2013	Confirmation Sampling
A3J0152	10/4/2013	Confirmation Sampling
A4B0365	2/17/2014	EECA Decontamination and Purge Water Additional Waste Profiling
A4F0761	June 30, 2014	Confirmation Sampling and Waste Profiling
A4G0126	July 2, 2014	Confirmation Sampling

The QA review included examination and validation of the sediment and soil sampling laboratory reports, including:

- Chain of custody documentation;
- Holding times;
- Method detection limits;
- Method blanks;

## **Appendix F – Laboratory Reports and Quality Assurance Review**

- Surrogate recoveries;
- Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) recoveries;
- Matrix spike/matrix spike duplicate (MS/MSD) recoveries; and
- Laboratory duplicate and field duplicate relative percent difference (RPD).

The QA review did not include a review of raw data.

### **1.0 Analytical Methods**

**Soil Sample Analysis.** Soil sample analyses included metals using Method 6010C (EPA Method 7471B for mercury), organotin compounds by the Krone Method, organochlorine pesticides by EPA Method 8081, PCBs by EPA Method 8082, and semi-volatile organic compounds (SVOCs) by EPA Method 8270.

### **2.0 Quality Assurance Review**

**Chain of Custody.** The samples were received at the laboratory in good condition and in coolers with ice. A chain of custody form accompanied the samples and all samples were confirmed to arrive at the laboratory.

**Holding Times.** Samples were analyzed within the holding times specified for each analysis method. The one exception was REX-16 (0-6) which was analyzed in lab report A3J0025-03 and is outside holding time for mercury, SVOCs, and pesticides.

**Method Detection Limits.** Method detection limits (MDL) are set by the laboratory and are based on instrumentation abilities, sample matrix, and suggested detection limits by the EPA or the Oregon Department of Environmental Quality (DEQ). In some cases, the MDL may be raised due to high concentrations of analytes in the samples or matrix interferences. MDLs were generally consistent with industry standards and below promulgated regulatory standards when possible (if not raised, as previously discussed).

**Method Blanks.** A method—or laboratory—blank is a sample prepared in the laboratory along with the actual samples and analyzed for the same parameters at the same time. It is used to assess if detected contaminants may have been the result of contamination of the samples in the laboratory. No analytes were detected in the laboratory method blanks, with the following exceptions.

- In lab report A3I0420, sample 3090508-BLK1 two phthalates were detected between 1/2 the MRL and the MRL.

## ***Appendix F – Laboratory Reports and Quality Assurance Review***

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- In lab report A3I0536, sample 3090650-BLK1, phenol was detected in the method blank between 1/2 the MRL.
- In lab report A3I0536, sample A3J0025-01RE1, phenol was detected in the method blank between 1/2 the MRL.
- In lab report A4F0761-01, lead was detected in an associated blank at a level between one-half the MRL and the MRL. Sample results are considered potentially biased high if they are detected less than five times the level found in the blank for organic analyses. For the associated sample, the MRL was 0.2 mg/kg and the detected concentration was 426 mg/kg. Therefore, these data were not qualified further.

**Surrogate Recovery.** Surrogates are organic compounds that are similar in chemical composition to the analytes of interest and spiked into environmental and batch QC samples prior to sample preparation and analysis. Surrogate recoveries for environmental samples are used to evaluate matrix interference on a sample-specific basis. While some surrogate recoveries were outside control criteria, the exceedances were based on diluted surrogates and therefore were not qualified further. Exceptions include:

- In lab report A3I0420, sample 3100052-BLK1 – Decachlorobiphenyl surrogate recovery was high in the method blank and LCS. No analytes were detected in the method blank. The laboratory indicated the data was likely biased high.
- In lab report A3I0420, sample 3090537-DUP1, surrogate spike recovery recovery was high in the laboratory duplicate for 4,4' DDT due to a non-homogenous sample matrix.
- In lab report A3I0536, sample A3I0536-02 and -06 the decachlorobiphenyl surrogate recovery was above control limits and the laboratory indicated the results are likely biased high. These results were flagged as estimates.

**Laboratory Control Sample (LCS).** LCSs were also analyzed by the laboratory to assess the accuracy of the analytical equipment. An LCS sample is prepared from an analyte-free matrix that is then spiked with known levels of the constituents of interest (i.e., a standard). The concentrations are measured and the results are compared to the known spiked levels. This comparison is expressed as percent recovery.

- The LCS was below the control limits for chloroethane. This was a waste profile sample and the date were considered acceptable for use for this purpose.

**Laboratory Control Sample Duplicate (LCSD).** In addition, a second laboratory control sample is prepared as above and analyzed. The percent recoveries for the LCSD were within control limits with the exception of report K1301490. Multiple other control criteria were within quality control limits for these samples so no further corrective action was required. The percent recoveries from the LCSD are compared to the initial LCS to assess the precision of the analytical method. This precision is expressed as a relative percent difference (RPD). The laboratory reviewed the LCS/LCSD RPDs were acceptable.

## ***Appendix F – Laboratory Reports and Quality Assurance Review***

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**Matrix Spike Analyses.** MS analyses are performed on samples submitted to the laboratory that are of the same matrix as the actual sample. The MS sample is spiked with known levels of the constituents of interest. These analyses are used to assess the potential for matrix interference with recovery or detection of the constituents of interest and the accuracy of the determination. The spiked sample results are compared to the expected result (i.e., sample concentration plus spike amount) and reported as percent recovery. Some MS recoveries were outside control criteria, but were resolved using redundant criteria. Exceptions that could not be resolved by the laboratory and are considered estimated values are flagged as estimated value and discussed below.

- In lab report A3I0036, sample GF-HA-COMP, spike recovery was high for barium and the MS/MSD for barium were outside control limits. Barium is not a contaminant of concern at the site and these data were used for waste profiling. Therefore the data were acceptable for use.
- In lab report A3I0036, sample GF-HA-COMP, surrogate recovery was high for mercury and the laboratory reported the data are likely biased high. These data were used for waste profiling and were found acceptable for use for this purpose.
- In lab report A4G0126, spike recovery for lead was outside control limits due to a high concentration of lead present in the sample. Because the LCS was within control limits, the laboratory did not qualify the results.
- In lab report A4F0761, spike recovery for lead was outside control limits due to a high concentration of lead present in the sample. Because the LCS and laboratory duplicate were within control limits, the laboratory did not qualify the results.

**Continuing Calibration Verification.** Calibration is verified throughout the batch run. In some cases, the continuing calibration verification was outside of the control limits as discussed below.

- In lab report A3I0420 was outside the calibration verification for acetone and 2-Butanone for the batch. These results were associated with water analyses for waste profiling and were considered acceptable for use for waste profiling purposes.
- In lab report A3I0420 the CCV for the laboratory control sample 3090508-BS1 was above limits.
- In lab report A3I0536, the antimony concentration in samples 3I0536-01, -02, -03, , -06, -07, -08, are flagged as an estimated concentration and assigned a J Flag because the results was detected below the lowest part of the calibration curve, but above the specified MDL.
- In lab report A3I0536, the phenol CCV was detected above the calibration curve and the results may be biased high
- In lab report A3I0564, the antimony concentration in sample REX-14 (0-6) DUP (A3I0564-04), are flagged as an estimated concentration and assigned a J Flag because the results was detected below the lowest part of the calibration curve, but above the specified MDL.
- In lab report A3I0564, the CCV associated with RAC-1 (0-6) (A3J0025-02) was above the control standards and may be biased high.

## ***Appendix F – Laboratory Reports and Quality Assurance Review***

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- In lab report A3I0536, the antimony concentration in samples RAC-1 (0-6) (A3J0025-02) are flagged as an estimated concentration and assigned a J Flag because the results was detected below the lowest part of the calibration curve, but above the specified MDL.

**Matrix Spike Duplicate.** In addition, a second matrix control sample (i.e., MSD) is prepared as above and analyzed. The percent recoveries for the MSD were within control limits. Multiple other control criteria were within quality control limits for these samples so no further corrective action was required. This is then compared to the initial MS sample to assess the precision of the analytical method (i.e., RPD). The RPD between the MS and MSD samples were outside control criteria for samples in reports A3I0564. The laboratory reviewed these exceedances and were able to resolve each exceedance based on the overall batch QA.

**Laboratory Duplicate.** A laboratory duplicate is a second analysis extracted from a field sample to check on laboratory quality as well as potential variability of the sample matrix. The laboratory duplicate is analyzed and compared to the primary sample to assess the precision of the analytical method. This comparison can be expressed by the RPD between the original and duplicate samples. Laboratory duplicates were analyzed for this project.

**Field Duplicate.** A field duplicate is a second field sample collected from a selected monitoring well. Field duplicate samples serve as a check on laboratory quality as well as potential variability of the sample matrix. The field duplicate is analyzed and compared with the first sample to assess the precision of the analytical method. A field duplicates was collected for REX-14 (0-6). The soil duplicate RPD were within acceptable range.

**Field Blank.** A field blank is a sample of analyte-free water poured into a clean sample container in the field, preserved, and shipped to the laboratory with field samples. Field blanks assess the potential for contamination from field conditions during sampling. There was no field blank analyzed.

**Equipment Blank.** An equipment blank is a sample of analyte-free water poured over or through decontaminated field sampling equipment during a sampling event. Equipment blanks assess contamination from the total sampling, sample preparation, and measurement process when decontaminated sampling equipment is used to collect samples. There was no equipment blank analyzed.

**Trip Blank.** A trip blank is a clean sample of a matrix that is included in the sample cooler with the sample containers provided by the laboratory and is transported to the sampling site and back to the laboratory with the field samples but without having been exposed to sampling procedures. Trip blanks assess contamination introduced during shipping and field-handling activities. There was no trip blank analyzed.

**Other.** In lab report A3I0420, sample REX-1 (0-0.5) (A3I0420-02RE1), chrysene could not be adequately resolved due to matrix interference. The data are flagged with an "X" qualifier.

## ***Appendix F – Laboratory Reports and Quality Assurance Review***

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In lab report A3I0410, PCB analyses are all qualified as estimated concentration based on either matrix interference or multiple aroclors being present. These results are flagged as estimated.

**Conclusion.** In conclusion, the QA objectives have been met, and the data are of sufficient quality for use in this project. No data was rejected, but estimated concentrations are noted in several occasions. For sample RAC-16, mercury, SVOC, and pesticide analyses were analyzed outside of holding time. These compounds are considered stable, and were largely not detected, or detected at low concentrations relative to the MRLs. This data quality exception is considered minor.

# Apex Labs

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503-718-2323 Phone  
503-718-0333 Fax

Friday, September 6, 2013

John Foxwell  
Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

RE: Pier 99 / 1975-01

Enclosed are the results of analyses for work order A310036, which was received by the laboratory on 9/4/2013 at 1:15:00PM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: [DAuvil@apex-labs.com](mailto:DAuvil@apex-labs.com), or by phone at 503-718-2323.

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Darrell Auvil For Darwin Thomas, Business Development Director

Page 1 of 13

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
09/06/13 16:33

## ANALYTICAL REPORT FOR SAMPLES

### SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
GF-HA-Composite	A3I0036-01	Soil	09/04/13 12:20	09/04/13 13:15

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
09/06/13 16:33

## ANALYTICAL SAMPLE RESULTS

### Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
GF-HA-Composite (A3I0036-01)			Matrix: Soil					
Batch: 3090099								
Arsenic	2.03	---	1.21	mg/kg dry	10	09/06/13 11:36	EPA 6020A	Q-42
Barium	78.0	---	1.21	"	"	"	"	
Cadmium	ND	---	0.242	"	"	"	"	
Chromium	9.48	---	1.21	"	"	"	"	
Lead	33.8	---	0.242	"	"	"	"	
Mercury	ND	---	0.0966	"	"	"	"	
Selenium	ND	---	1.21	"	"	"	"	
Silver	ND	---	0.242	"	"	"	"	

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
09/06/13 16:33

## ANALYTICAL SAMPLE RESULTS

### TCLP Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
GF-HA-Composite (A3I0036-01)			Matrix: Soil					
Batch: 3090125								
Arsenic	ND	---	0.100	mg/L	5	09/06/13 14:40	1311/6020A	
Barium	ND	---	0.500	"	"	"	"	
Cadmium	ND	---	0.0500	"	"	"	"	
Chromium	ND	---	0.100	"	"	"	"	
Lead	0.107	---	0.0500	"	"	"	"	
Mercury	ND	---	0.00400	"	"	"	"	
Selenium	ND	---	0.100	"	"	"	"	
Silver	ND	---	0.0500	"	"	"	"	

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
09/06/13 16:33

## ANALYTICAL SAMPLE RESULTS

### Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>GF-HA-Composite (A3I0036-01)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090080</b>			
% Solids	91.0	---	1.00	% by Weight	1	09/06/13 09:55	Apex SOP	

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
09/06/13 16:33

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090099 - EPA 3051A						Soil						
Blank (3090099-BLK1)						Prepared: 09/05/13 15:01		Analyzed: 09/06/13 10:22				
EPA 6020A												
Arsenic	ND	---	1.00	mg/kg wet	10	---	---	---	---	---	---	
Barium	ND	---	1.00	"	"	---	---	---	---	---	---	
Cadmium	ND	---	0.200	"	"	---	---	---	---	---	---	
Chromium	ND	---	1.00	"	"	---	---	---	---	---	---	
Lead	ND	---	0.200	"	"	---	---	---	---	---	---	
Mercury	ND	---	0.0800	"	"	---	---	---	---	---	---	
Selenium	ND	---	1.00	"	"	---	---	---	---	---	---	
Silver	ND	---	0.200	"	"	---	---	---	---	---	---	
LCS (3090099-BS1)						Prepared: 09/05/13 15:01		Analyzed: 09/06/13 10:25				
EPA 6020A												
Arsenic	51.5	---	1.00	mg/kg wet	10	50.0	---	103	80-120%	---	---	
Barium	51.2	---	1.00	"	"	"	---	102	"	---	---	
Cadmium	52.2	---	0.200	"	"	"	---	104	"	---	---	
Chromium	51.3	---	1.00	"	"	"	---	103	"	---	---	
Lead	53.2	---	0.200	"	"	"	---	106	"	---	---	
Mercury	1.00	---	0.0800	"	"	1.00	---	100	"	---	---	
Selenium	25.4	---	1.00	"	"	25.0	---	102	"	---	---	
Silver	24.7	---	0.200	"	"	"	---	99	"	---	---	
Matrix Spike (3090099-MS2)						Prepared: 09/05/13 15:01		Analyzed: 09/06/13 11:39				
QC Source Sample: GF-HA-Composite (A310036-01)												
EPA 6020A												
Arsenic	55.9	---	1.06	mg/kg dry	10	52.9	2.03	102	75-125%	---	---	
Barium	149	---	1.06	"	"	"	78.0	134	"	---	---	Q-01
Cadmium	55.8	---	0.212	"	"	"	0.229	105	"	---	---	
Chromium	62.8	---	1.06	"	"	"	9.48	101	"	---	---	
Lead	83.5	---	0.212	"	"	"	33.8	94	"	---	---	
Mercury	1.10	---	0.0847	"	"	1.06	0.0494	99	"	---	---	
Selenium	26.4	---	1.06	"	"	26.5	ND	100	"	---	---	
Silver	26.4	---	0.212	"	"	"	ND	100	"	---	---	

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Darrell Auvin For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
09/06/13 16:33

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090099 - EPA 3051A						Soil						
Post Spike (3090099-PS2)				Prepared: 09/06/13 12:36    Analyzed: 09/06/13 14:01								
Lead	4480	---		ug/L	10	2310	2110	103	80-120%		---	
Post Spike (3090099-PS3)				Prepared: 09/06/13 12:36    Analyzed: 09/06/13 14:04								
QC Source Sample: GF-HA-Composite (A310036-01)												
EPA 6020A												
Barium	2230	---		ug/L	10	1670	538	102	80-120%		---	

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Page 7 of 13

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
09/06/13 16:33

## QUALITY CONTROL (QC) SAMPLE RESULTS

### TCLP Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	Limits	RPD	RPD Limit	Notes
Batch 3090125 - EPA 1311/3015						Solid						
Blank (3090125-BLK1)						Prepared: 09/06/13 11:43		Analyzed: 09/06/13 14:06				
1311/6020A												
Arsenic	ND	---	0.100	mg/L	5	---	---	---	---	---	---	TCLP
Barium	ND	---	0.500	"	"	---	---	---	---	---	---	TCLP
Cadmium	ND	---	0.0500	"	"	---	---	---	---	---	---	TCLP
Chromium	ND	---	0.100	"	"	---	---	---	---	---	---	TCLP
Lead	ND	---	0.0500	"	"	---	---	---	---	---	---	TCLP
Mercury	ND	---	0.00400	"	"	---	---	---	---	---	---	TCLP
Selenium	ND	---	0.100	"	"	---	---	---	---	---	---	TCLP
Silver	ND	---	0.0500	"	"	---	---	---	---	---	---	TCLP
LCS (3090125-BS1)						Prepared: 09/06/13 11:43		Analyzed: 09/06/13 14:09				
1311/6020A												
Arsenic	2.53	---	0.100	mg/L	5	2.50	---	101	80-120%	---	---	TCLP
Barium	2.58	---	0.500	"	"	"	---	103	"	---	---	TCLP
Cadmium	2.58	---	0.0500	"	"	"	---	103	"	---	---	TCLP
Chromium	2.55	---	0.100	"	"	"	---	102	"	---	---	TCLP
Lead	2.65	---	0.0500	"	"	"	---	106	"	---	---	TCLP
Mercury	0.0514	---	0.00400	"	"	0.0500	---	103	"	---	---	Q-23, TCLP
Selenium	1.25	---	0.100	"	"	1.25	---	100	"	---	---	TCLP
Silver	1.26	---	0.0500	"	"	"	---	101	"	---	---	TCLP
Matrix Spike (3090125-MS2)						Prepared: 09/06/13 11:43		Analyzed: 09/06/13 14:43				
QC Source Sample: GF-HA-Composite (A310036-01)												
1311/6020A												
Arsenic	2.54	---	0.100	mg/L	5	2.50	ND	101	50-150%	---	---	Q-23
Barium	2.89	---	0.500	"	"	"	0.376	101	"	---	---	
Cadmium	2.59	---	0.0500	"	"	"	ND	103	"	---	---	
Chromium	2.57	---	0.100	"	"	"	ND	103	"	---	---	
Lead	2.81	---	0.0500	"	"	"	0.107	108	"	---	---	
Mercury	0.0522	---	0.00400	"	"	0.0500	ND	104	"	---	---	
Selenium	1.26	---	0.100	"	"	1.25	ND	101	"	---	---	
Silver	1.27	---	0.0500	"	"	"	ND	102	"	---	---	

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
09/06/13 16:33

## QUALITY CONTROL (QC) SAMPLE RESULTS

### TCLP Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090125 - EPA 1311/3015							Solid					

Apex Laboratories



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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
09/06/13 16:33

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----	-----------------	-------	------	--------------	---------------	------	-------------	-----	-----------	-------

### Batch 3090080 - Total Solids (Dry Weight)

### Soil

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
09/06/13 16:33

## SAMPLE PREPARATION INFORMATION

### Total Metals by EPA 6020 (ICPMS)

#### Prep: EPA 3051A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3090099							
A3I0036-01	Soil	EPA 6020A	09/04/13 12:20	09/05/13 15:01	0.455g/50mL	0.5g/50mL	1.10

### TCLP Extraction by EPA 1311

#### Prep: EPA 1311 (TCLP)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3090097							
A3I0036-01	Soil	EPA 1311	09/04/13 12:20	09/05/13 16:25	98.81g/1976mL	100g/2000mL	NA

### TCLP Metals by EPA 6020 (ICPMS)

#### Prep: EPA 1311/3015

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3090125							
A3I0036-01	Soil	1311/6020A	09/04/13 12:20	09/06/13 11:43	5mL/50mL	5mL/50mL	1.00

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**Apex Companies, LLC**

3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**

Project Number: 1975-01

Project Manager: John Foxwell

**Reported:**

09/06/13 16:33

## Notes and Definitions

### Qualifiers:

- Q-01 Spike recovery and/or RPD is outside acceptance limits.
- Q-23 Recovery of Continuing Calibration Verification sample above upper control limit for this analyte. Data is likely biased high.
- Q-42 Matrix Spike and/or Duplicate analysis was performed on this sample. % Recovery or RPD for this analyte is outside laboratory control limits. (Refer to the QC Section of Analytical Report.)
- TCLP This batch QC sample was prepared with TCLP or SPLP fluid from preparation batch 3090097.

### Notes and Conventions:

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.
- RPD Relative Percent Difference
- MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.
- WMS C Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.
- Batch QC Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.
- Blank Policy Apex assesses blank data for potential high bias down to a level equal to ½ the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.  
  
For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.  
  
Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.
- QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.
- \*\*\* Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

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Darrell Auvil For Darwin Thomas, Business Development Director



# Apex Labs

12232 S.W. Garden Place  
Tigard, OR 97223  
503-718-2323 Phone  
503-718-0333 Fax

Tuesday, October 22, 2013

John Foxwell  
Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

RE: Pier 99 / 1975-01

Enclosed are the results of analyses for work order A3I0420, which was received by the laboratory on 9/19/2013 at 3:25:00PM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: [DAuvil@apex-labs.com](mailto:DAuvil@apex-labs.com), or by phone at 503-718-2323.

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Apex Laboratories



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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

**Reported:**  
10/22/13 10:49

## ANALYTICAL REPORT FOR SAMPLES

### SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
<b>Tank Water</b>	A3I0420-01	Water	09/19/13 09:30	09/19/13 15:25
<b>REX-1 (0-0.5)</b>	A3I0420-02	Soil	09/19/13 10:10	09/19/13 15:25
<b>REX-2 (0-0.5)</b>	A3I0420-03	Soil	09/19/13 10:20	09/19/13 15:25
<b>REX-3 (0-0.5)</b>	A3I0420-04	Soil	09/19/13 10:40	09/19/13 15:25
<b>ASH STOCKPILE</b>	A3I0420-05	Soil	09/19/13 11:05	09/19/13 15:25

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3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 10:49

## ANALYTICAL SAMPLE RESULTS

### Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>Tank Water (A3I0420-01RE1)</b>			<b>Matrix: Water</b>		<b>Batch: 3090476</b>			
Acetone	32.0	---	20.0	ug/L	1	09/20/13 20:31	EPA 8260B	Q-31
Benzene	ND	---	0.250	"	"	"	"	
Bromobenzene	ND	---	0.500	"	"	"	"	
Bromochloromethane	ND	---	1.00	"	"	"	"	
Bromodichloromethane	ND	---	1.00	"	"	"	"	
Bromoform	ND	---	1.00	"	"	"	"	
Bromomethane	ND	---	5.00	"	"	"	"	
2-Butanone (MEK)	ND	---	10.0	"	"	"	"	Q-31
n-Butylbenzene	ND	---	1.00	"	"	"	"	
sec-Butylbenzene	ND	---	1.00	"	"	"	"	
tert-Butylbenzene	ND	---	1.00	"	"	"	"	
Carbon tetrachloride	ND	---	0.500	"	"	"	"	
Chlorobenzene	ND	---	0.500	"	"	"	"	
Chloroethane	ND	---	5.00	"	"	"	"	EST
Chloroform	ND	---	1.00	"	"	"	"	
Chloromethane	ND	---	5.00	"	"	"	"	
2-Chlorotoluene	ND	---	1.00	"	"	"	"	
4-Chlorotoluene	ND	---	1.00	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	---	5.00	"	"	"	"	
Dibromochloromethane	ND	---	1.00	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	---	0.500	"	"	"	"	
Dibromomethane	ND	---	1.00	"	"	"	"	
1,2-Dichlorobenzene	ND	---	0.500	"	"	"	"	
1,3-Dichlorobenzene	ND	---	0.500	"	"	"	"	
1,4-Dichlorobenzene	ND	---	0.500	"	"	"	"	
Dichlorodifluoromethane	ND	---	1.00	"	"	"	"	
1,1-Dichloroethane	ND	---	0.500	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	---	0.500	"	"	"	"	
1,1-Dichloroethene	ND	---	0.500	"	"	"	"	
cis-1,2-Dichloroethene	ND	---	0.500	"	"	"	"	
trans-1,2-Dichloroethene	ND	---	0.500	"	"	"	"	
1,2-Dichloropropane	ND	---	0.500	"	"	"	"	
1,3-Dichloropropane	ND	---	1.00	"	"	"	"	
2,2-Dichloropropane	ND	---	1.00	"	"	"	"	
1,1-Dichloropropene	ND	---	1.00	"	"	"	"	

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Project: **Pier 99**  
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Reported:  
10/22/13 10:49

## ANALYTICAL SAMPLE RESULTS

### Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>Tank Water (A3I0420-01RE1)</b>			<b>Matrix: Water</b>		<b>Batch: 3090476</b>			
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	"	EPA 8260B	
trans-1,3-Dichloropropene	ND	---	1.00	"	"	"	"	
Ethylbenzene	ND	---	0.500	"	"	"	"	
Hexachlorobutadiene	ND	---	5.00	"	"	"	"	
2-Hexanone	ND	---	10.0	"	"	"	"	
Isopropylbenzene	ND	---	1.00	"	"	"	"	
4-Isopropyltoluene	ND	---	1.00	"	"	"	"	
4-Methyl-2-pentanone (MiBK)	ND	---	10.0	"	"	"	"	
Methyl tert-butyl ether (MTBE)	ND	---	1.00	"	"	"	"	
Methylene chloride	ND	---	5.00	"	"	"	"	
Naphthalene	ND	---	2.00	"	"	"	"	
n-Propylbenzene	ND	---	0.500	"	"	"	"	
Styrene	ND	---	1.00	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	---	0.500	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	---	0.500	"	"	"	"	
Tetrachloroethene (PCE)	ND	---	0.500	"	"	"	"	
<b>Toluene</b>	<b>5.71</b>	---	1.00	"	"	"	"	
1,2,3-Trichlorobenzene	ND	---	2.00	"	"	"	"	
1,2,4-Trichlorobenzene	ND	---	2.00	"	"	"	"	
1,1,1-Trichloroethane	ND	---	0.500	"	"	"	"	
1,1,2-Trichloroethane	ND	---	0.500	"	"	"	"	
Trichloroethene (TCE)	ND	---	0.500	"	"	"	"	
Trichlorofluoromethane	ND	---	2.00	"	"	"	"	
1,2,3-Trichloropropane	ND	---	1.00	"	"	"	"	
1,2,4-Trimethylbenzene	ND	---	1.00	"	"	"	"	
1,3,5-Trimethylbenzene	ND	---	1.00	"	"	"	"	
Vinyl chloride	ND	---	0.500	"	"	"	"	
m,p-Xylene	ND	---	1.00	"	"	"	"	
o-Xylene	ND	---	0.500	"	"	"	"	
<i>Surrogate: Dibromofluoromethane (Surr)</i>		<i>Recovery: 92 %</i>		<i>Limits: 80-120 %</i>	"	"	"	
<i>1,4-Difluorobenzene (Surr)</i>		<i>99 %</i>		<i>Limits: 80-120 %</i>	"	"	"	
<i>Toluene-d8 (Surr)</i>		<i>94 %</i>		<i>Limits: 80-120 %</i>	"	"	"	
<i>4-Bromofluorobenzene (Surr)</i>		<i>99 %</i>		<i>Limits: 80-120 %</i>	"	"	"	

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Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 10:49

## ANALYTICAL SAMPLE RESULTS

### Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-1 (0-0.5) (A3I0420-02RE1)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090586</b>			<b>C-07</b>
Aroclor 1016	ND	---	11.0	ug/kg dry	1	09/25/13 14:49	EPA 8082A	
Aroclor 1221	ND	---	11.0	"	"	"	"	
Aroclor 1232	ND	---	11.0	"	"	"	"	
Aroclor 1242	ND	---	11.0	"	"	"	"	
Aroclor 1248	ND	---	11.0	"	"	"	"	
<b>Aroclor 1254</b>	<b>50.8</b>	---	11.0	"	"	"	"	ESTc
<b>Aroclor 1260</b>	<b>34.6</b>	---	11.0	"	"	"	"	ESTc
Aroclor 1262	ND	---	11.0	"	"	"	"	
Aroclor 1268	ND	---	11.0	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl (Surr)</i>			<i>Recovery: 83 %</i>	<i>Limits: 60-125 %</i>	"	"	"	
<b>REX-2 (0-0.5) (A3I0420-03)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090518</b>			<b>C-07</b>
Aroclor 1016	ND	---	10.1	ug/kg dry	1	09/24/13 11:51	EPA 8082A	
Aroclor 1221	ND	---	10.1	"	"	"	"	
Aroclor 1232	ND	---	10.1	"	"	"	"	
Aroclor 1242	ND	---	10.1	"	"	"	"	
Aroclor 1248	ND	---	10.1	"	"	"	"	
<b>Aroclor 1254</b>	<b>18.0</b>	---	10.1	"	"	"	"	ESTa
<b>Aroclor 1260</b>	<b>14.5</b>	---	10.1	"	"	"	"	ESTa
Aroclor 1262	ND	---	10.1	"	"	"	"	
Aroclor 1268	ND	---	10.1	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl (Surr)</i>			<i>Recovery: 74 %</i>	<i>Limits: 60-125 %</i>	"	"	"	
<b>ASH STOCKPILE (A3I0420-05RE1)</b>			<b>Matrix: Soil</b>		<b>Batch: 3100052</b>			<b>C-07</b>
Aroclor 1016	ND	---	106	ug/kg dry	10	10/02/13 17:43	EPA 8082A	
Aroclor 1221	ND	---	106	"	"	"	"	
Aroclor 1232	ND	---	106	"	"	"	"	
Aroclor 1242	ND	---	106	"	"	"	"	
Aroclor 1248	ND	---	106	"	"	"	"	
<b>Aroclor 1254</b>	<b>947</b>	---	106	"	"	"	"	
<b>Aroclor 1260</b>	<b>518</b>	---	106	"	"	"	"	
Aroclor 1262	ND	---	106	"	"	"	"	
Aroclor 1268	ND	---	106	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl (Surr)</i>			<i>Recovery: 90 %</i>	<i>Limits: 60-125 %</i>	"	"	"	

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 10:49

## ANALYTICAL SAMPLE RESULTS

### Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-1 (0-0.5) (A3I0420-02RE1)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090537</b>			<b>C-05</b>
Aldrin	ND	---	22.3	ug/kg dry	5	09/25/13 13:11	EPA 8081B	
alpha-BHC	ND	---	22.3	"	"	"	"	
beta-BHC	ND	---	22.3	"	"	"	"	
delta-BHC	ND	---	22.3	"	"	"	"	
gamma-BHC (Lindane)	ND	---	22.3	"	"	"	"	
cis-Chlordane	ND	---	22.3	"	"	"	"	
trans-Chlordane	ND	---	22.3	"	"	"	"	
<b>4,4'-DDD</b>	<b>35.3</b>	---	22.3	"	"	"	"	
4,4'-DDE	ND	---	22.3	"	"	"	"	
<b>4,4'-DDT</b>	<b>104</b>	---	22.3	"	"	"	"	
Dieldrin	ND	---	22.3	"	"	"	"	
Endosulfan I	ND	---	22.3	"	"	"	"	
Endosulfan II	ND	---	22.3	"	"	"	"	
Endosulfan sulfate	ND	---	22.3	"	"	"	"	
Endrin	ND	---	22.3	"	"	"	"	
Endrin Aldehyde	ND	---	22.3	"	"	"	"	
Endrin ketone	ND	---	22.3	"	"	"	"	
Heptachlor	ND	---	22.3	"	"	"	"	
Heptachlor epoxide	ND	---	22.3	"	"	"	"	
Methoxychlor	ND	---	67.0	"	"	"	"	
Chlordane (Technical)	ND	---	670	"	"	"	"	
Toxaphene (Total)	ND	---	670	"	"	"	"	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 72 %</i>	<i>Limits: 50-125 %</i>	"	"	"	
<i>Decachlorobiphenyl (Surr)</i>			<i>89 %</i>	<i>Limits: 55-130 %</i>	"	"	"	

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 10:49

## ANALYTICAL SAMPLE RESULTS

### Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-2 (0-0.5) (A3I0420-03RE1)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090537</b>		<b>C-05</b>	
Aldrin	ND	---	4.21	ug/kg dry	2	09/25/13 13:46	EPA 8081B	
alpha-BHC	ND	---	4.21	"	"	"	"	
beta-BHC	ND	---	4.21	"	"	"	"	
delta-BHC	ND	---	4.21	"	"	"	"	
gamma-BHC (Lindane)	ND	---	4.21	"	"	"	"	
cis-Chlordane	ND	---	4.21	"	"	"	"	
trans-Chlordane	ND	---	4.21	"	"	"	"	
<b>4,4'-DDD</b>	<b>15.1</b>	---	4.21	"	"	"	"	
4,4'-DDE	ND	---	4.21	"	"	"	"	
<b>4,4'-DDT</b>	<b>4.51</b>	---	4.21	"	"	"	"	
Dieldrin	ND	---	4.21	"	"	"	"	
Endosulfan I	ND	---	4.21	"	"	"	"	
Endosulfan II	ND	---	4.21	"	"	"	"	
Endosulfan sulfate	ND	---	4.21	"	"	"	"	
Endrin	ND	---	4.21	"	"	"	"	
Endrin Aldehyde	ND	---	4.21	"	"	"	"	
Endrin ketone	ND	---	4.21	"	"	"	"	
Heptachlor	ND	---	4.21	"	"	"	"	
Heptachlor epoxide	ND	---	4.21	"	"	"	"	
Methoxychlor	ND	---	12.6	"	"	"	"	
Chlordane (Technical)	ND	---	126	"	"	"	"	
Toxaphene (Total)	ND	---	126	"	"	"	"	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 80 %</i>	<i>Limits: 50-125 %</i>	"	"	"	
<i>Decachlorobiphenyl (Surr)</i>			<i>90 %</i>	<i>Limits: 55-130 %</i>	"	"	"	

Apex Laboratories

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
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Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 10:49

## ANALYTICAL SAMPLE RESULTS

### Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-1 (0-0.5) (A3I0420-02RE1)</b>			<b>Matrix: Soil</b>	<b>Batch: 3090508</b>				
Acenaphthene	ND	---	114	ug/kg dry	10	09/23/13 12:59	EPA 8270D P/P/P	
Acenaphthylene	ND	---	114	"	"	"	"	
Anthracene	ND	---	114	"	"	"	"	
Benz(a)anthracene	ND	---	114	"	"	"	"	
Benzo(a)pyrene	ND	---	171	"	"	"	"	
Benzo(b)fluoranthene	ND	---	171	"	"	"	"	
Benzo(k)fluoranthene	ND	---	171	"	"	"	"	
Benzo(g,h,i)perylene	ND	---	114	"	"	"	"	
<b>Chrysene</b>	<b>136</b>	---	114	"	"	"	"	M-02
Dibenz(a,h)anthracene	ND	---	114	"	"	"	"	
Fluoranthene	ND	---	114	"	"	"	"	
Fluorene	ND	---	114	"	"	"	"	
Indeno(1,2,3-cd)pyrene	ND	---	114	"	"	"	"	
1-Methylnaphthalene	ND	---	228	"	"	"	"	
2-Methylnaphthalene	ND	---	228	"	"	"	"	
Naphthalene	ND	---	228	"	"	"	"	
Phenanthrene	ND	---	114	"	"	"	"	
<b>Pyrene</b>	<b>124</b>	---	114	"	"	"	"	
Carbazole	ND	---	171	"	"	"	"	
Dibenzofuran	ND	---	114	"	"	"	"	
4-Chloro-3-methylphenol	ND	---	1140	"	"	"	"	
2-Chlorophenol	ND	---	570	"	"	"	"	
2,4-Dichlorophenol	ND	---	570	"	"	"	"	
2,4-Dimethylphenol	ND	---	570	"	"	"	"	
2,4-Dinitrophenol	ND	---	2280	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	---	6840	"	"	"	"	
2-Methylphenol	ND	---	285	"	"	"	"	
3+4-Methylphenol(s)	ND	---	285	"	"	"	"	
2-Nitrophenol	ND	---	1140	"	"	"	"	
4-Nitrophenol	ND	---	1140	"	"	"	"	
Pentachlorophenol (PCP)	ND	---	1140	"	"	"	"	
Phenol	ND	---	399	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	---	570	"	"	"	"	
2,4,5-Trichlorophenol	ND	---	570	"	"	"	"	
2,4,6-Trichlorophenol	ND	---	570	"	"	"	"	

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: Pier 99  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 10:49

## ANALYTICAL SAMPLE RESULTS

## Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-1 (0-0.5) (A3I0420-02RE1)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090508</b>			
Bis(2-ethylhexyl)phthalate	ND	---	1140	ug/kg dry	10	"	EPA 8270D P/P/P	
Butyl benzyl phthalate	ND	---	1140	"	"	"	"	
Diethylphthalate	ND	---	1140	"	"	"	"	
Dimethylphthalate	ND	---	1140	"	"	"	"	
Di-n-butylphthalate	ND	---	1140	"	"	"	"	
Di-n-octyl phthalate	ND	---	2280	"	"	"	"	
<i>Surrogate: Nitrobenzene-d5 (Surr)</i>			<i>Recovery: 85 %</i>	<i>Limits: 35-120 %</i>	"	"	"	
<i>2-Fluorobiphenyl (Surr)</i>			<i>88 %</i>	<i>Limits: 45-120 %</i>	"	"	"	
<i>Phenol-d6 (Surr)</i>			<i>93 %</i>	<i>Limits: 40-120 %</i>	"	"	"	
<i>p-Terphenyl-d14 (Surr)</i>			<i>106 %</i>	<i>Limits: 30-125 %</i>	"	"	"	
<i>2-Fluorophenol (Surr)</i>			<i>81 %</i>	<i>Limits: 35-120 %</i>	"	"	"	
<i>2,4,6-Tribromophenol (Surr)</i>			<i>93 %</i>	<i>Limits: 35-125 %</i>	"	"	"	
<b>REX-2 (0-0.5) (A3I0420-03)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090508</b>			
Benzo(g,h,i)perylene	ND	---	171	ug/kg dry	40	09/23/13 13:55	EPA 8270D P/P/P	
Dibenz(a,h)anthracene	ND	---	171	"	"	"	"	
Indeno(1,2,3-cd)pyrene	ND	---	171	"	"	"	"	
<b>REX-2 (0-0.5) (A3I0420-03RE1)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090508</b>			
Acenaphthene	ND	---	17.1	ug/kg dry	4	09/23/13 17:56	EPA 8270D P/P/P	
Acenaphthylene	ND	---	17.1	"	"	"	"	
Anthracene	ND	---	17.1	"	"	"	"	
<b>Benz(a)anthracene</b>	<b>26.8</b>	---	17.1	"	"	"	"	
<b>Benzo(a)pyrene</b>	<b>46.2</b>	---	25.6	"	"	"	"	
<b>Benzo(b)fluoranthene</b>	<b>56.6</b>	---	25.6	"	"	"	"	Q-42
Benzo(k)fluoranthene	ND	---	25.6	"	"	"	"	Q-42
<b>Chrysene</b>	<b>36.4</b>	---	17.1	"	"	"	"	
<b>Fluoranthene</b>	<b>41.3</b>	---	17.1	"	"	"	"	
Fluorene	ND	---	17.1	"	"	"	"	
1-Methylnaphthalene	ND	---	34.1	"	"	"	"	
2-Methylnaphthalene	ND	---	34.1	"	"	"	"	
Naphthalene	ND	---	34.1	"	"	"	"	
<b>Phenanthrene</b>	<b>19.4</b>	---	17.1	"	"	"	"	
<b>Pyrene</b>	<b>44.8</b>	---	17.1	"	"	"	"	
Carbazole	ND	---	25.6	"	"	"	"	Q-42
Dibenzofuran	ND	---	17.1	"	"	"	"	
4-Chloro-3-methylphenol	ND	---	171	"	"	"	"	

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Page 9 of 42

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 10:49

## ANALYTICAL SAMPLE RESULTS

### Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-2 (0-0.5) (A3I0420-03RE1)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090508</b>			
2-Chlorophenol	ND	---	85.4	ug/kg dry	4	"	EPA 8270D P/P/P	
2,4-Dichlorophenol	ND	---	85.4	"	"	"	"	
2,4-Dimethylphenol	ND	---	85.4	"	"	"	"	
2,4-Dinitrophenol	ND	---	341	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	---	1020	"	"	"	"	
2-Methylphenol	ND	---	42.7	"	"	"	"	
3+4-Methylphenol(s)	ND	---	42.7	"	"	"	"	
2-Nitrophenol	ND	---	171	"	"	"	"	
4-Nitrophenol	ND	---	171	"	"	"	"	
Pentachlorophenol (PCP)	ND	---	171	"	"	"	"	
Phenol	ND	---	59.7	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	---	85.4	"	"	"	"	
2,4,5-Trichlorophenol	ND	---	85.4	"	"	"	"	
2,4,6-Trichlorophenol	ND	---	85.4	"	"	"	"	
<b>Bis(2-ethylhexyl)phthalate</b>	<b>207</b>	---	171	"	"	"	"	B-02
Butyl benzyl phthalate	ND	---	171	"	"	"	"	Q-42
Diethylphthalate	ND	---	171	"	"	"	"	
<b>Dimethylphthalate</b>	<b>410</b>	---	171	"	"	"	"	
<b>Di-n-butylphthalate</b>	<b>253</b>	---	171	"	"	"	"	B-02, Q-42
Di-n-octyl phthalate	ND	---	341	"	"	"	"	Q-42
<i>Surrogate: Nitrobenzene-d5 (Surr)</i>			<i>Recovery: 72 %</i>	<i>Limits: 35-120 %</i>	"	"	"	
<i>2-Fluorobiphenyl (Surr)</i>			<i>76 %</i>	<i>Limits: 45-120 %</i>	"	"	"	
<i>Phenol-d6 (Surr)</i>			<i>92 %</i>	<i>Limits: 40-120 %</i>	"	"	"	
<i>p-Terphenyl-d14 (Surr)</i>			<i>104 %</i>	<i>Limits: 30-125 %</i>	"	"	"	
<i>2-Fluorophenol (Surr)</i>			<i>73 %</i>	<i>Limits: 35-120 %</i>	"	"	"	
<i>2,4,6-Tribromophenol (Surr)</i>			<i>98 %</i>	<i>Limits: 35-125 %</i>	"	"	"	

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 10:49

## ANALYTICAL SAMPLE RESULTS

## Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-1 (0-0.5) (A3I0420-02)</b> <b>Matrix: Soil</b>								
Batch: 3090527								
Antimony	2.20	0.567	1.13	mg/kg dry	10	09/24/13 17:43	EPA 6020A	
Cadmium	3.00	0.113	0.227	"	"	"	"	
Chromium	28.6	0.567	1.13	"	"	"	"	
Copper	1460	0.567	1.13	"	"	"	"	
Lead	129	0.113	0.227	"	"	"	"	
Nickel	22.3	0.567	1.13	"	"	"	"	
Zinc	741	2.27	4.54	"	"	"	"	
<b>REX-2 (0-0.5) (A3I0420-03)</b> <b>Matrix: Soil</b>								
Batch: 3090527								
Antimony	ND	0.537	1.07	mg/kg dry	10	09/24/13 17:46	EPA 6020A	
Cadmium	2.15	0.107	0.215	"	"	"	"	
Chromium	14.5	0.537	1.07	"	"	"	"	
Copper	393	0.537	1.07	"	"	"	"	
Lead	56.0	0.107	0.215	"	"	"	"	
Nickel	13.7	0.537	1.07	"	"	"	"	
Zinc	276	2.15	4.29	"	"	"	"	
<b>REX-3 (0-0.5) (A3I0420-04)</b> <b>Matrix: Soil</b>								
Batch: 3090527								
Antimony	ND	0.533	1.07	mg/kg dry	10	09/24/13 17:49	EPA 6020A	
Cadmium	0.256	0.107	0.213	"	"	"	"	
Chromium	7.02	0.533	1.07	"	"	"	"	
Copper	22.1	0.533	1.07	"	"	"	"	
Lead	12.6	0.107	0.213	"	"	"	"	
Nickel	8.73	0.533	1.07	"	"	"	"	
Zinc	45.5	2.13	4.26	"	"	"	"	
<b>ASH STOCKPILE (A3I0420-05)</b> <b>Matrix: Soil</b>								
Batch: 3090527								
Arsenic	31.3	---	1.14	mg/kg dry	10	09/24/13 17:51	EPA 6020A	
Barium	931	---	1.14	"	"	"	"	
Cadmium	12.6	0.114	0.229	"	"	"	"	
Chromium	78.6	0.572	1.14	"	"	"	"	
Lead	3400	1.14	2.29	"	100	09/25/13 10:47	"	
Mercury	0.803	---	0.0915	"	10	09/24/13 17:51	"	
Selenium	ND	---	1.14	"	"	"	"	

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Page 11 of 42

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Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 10:49

## ANALYTICAL SAMPLE RESULTS

### Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>ASH STOCKPILE (A3I0420-05)</b>			<b>Matrix: Soil</b>					
Silver	2.65	---	0.229	mg/kg dry	10	"	EPA 6020A	

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Apex Companies, LLC  
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Reported:  
10/22/13 10:49

## ANALYTICAL SAMPLE RESULTS

### TCLP Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
ASH STOCKPILE (A3I0420-05)			Matrix: Soil					
Batch: 3090622								
Arsenic	ND	---	0.100	mg/L	5	09/26/13 13:50	1311/6020A	Q-44
Barium	1.40	---	0.500	"	"	"	"	Q-44
Cadmium	0.0725	---	0.0500	"	"	"	"	Q-44
Chromium	ND	---	0.100	"	"	"	"	Q-44
Lead	32.5	---	0.0500	"	"	"	"	Q-44
Mercury	ND	---	0.00400	"	"	"	"	Q-44
Selenium	ND	---	0.100	"	"	"	"	Q-44
Silver	ND	---	0.0500	"	"	"	"	Q-44

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Page 13 of 42

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3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 10:49

## ANALYTICAL SAMPLE RESULTS

Percent Dry Weight								
Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-1 (0-0.5) (A3I0420-02)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090540</b>			
% Solids	86.3	---	1.00	% by Weight	1	09/24/13 09:53	NWTPH-Dx	
<b>REX-2 (0-0.5) (A3I0420-03)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090540</b>			
% Solids	91.0	---	1.00	% by Weight	1	09/24/13 09:53	NWTPH-Dx	
<b>REX-3 (0-0.5) (A3I0420-04)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090540</b>			
% Solids	96.3	---	1.00	% by Weight	1	09/24/13 09:53	NWTPH-Dx	
<b>ASH STOCKPILE (A3I0420-05)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090540</b>			
% Solids	88.3	---	1.00	% by Weight	1	09/24/13 09:53	NWTPH-Dx	

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090476 - EPA 5030B						Water						
Blank (3090476-BLK1)				Prepared: 09/20/13 09:00    Analyzed: 09/20/13 12:46								
EPA 8260B												
Acetone	ND	---	20.0	ug/L	1	---	---	---	---	---	---	Q-31
Benzene	ND	---	0.250	"	"	---	---	---	---	---	---	
Bromobenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
Bromochloromethane	ND	---	1.00	"	"	---	---	---	---	---	---	
Bromodichloromethane	ND	---	1.00	"	"	---	---	---	---	---	---	
Bromoform	ND	---	1.00	"	"	---	---	---	---	---	---	
Bromomethane	ND	---	5.00	"	"	---	---	---	---	---	---	
2-Butanone (MEK)	ND	---	10.0	"	"	---	---	---	---	---	---	Q-31
n-Butylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
sec-Butylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
tert-Butylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
Carbon tetrachloride	ND	---	0.500	"	"	---	---	---	---	---	---	
Chlorobenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
Chloroethane	ND	---	5.00	"	"	---	---	---	---	---	---	EST
Chloroform	ND	---	1.00	"	"	---	---	---	---	---	---	
Chloromethane	ND	---	5.00	"	"	---	---	---	---	---	---	
2-Chlorotoluene	ND	---	1.00	"	"	---	---	---	---	---	---	
4-Chlorotoluene	ND	---	1.00	"	"	---	---	---	---	---	---	
1,2-Dibromo-3-chloroprop ane	ND	---	5.00	"	"	---	---	---	---	---	---	
Dibromochloromethane	ND	---	1.00	"	"	---	---	---	---	---	---	
1,2-Dibromoethane (EDB)	ND	---	0.500	"	"	---	---	---	---	---	---	
Dibromomethane	ND	---	1.00	"	"	---	---	---	---	---	---	
1,2-Dichlorobenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
1,3-Dichlorobenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
1,4-Dichlorobenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
Dichlorodifluoromethane	ND	---	1.00	"	"	---	---	---	---	---	---	
1,1-Dichloroethane	ND	---	0.500	"	"	---	---	---	---	---	---	
1,2-Dichloroethane (EDC)	ND	---	0.500	"	"	---	---	---	---	---	---	
1,1-Dichloroethene	ND	---	0.500	"	"	---	---	---	---	---	---	

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## Apex Companies, LLC

3015 SW First Avenue  
Portland, OR 97201

Project: Pier 99

Project Number: 1975-01

Project Manager: John Foxwell

Reported:

10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3090476 - EPA 5030B</b>						<b>Water</b>						
<b>Blank (3090476-BLK1)</b>						Prepared: 09/20/13 09:00 Analyzed: 09/20/13 12:46						
cis-1,2-Dichloroethene	ND	---	0.500	ug/L	"	---	---	---	---	---	---	
trans-1,2-Dichloroethene	ND	---	0.500	"	"	---	---	---	---	---	---	
1,2-Dichloropropane	ND	---	0.500	"	"	---	---	---	---	---	---	
1,3-Dichloropropane	ND	---	1.00	"	"	---	---	---	---	---	---	
2,2-Dichloropropane	ND	---	1.00	"	"	---	---	---	---	---	---	
1,1-Dichloropropene	ND	---	1.00	"	"	---	---	---	---	---	---	
cis-1,3-Dichloropropene	ND	---	1.00	"	"	---	---	---	---	---	---	
trans-1,3-Dichloropropene	ND	---	1.00	"	"	---	---	---	---	---	---	
Ethylbenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
Hexachlorobutadiene	ND	---	5.00	"	"	---	---	---	---	---	---	
2-Hexanone	ND	---	10.0	"	"	---	---	---	---	---	---	
Isopropylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
4-Isopropyltoluene	ND	---	1.00	"	"	---	---	---	---	---	---	
4-Methyl-2-pentanone (MiBK)	ND	---	10.0	"	"	---	---	---	---	---	---	
Methyl tert-butyl ether (MTBE)	ND	---	1.00	"	"	---	---	---	---	---	---	
Methylene chloride	ND	---	5.00	"	"	---	---	---	---	---	---	
Naphthalene	ND	---	2.00	"	"	---	---	---	---	---	---	
n-Propylbenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
Styrene	ND	---	1.00	"	"	---	---	---	---	---	---	
1,1,1,2-Tetrachloroethane	ND	---	0.500	"	"	---	---	---	---	---	---	
1,1,2,2-Tetrachloroethane	ND	---	0.500	"	"	---	---	---	---	---	---	
Tetrachloroethene (PCE)	ND	---	0.500	"	"	---	---	---	---	---	---	
Toluene	ND	---	1.00	"	"	---	---	---	---	---	---	
1,2,3-Trichlorobenzene	ND	---	2.00	"	"	---	---	---	---	---	---	
1,2,4-Trichlorobenzene	ND	---	2.00	"	"	---	---	---	---	---	---	
1,1,1-Trichloroethane	ND	---	0.500	"	"	---	---	---	---	---	---	
1,1,2-Trichloroethane	ND	---	0.500	"	"	---	---	---	---	---	---	
Trichloroethene (TCE)	ND	---	0.500	"	"	---	---	---	---	---	---	
Trichlorofluoromethane	ND	---	2.00	"	"	---	---	---	---	---	---	
1,2,3-Trichloropropane	ND	---	1.00	"	"	---	---	---	---	---	---	

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## Apex Companies, LLC

3015 SW First Avenue  
Portland, OR 97201

Project: Pier 99

Project Number: 1975-01

Project Manager: John Foxwell

Reported:

10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3090476 - EPA 5030B</b>						<b>Water</b>						
<b>Blank (3090476-BLK1)</b>						Prepared: 09/20/13 09:00 Analyzed: 09/20/13 12:46						
1,2,4-Trimethylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
1,3,5-Trimethylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
Vinyl chloride	ND	---	0.500	"	"	---	---	---	---	---	---	
m,p-Xylene	ND	---	1.00	"	"	---	---	---	---	---	---	
o-Xylene	ND	---	0.500	"	"	---	---	---	---	---	---	
<i>Surr: Dibromofluoromethane (Surr)</i>			<i>Recovery: 83 %</i>	<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>1,4-Difluorobenzene (Surr)</i>			<i>91 %</i>	<i>80-120 %</i>		<i>"</i>						
<i>Toluene-d8 (Surr)</i>			<i>97 %</i>	<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>			<i>97 %</i>	<i>80-120 %</i>		<i>"</i>						

## LCS (3090476-BS1)

Prepared: 09/20/13 09:00 Analyzed: 09/20/13 11:54

## EPA 8260B

Acetone	34.5	---	20.0	ug/L	1	40.0	---	86	70-130%	---	---	Q-31
Benzene	17.6	---	0.250	"	"	20.0	---	88	"	---	---	
Bromobenzene	22.7	---	0.500	"	"	"	---	113	"	---	---	
Bromochloromethane	16.6	---	1.00	"	"	"	---	83	"	---	---	
Bromodichloromethane	17.4	---	1.00	"	"	"	---	87	"	---	---	
Bromoform	20.9	---	1.00	"	"	"	---	104	"	---	---	
Bromomethane	15.6	---	5.00	"	"	"	---	78	"	---	---	
2-Butanone (MEK)	32.0	---	10.0	"	"	40.0	---	80	"	---	---	Q-31
n-Butylbenzene	21.8	---	1.00	"	"	20.0	---	109	"	---	---	
sec-Butylbenzene	21.7	---	1.00	"	"	"	---	108	"	---	---	
tert-Butylbenzene	21.6	---	1.00	"	"	"	---	108	"	---	---	
Carbon tetrachloride	17.7	---	0.500	"	"	"	---	88	"	---	---	
Chlorobenzene	21.4	---	0.500	"	"	"	---	107	"	---	---	
Chloroethane	11.2	---	5.00	"	"	"	---	56	"	---	---	EST
Chloroform	18.2	---	1.00	"	"	"	---	91	"	---	---	
Chloromethane	15.5	---	5.00	"	"	"	---	77	"	---	---	
2-Chlorotoluene	22.4	---	1.00	"	"	"	---	112	"	---	---	
4-Chlorotoluene	20.7	---	1.00	"	"	"	---	104	"	---	---	
1,2-Dibromo-3-chloroprop ane	20.1	---	5.00	"	"	"	---	100	"	---	---	

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Darrell Auvil For Darwin Thomas, Business Development Director

Page 17 of 42

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3090476 - EPA 5030B</b>						<b>Water</b>						
<b>LCS (3090476-BS1)</b>						Prepared: 09/20/13 09:00 Analyzed: 09/20/13 11:54						
Dibromochloromethane	20.5	---	1.00	ug/L	"	"	---	103	"	---	---	
1,2-Dibromoethane (EDB)	20.8	---	0.500	"	"	"	---	104	"	---	---	
Dibromomethane	17.9	---	1.00	"	"	"	---	90	"	---	---	
1,2-Dichlorobenzene	22.1	---	0.500	"	"	"	---	110	"	---	---	
1,3-Dichlorobenzene	22.6	---	0.500	"	"	"	---	113	"	---	---	
1,4-Dichlorobenzene	21.2	---	0.500	"	"	"	---	106	"	---	---	
Dichlorodifluoromethane	14.8	---	1.00	"	"	"	---	74	"	---	---	
1,1-Dichloroethane	17.2	---	0.500	"	"	"	---	86	"	---	---	
1,2-Dichloroethane (EDC)	16.1	---	0.500	"	"	"	---	80	"	---	---	
1,1-Dichloroethene	16.2	---	0.500	"	"	"	---	81	"	---	---	
cis-1,2-Dichloroethene	18.6	---	0.500	"	"	"	---	93	"	---	---	
trans-1,2-Dichloroethene	17.4	---	0.500	"	"	"	---	87	"	---	---	
1,2-Dichloropropane	17.8	---	0.500	"	"	"	---	89	"	---	---	
1,3-Dichloropropane	20.8	---	1.00	"	"	"	---	104	"	---	---	
2,2-Dichloropropane	16.9	---	1.00	"	"	"	---	84	"	---	---	
1,1-Dichloropropene	15.7	---	1.00	"	"	"	---	79	"	---	---	
cis-1,3-Dichloropropene	18.8	---	1.00	"	"	"	---	94	"	---	---	
trans-1,3-Dichloropropene	20.1	---	1.00	"	"	"	---	101	"	---	---	
Ethylbenzene	21.0	---	0.500	"	"	"	---	105	"	---	---	
Hexachlorobutadiene	21.9	---	5.00	"	"	"	---	109	"	---	---	
2-Hexanone	36.7	---	10.0	"	"	40.0	---	92	"	---	---	
Isopropylbenzene	21.5	---	1.00	"	"	20.0	---	107	"	---	---	
4-Isopropyltoluene	22.2	---	1.00	"	"	"	---	111	"	---	---	
4-Methyl-2-pentanone (MiBK)	37.1	---	10.0	"	"	40.0	---	93	"	---	---	
Methyl tert-butyl ether (MTBE)	17.3	---	1.00	"	"	20.0	---	87	"	---	---	
Methylene chloride	17.4	---	5.00	"	"	"	---	87	"	---	---	
Naphthalene	23.0	---	2.00	"	"	"	---	115	"	---	---	
n-Propylbenzene	21.2	---	0.500	"	"	"	---	106	"	---	---	
Styrene	21.1	---	1.00	"	"	"	---	105	"	---	---	
1,1,1,2-Tetrachloroethane	20.8	---	0.500	"	"	"	---	104	"	---	---	

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3090476 - EPA 5030B</b>						<b>Water</b>						
<b>LCS (3090476-BS1)</b>						Prepared: 09/20/13 09:00 Analyzed: 09/20/13 11:54						
1,1,2,2-Tetrachloroethane	20.2	---	0.500	"	"	"	---	101	"	---	---	
Tetrachloroethene (PCE)	22.9	---	0.500	"	"	"	---	114	"	---	---	
Toluene	20.8	---	1.00	"	"	"	---	104	"	---	---	
1,2,3-Trichlorobenzene	21.9	---	2.00	"	"	"	---	110	"	---	---	
1,2,4-Trichlorobenzene	22.6	---	2.00	"	"	"	---	113	"	---	---	
1,1,1-Trichloroethane	17.7	---	0.500	"	"	"	---	89	"	---	---	
1,1,2-Trichloroethane	21.2	---	0.500	"	"	"	---	106	"	---	---	
Trichloroethene (TCE)	18.5	---	0.500	"	"	"	---	93	"	---	---	
Trichlorofluoromethane	15.5	---	2.00	"	"	"	---	77	"	---	---	
1,2,3-Trichloropropane	19.8	---	1.00	"	"	"	---	99	"	---	---	
1,2,4-Trimethylbenzene	21.4	---	1.00	"	"	"	---	107	"	---	---	
1,3,5-Trimethylbenzene	21.7	---	1.00	"	"	"	---	108	"	---	---	
Vinyl chloride	16.6	---	0.500	"	"	"	---	83	"	---	---	
m,p-Xylene	42.5	---	1.00	"	"	40.0	---	106	"	---	---	
o-Xylene	20.9	---	0.500	"	"	20.0	---	105	"	---	---	
<i>Surr: Dibromofluoromethane (Surr)</i>			<i>Recovery: 83 %</i>	<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>1,4-Difluorobenzene (Surr)</i>			<i>93 %</i>	<i>80-120 %</i>		<i>"</i>						
<i>Toluene-d8 (Surr)</i>			<i>97 %</i>	<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>			<i>97 %</i>	<i>80-120 %</i>		<i>"</i>						

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090518 - EPA 3546						Soil						
Blank (3090518-BLK1)			Prepared: 09/23/13 10:00				Analyzed: 09/24/13 09:57				C-07	
EPA 8082A												
Aroclor 1016	ND	---	7.69	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1221	ND	---	7.69	"	"	---	---	---	---	---	---	
Aroclor 1232	ND	---	7.69	"	"	---	---	---	---	---	---	
Aroclor 1242	ND	---	7.69	"	"	---	---	---	---	---	---	
Aroclor 1248	ND	---	7.69	"	"	---	---	---	---	---	---	
Aroclor 1254	ND	---	7.69	"	"	---	---	---	---	---	---	
Aroclor 1260	ND	---	7.69	"	"	---	---	---	---	---	---	
Aroclor 1262	ND	---	7.69	"	"	---	---	---	---	---	---	
Aroclor 1268	ND	---	7.69	"	"	---	---	---	---	---	---	
Surr: Decachlorobiphenyl (Surr)		Recovery: 97 %		Limits: 60-125 %		Dilution: 1x						
LCS (3090518-BS1)			Prepared: 09/23/13 10:00				Analyzed: 09/24/13 10:15				C-07	
EPA 8082A												
Aroclor 1016	284	---	10.0	ug/kg wet	1	250	---	114	40-140%	---	---	
Aroclor 1260	245	---	10.0	"	"	"	---	98	60-130%	---	---	
Surr: Decachlorobiphenyl (Surr)		Recovery: 103 %		Limits: 60-125 %		Dilution: 1x						
Matrix Spike (3090518-MS1)			Prepared: 09/23/13 10:00				Analyzed: 09/24/13 12:09				C-07	
QC Source Sample: REX-2 (0-0.5) (A3I0420-03)												
EPA 8082A												
Aroclor 1016	178	---	9.57	ug/kg dry	1	239	ND	74	40-140%	---	---	
Aroclor 1260	168	---	9.57	"	"	"	14.5	64	60-130%	---	---	
Surr: Decachlorobiphenyl (Surr)		Recovery: 67 %		Limits: 60-125 %		Dilution: 1x						

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090586 - EPA 3546						Soil						
Blank (3090586-BLK1)			Prepared: 09/25/13 10:29    Analyzed: 09/25/13 14:49					C-07				
EPA 8082A												
Aroclor 1016	ND	---	8.33	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1221	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1232	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1242	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1248	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1254	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1260	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1262	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1268	ND	---	8.33	"	"	---	---	---	---	---	---	
Surr: Decachlorobiphenyl (Surr)		Recovery: 108 %		Limits: 60-125 %		Dilution: 1x						
LCS (3090586-BS1)			Prepared: 09/25/13 10:29    Analyzed: 09/25/13 15:07					C-07				
EPA 8082A												
Aroclor 1016	213	---	10.0	ug/kg wet	1	250	---	85	40-140%	---	---	
Aroclor 1260	203	---	10.0	"	"	"	---	81	60-130%	---	---	
Surr: Decachlorobiphenyl (Surr)		Recovery: 106 %		Limits: 60-125 %		Dilution: 1x						
Matrix Spike (3090586-MS1)			Prepared: 09/25/13 10:29    Analyzed: 09/25/13 15:07					C-07				
QC Source Sample: REX-1 (0-0.5) (A3I0420-02RE1)												
EPA 8082A												
Aroclor 1016	173	---	9.82	ug/kg dry	1	245	ND	71	40-140%	---	---	
Aroclor 1260	196	---	9.82	"	"	"	34.6	66	60-130%	---	---	
Surr: Decachlorobiphenyl (Surr)		Recovery: 80 %		Limits: 60-125 %		Dilution: 1x						

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3100052 - EPA 3546						Soil						
Blank (3100052-BLK1)						Prepared: 10/02/13 08:21		Analyzed: 10/02/13 15:54				C-07
EPA 8082A												
Aroclor 1016	ND	---	8.33	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1221	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1232	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1242	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1248	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1254	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1260	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1262	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1268	ND	---	8.33	"	"	---	---	---	---	---	---	
Surr: Decachlorobiphenyl (Surr)		Recovery: 105 %		Limits: 60-125 %		Dilution: 1x		Q-23				
LCS (3100052-BS1)						Prepared: 10/02/13 08:21		Analyzed: 10/02/13 16:12				C-07
EPA 8082A												
Aroclor 1016	224	---	10.0	ug/kg wet	1	250	---	90	40-140%	---	---	
Aroclor 1260	238	---	10.0	"	"	"	---	95	60-130%	---	---	
Surr: Decachlorobiphenyl (Surr)		Recovery: 110 %		Limits: 60-125 %		Dilution: 1x		Q-23				

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090537 - EPA 3546/3640A (GPC)						Soil						
Blank (3090537-BLK1)				Prepared: 09/23/13 07:45		Analyzed: 09/25/13 12:35					C-05	
EPA 8081B												
Aldrin	ND	---	1.82	ug/kg wet	1	---	---	---	---	---	---	
alpha-BHC	ND	---	1.82	"	"	---	---	---	---	---	---	
beta-BHC	ND	---	1.82	"	"	---	---	---	---	---	---	
delta-BHC	ND	---	1.82	"	"	---	---	---	---	---	---	
gamma-BHC (Lindane)	ND	---	1.82	"	"	---	---	---	---	---	---	
cis-Chlordane	ND	---	1.82	"	"	---	---	---	---	---	---	
trans-Chlordane	ND	---	1.82	"	"	---	---	---	---	---	---	
4,4'-DDD	ND	---	1.82	"	"	---	---	---	---	---	---	
4,4'-DDE	ND	---	1.82	"	"	---	---	---	---	---	---	
4,4'-DDT	ND	---	1.82	"	"	---	---	---	---	---	---	
Dieldrin	ND	---	1.82	"	"	---	---	---	---	---	---	
Endosulfan I	ND	---	1.82	"	"	---	---	---	---	---	---	
Endosulfan II	ND	---	1.82	"	"	---	---	---	---	---	---	
Endosulfan sulfate	ND	---	1.82	"	"	---	---	---	---	---	---	
Endrin	ND	---	1.82	"	"	---	---	---	---	---	---	
Endrin Aldehyde	ND	---	1.82	"	"	---	---	---	---	---	---	
Endrin ketone	ND	---	1.82	"	"	---	---	---	---	---	---	
Heptachlor	ND	---	1.82	"	"	---	---	---	---	---	---	
Heptachlor epoxide	ND	---	1.82	"	"	---	---	---	---	---	---	
Methoxychlor	ND	---	5.45	"	"	---	---	---	---	---	---	
Chlordane (Technical)	ND	---	54.5	"	"	---	---	---	---	---	---	
Toxaphene (Total)	ND	---	54.5	"	"	---	---	---	---	---	---	
Surr: 2,4,5,6-TCMX (Surr)		Recovery: 68 %		Limits: 50-125 %		Dilution: 1x						
Decachlorobiphenyl (Surr)		101 %		55-130 %		"						

**LCS (3090537-BS1)**

Prepared: 09/23/13 07:45 Analyzed: 09/25/13 12:53

**C-05**

<b>EPA 8081B</b>												
Aldrin	41.6	---	2.00	ug/kg wet	1	50.0	---	83	45-140%	---	---	
alpha-BHC	40.7	---	2.00	"	"	"	---	81	60-125%	---	---	
beta-BHC	43.4	---	2.00	"	"	"	---	87	"	---	---	
delta-BHC	46.0	---	2.00	"	"	"	---	92	55-130%	---	---	

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090537 - EPA 3546/3640A (GPC)							Soil					
LCS (3090537-BS1)				Prepared: 09/23/13 07:45		Analyzed: 09/25/13 12:53					C-05	
gamma-BHC (Lindane)	42.9	---	2.00	"	"	"	---	86	60-125%	---	---	
cis-Chlordane	50.6	---	2.00	"	"	"	---	101	60-120%	---	---	
trans-Chlordane	50.9	---	2.00	"	"	"	---	102	65-125%	---	---	
4,4'-DDD	55.0	---	2.00	"	"	"	---	110	30-135%	---	---	
4,4'-DDE	50.0	---	2.00	"	"	"	---	100	70-125%	---	---	
4,4'-DDT	69.5	---	2.00	"	"	"	---	139	45-140%	---	---	
Dieldrin	52.9	---	2.00	"	"	"	---	106	65-125%	---	---	
Endosulfan I	53.9	---	2.00	"	"	"	---	108	15-135%	---	---	
Endosulfan II	52.8	---	2.00	"	"	"	---	106	35-140%	---	---	
Endosulfan sulfate	56.1	---	2.00	"	"	"	---	112	60-135%	---	---	
Endrin	53.0	---	2.00	"	"	"	---	106	"	---	---	
Endrin Aldehyde	50.2	---	2.00	"	"	"	---	100	30-145%	---	---	
Endrin ketone	56.8	---	2.00	"	"	"	---	114	65-135%	---	---	
Heptachlor	49.0	---	2.00	"	"	"	---	98	50-140%	---	---	
Heptachlor epoxide	51.4	---	2.00	"	"	"	---	103	65-130%	---	---	
Methoxychlor	67.0	---	6.00	"	"	"	---	134	55-145%	---	---	

Surr: 2,4,5,6-TCMX (Surr)

Recovery: 64 %

Limits: 50-125 %

Dilution: 1x

Decachlorobiphenyl (Surr)

98 %

55-130 %

"

## Duplicate (3090537-DUP1)

Prepared: 09/23/13 07:45 Analyzed: 09/25/13 13:28

C-05

## QC Source Sample: REX-1 (0-0.5) (A310420-02RE1)

## EPA 8081B

Aldrin	ND	---	22.0	ug/kg dry	5	---	ND	---	---	---	30%	
alpha-BHC	ND	---	22.0	"	"	---	ND	---	---	---	30%	
beta-BHC	ND	---	22.0	"	"	---	ND	---	---	---	30%	
delta-BHC	ND	---	22.0	"	"	---	ND	---	---	---	30%	
gamma-BHC (Lindane)	ND	---	22.0	"	"	---	ND	---	---	---	30%	
cis-Chlordane	ND	---	22.0	"	"	---	ND	---	---	---	30%	
trans-Chlordane	ND	---	22.0	"	"	---	ND	---	---	---	30%	
4,4'-DDD	<b>34.4</b>	---	22.0	"	"	---	35.3	---	---	2	30%	
4,4'-DDE	ND	---	22.0	"	"	---	ND	---	---	---	30%	
4,4'-DDT	ND	---	22.0	"	"	---	104	---	---	***	30%	Q-04

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3015 SW First Avenue  
Portland, OR 97201Project: Pier 99  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090537 - EPA 3546/3640A (GPC)							Soil					
Duplicate (3090537-DUP1)				Prepared: 09/23/13 07:45		Analyzed: 09/25/13 13:28					C-05	
QC Source Sample: REX-1 (0-0.5) (A3I0420-02RE1)												
Dieldrin	ND	---	22.0	"	"	---	ND	---	---	---	30%	
Endosulfan I	ND	---	22.0	"	"	---	ND	---	---	---	30%	
Endosulfan II	ND	---	22.0	"	"	---	ND	---	---	---	30%	
Endosulfan sulfate	ND	---	22.0	"	"	---	ND	---	---	---	30%	
Endrin	ND	---	22.0	"	"	---	ND	---	---	---	30%	
Endrin Aldehyde	ND	---	22.0	"	"	---	ND	---	---	---	30%	
Endrin ketone	ND	---	22.0	"	"	---	ND	---	---	---	30%	
Heptachlor	ND	---	22.0	"	"	---	ND	---	---	---	30%	
Heptachlor epoxide	ND	---	22.0	"	"	---	ND	---	---	---	30%	
Methoxychlor	ND	---	66.0	"	"	---	ND	---	---	---	30%	
Chlordane (Technical)	ND	---	660	"	"	---	ND	---	---	---	30%	
Toxaphene (Total)	ND	---	660	"	"	---	ND	---	---	---	30%	
Surr: 2,4,5,6-TCMX (Surr)		Recovery: 78 %		Limits: 50-125 %		Dilution: 5x						
Decachlorobiphenyl (Surr)		89 %		55-130 %		"						

Matrix Spike (3090537-MS1)					Prepared: 09/23/13 07:45		Analyzed: 09/25/13 14:04		C-05		
QC Source Sample: REX-2 (0-0.5) (A3I0420-03RE1)											
EPA 8081B											
Aldrin	52.1	---	4.31	ug/kg dry	2	53.9	ND	97	45-140%	---	---
alpha-BHC	54.8	---	4.31	"	"	"	ND	102	60-125%	---	---
beta-BHC	55.5	---	4.31	"	"	"	ND	103	"	---	---
delta-BHC	54.4	---	4.31	"	"	"	ND	101	55-130%	---	---
gamma-BHC (Lindane)	55.0	---	4.31	"	"	"	ND	102	60-125%	---	---
cis-Chlordane	53.3	---	4.31	"	"	"	ND	99	65-120%	---	---
trans-Chlordane	53.7	---	4.31	"	"	"	ND	100	65-125%	---	---
4,4'-DDD	64.4	---	4.31	"	"	"	15.1	91	30-135%	---	---
4,4'-DDE	53.2	---	4.31	"	"	"	ND	99	70-125%	---	---
4,4'-DDT	68.8	---	4.31	"	"	"	4.51	119	45-140%	---	---
Dieldrin	55.9	---	4.31	"	"	"	ND	104	65-125%	---	---
Endosulfan I	58.6	---	4.31	"	"	"	ND	109	15-135%	---	---

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Page 25 of 42

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090537 - EPA 3546/3640A (GPC)							Soil					
Matrix Spike (3090537-MS1)				Prepared: 09/23/13 07:45		Analyzed: 09/25/13 14:04					C-05	
QC Source Sample: REX-2 (0-0.5) (A3I0420-03RE1)												
Endosulfan II	51.6	---	4.31	ug/kg dry	"	"	ND	96	35-140%	---	---	
Endosulfan sulfate	52.1	---	4.31	"	"	"	ND	97	60-135%	---	---	
Endrin	58.7	---	4.31	"	"	"	ND	109	"	---	---	
Endrin Aldehyde	48.3	---	4.31	"	"	"	ND	90	35-145%	---	---	
Endrin ketone	51.8	---	4.31	"	"	"	ND	96	65-135%	---	---	
Heptachlor	61.6	---	4.31	"	"	"	ND	114	50-140%	---	---	
Heptachlor epoxide	58.6	---	4.31	"	"	"	ND	109	65-130%	---	---	
Methoxychlor	69.3	---	12.9	"	"	"	ND	129	55-145%	---	---	
Surr: 2,4,5,6-TCMX (Surr)		Recovery: 78 %		Limits: 50-125 %		Dilution: 2x						
Decachlorobiphenyl (Surr)		81 %		55-130 %		"						

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090508 - EPA 3546						Soil						
Blank (3090508-BLK1)				Prepared: 09/23/13 07:40    Analyzed: 09/23/13 12:42								
EPA 8270D P/P/P												
Acenaphthene	ND	---	3.64	ug/kg wet	1	---	---	---	---	---	---	
Acenaphthylene	ND	---	3.64	"	"	---	---	---	---	---	---	
Anthracene	ND	---	3.64	"	"	---	---	---	---	---	---	
Benz(a)anthracene	ND	---	3.64	"	"	---	---	---	---	---	---	
Benzo(a)pyrene	ND	---	5.45	"	"	---	---	---	---	---	---	
Benzo(b)fluoranthene	ND	---	5.45	"	"	---	---	---	---	---	---	
Benzo(k)fluoranthene	ND	---	5.45	"	"	---	---	---	---	---	---	
Benzo(b+k)fluoranthene(s)	ND	---	10.9	"	"	---	---	---	---	---	---	
Benzo(g,h,i)perylene	ND	---	3.64	"	"	---	---	---	---	---	---	
Chrysene	ND	---	3.64	"	"	---	---	---	---	---	---	
Dibenz(a,h)anthracene	ND	---	3.64	"	"	---	---	---	---	---	---	
Fluoranthene	ND	---	3.64	"	"	---	---	---	---	---	---	
Fluorene	ND	---	3.64	"	"	---	---	---	---	---	---	
Indeno(1,2,3-cd)pyrene	ND	---	3.64	"	"	---	---	---	---	---	---	
1-Methylnaphthalene	ND	---	7.27	"	"	---	---	---	---	---	---	
2-Methylnaphthalene	ND	---	7.27	"	"	---	---	---	---	---	---	
Naphthalene	ND	---	7.27	"	"	---	---	---	---	---	---	
Phenanthrene	ND	---	3.64	"	"	---	---	---	---	---	---	
Pyrene	ND	---	3.64	"	"	---	---	---	---	---	---	
Carbazole	ND	---	5.45	"	"	---	---	---	---	---	---	
Dibenzofuran	ND	---	3.64	"	"	---	---	---	---	---	---	
4-Chloro-3-methylphenol	ND	---	36.4	"	"	---	---	---	---	---	---	
2-Chlorophenol	ND	---	18.2	"	"	---	---	---	---	---	---	
2,4-Dichlorophenol	ND	---	18.2	"	"	---	---	---	---	---	---	
2,4-Dimethylphenol	ND	---	18.2	"	"	---	---	---	---	---	---	
2,4-Dinitrophenol	ND	---	72.7	"	"	---	---	---	---	---	---	
4,6-Dinitro-2-methylphenol	ND	---	218	"	"	---	---	---	---	---	---	
2-Methylphenol	ND	---	9.09	"	"	---	---	---	---	---	---	
3+4-Methylphenol(s)	ND	---	9.09	"	"	---	---	---	---	---	---	
2-Nitrophenol	ND	---	36.4	"	"	---	---	---	---	---	---	

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3015 SW First Avenue  
Portland, OR 97201Project: Pier 99  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090508 - EPA 3546						Soil						
Blank (3090508-BLK1)			Prepared: 09/23/13 07:40    Analyzed: 09/23/13 12:42									
4-Nitrophenol	ND	---	36.4	ug/kg wet	"	---	---	---	---	---	---	
Pentachlorophenol (PCP)	ND	---	36.4	"	"	---	---	---	---	---	---	
Phenol	ND	---	12.7	"	"	---	---	---	---	---	---	
2,3,4,6-Tetrachlorophenol	ND	---	18.2	"	"	---	---	---	---	---	---	
2,4,5-Trichlorophenol	ND	---	18.2	"	"	---	---	---	---	---	---	
2,4,6-Trichlorophenol	ND	---	18.2	"	"	---	---	---	---	---	---	
Bis(2-ethylhexyl)phthalate	ND	---	36.4	"	"	---	---	---	---	---	---	B-02
Butyl benzyl phthalate	ND	---	36.4	"	"	---	---	---	---	---	---	
Diethylphthalate	ND	---	36.4	"	"	---	---	---	---	---	---	
Dimethylphthalate	ND	---	36.4	"	"	---	---	---	---	---	---	
Di-n-butylphthalate	ND	---	36.4	"	"	---	---	---	---	---	---	B-02
Di-n-octyl phthalate	ND	---	72.7	"	"	---	---	---	---	---	---	
Surr: Nitrobenzene-d5 (Surr)		Recovery: 82 %		Limits: 35-120 %		Dilution: 1x						
2-Fluorobiphenyl (Surr)		78 %		45-120 %		"						
Phenol-d6 (Surr)		95 %		40-120 %		"						
p-Terphenyl-d14 (Surr)		103 %		30-125 %		"						
2-Fluorophenol (Surr)		91 %		35-120 %		"						
2,4,6-Tribromophenol (Surr)		78 %		35-125 %		"						
LCS (3090508-BS1)						Prepared: 09/23/13 07:40    Analyzed: 09/23/13 13:19						
EPA 8270D P/P/P												
Acenaphthene	666	---	4.00	ug/kg wet	1	800	---	83	45-120%	---	---	
Acenaphthylene	697	---	4.00	"	"	"	---	87	"	---	---	
Anthracene	842	---	4.00	"	"	"	---	105	55-120%	---	---	
Benz(a)anthracene	894	---	4.00	"	"	"	---	112	50-120%	---	---	
Benzo(a)pyrene	891	---	6.00	"	"	"	---	111	"	---	---	
Benzo(b)fluoranthene	869	---	6.00	"	"	"	---	109	45-120%	---	---	
Benzo(k)fluoranthene	851	---	6.00	"	"	"	---	106	45-125%	---	---	
Benzo(b+k)fluoranthene(s)	1710	---	12.0	"	"	1600	---	107	"	---	---	
Benzo(g,h,i)perylene	834	---	4.00	"	"	800	---	104	40-125%	---	---	
Chrysene	856	---	4.00	"	"	"	---	107	55-120%	---	---	
Dibenz(a,h)anthracene	900	---	4.00	"	"	"	---	113	40-125%	---	---	

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Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3090508 - EPA 3546</b>						<b>Soil</b>						
<b>LCS (3090508-BS1)</b>						Prepared: 09/23/13 07:40 Analyzed: 09/23/13 13:19						
Fluoranthene	858	---	4.00	ug/kg wet	"	"	---	107	55-120%	---	---	
Fluorene	739	---	4.00	"	"	"	---	92	50-120%	---	---	
Indeno(1,2,3-cd)pyrene	872	---	4.00	"	"	"	---	109	40-120%	---	---	
1-Methylnaphthalene	626	---	8.00	"	"	"	---	78	45-120%	---	---	
2-Methylnaphthalene	646	---	8.00	"	"	"	---	81	"	---	---	
Naphthalene	586	---	8.00	"	"	"	---	73	40-120%	---	---	
Phenanthrene	782	---	4.00	"	"	"	---	98	50-120%	---	---	
Pyrene	826	---	4.00	"	"	"	---	103	45-120%	---	---	
Carbazole	899	---	6.00	"	"	"	---	112	"	---	---	
Dibenzofuran	693	---	4.00	"	"	"	---	87	50-120%	---	---	
4-Chloro-3-methylphenol	689	---	40.0	"	"	"	---	86	45-120%	---	---	
2-Chlorophenol	621	---	20.0	"	"	"	---	78	"	---	---	
2,4-Dichlorophenol	612	---	20.0	"	"	"	---	77	"	---	---	
2,4-Dimethylphenol	692	---	20.0	"	"	"	---	86	30-120%	---	---	
2,4-Dinitrophenol	758	---	80.0	"	"	"	---	95	15-130%	---	---	
4,6-Dinitro-2-methylphenol	745	---	240	"	"	"	---	93	30-135%	---	---	
2-Methylphenol	577	---	10.0	"	"	"	---	72	40-120%	---	---	
3+4-Methylphenol(s)	634	---	10.0	"	"	"	---	79	"	---	---	
2-Nitrophenol	631	---	40.0	"	"	"	---	79	"	---	---	
4-Nitrophenol	777	---	40.0	"	"	"	---	97	15-140%	---	---	
Pentachlorophenol (PCP)	740	---	40.0	"	"	"	---	93	25-120%	---	---	
Phenol	682	---	8.00	"	"	"	---	85	40-120%	---	---	Q-41
2,3,4,6-Tetrachlorophenol	717	---	20.0	"	"	"	---	90	"	---	---	
2,4,5-Trichlorophenol	681	---	20.0	"	"	"	---	85	50-120%	---	---	
2,4,6-Trichlorophenol	649	---	20.0	"	"	"	---	81	45-120%	---	---	
Bis(2-ethylhexyl)phthalate	885	---	40.0	"	"	"	---	111	45-125%	---	---	B-02
Butyl benzyl phthalate	939	---	40.0	"	"	"	---	117	50-125%	---	---	
Diethylphthalate	859	---	40.0	"	"	"	---	107	50-120%	---	---	
Dimethylphthalate	773	---	40.0	"	"	"	---	97	"	---	---	
Di-n-butylphthalate	879	---	40.0	"	"	"	---	110	55-120%	---	---	B-02
Di-n-octyl phthalate	961	---	80.0	"	"	"	---	120	40-130%	---	---	

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Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090508 - EPA 3546						Soil						
LCS (3090508-BS1)						Prepared: 09/23/13 07:40    Analyzed: 09/23/13 13:19						
Surr: Nitrobenzene-d5 (Surr)		Recovery: 69 %		Limits: 35-120 %		Dilution: 1x						
2-Fluorobiphenyl (Surr)		73 %		45-120 %		"						
Phenol-d6 (Surr)		80 %		40-120 %		"						
p-Terphenyl-d14 (Surr)		99 %		30-125 %		"						
2-Fluorophenol (Surr)		77 %		35-120 %		"						
2,4,6-Tribromophenol (Surr)		85 %		35-125 %		"						
Duplicate (3090508-DUP1)						Prepared: 09/23/13 07:40    Analyzed: 09/23/13 13:36						
QC Source Sample: REX-1 (0-0.5) (A310420-02RE1)												
EPA 8270D P/P/P												
Acenaphthene	ND	---	110	ug/kg dry	10	---	ND	---	---	---	30%	Q-05
Acenaphthylene	ND	---	110	"	"	---	ND	---	---	---	30%	
Anthracene	ND	---	110	"	"	---	ND	---	---	---	30%	
Benz(a)anthracene	ND	---	110	"	"	---	81.2	---	---	***	30%	
Benzo(a)pyrene	ND	---	164	"	"	---	155	---	---	***	30%	
Benzo(b)fluoranthene	165	---	164	"	"	---	170	---	---	3	30%	M-02, Q-05
Benzo(k)fluoranthene	ND	---	164	"	"	---	90.3	---	---	***	30%	
Benzo(b+k)fluoranthene(s)	ND	---	329	"	"	---	278	---	---	***	30%	
Chrysene	229	---	110	"	"	---	136	---	---	50	30%	
Fluoranthene	ND	---	110	"	"	---	107	---	---	***	30%	
Fluorene	ND	---	110	"	"	---	ND	---	---	---	30%	
1-Methylnaphthalene	ND	---	219	"	"	---	ND	---	---	---	30%	
2-Methylnaphthalene	ND	---	219	"	"	---	ND	---	---	---	30%	
Naphthalene	ND	---	219	"	"	---	ND	---	---	---	30%	
Phenanthrene	ND	---	110	"	"	---	ND	---	---	---	30%	
Pyrene	132	---	110	"	"	---	124	---	---	6	30%	
Carbazole	ND	---	164	"	"	---	ND	---	---	---	30%	
Dibenzofuran	ND	---	110	"	"	---	ND	---	---	---	30%	
4-Chloro-3-methylphenol	ND	---	1100	"	"	---	ND	---	---	---	30%	
2-Chlorophenol	ND	---	548	"	"	---	ND	---	---	---	30%	
2,4-Dichlorophenol	ND	---	548	"	"	---	ND	---	---	---	30%	
2,4-Dimethylphenol	ND	---	548	"	"	---	ND	---	---	---	30%	

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090508 - EPA 3546							Soil					
Duplicate (3090508-DUP1)				Prepared: 09/23/13 07:40    Analyzed: 09/23/13 13:36								
QC Source Sample: REX-1 (0-0.5) (A3I0420-02RE1)												
2,4-Dinitrophenol	ND	---	2190	ug/kg dry	"	---	ND	---	---	---	30%	
4,6-Dinitro-2-methylphenol	ND	---	6580	"	"	---	ND	---	---	---	30%	
2-Methylphenol	ND	---	274	"	"	---	ND	---	---	---	30%	
3+4-Methylphenol(s)	ND	---	274	"	"	---	ND	---	---	---	30%	
2-Nitrophenol	ND	---	1100	"	"	---	ND	---	---	---	30%	
4-Nitrophenol	ND	---	1100	"	"	---	ND	---	---	---	30%	
Pentachlorophenol (PCP)	ND	---	1100	"	"	---	ND	---	---	---	30%	
Phenol	ND	---	384	"	"	---	ND	---	---	---	30%	
2,3,4,6-Tetrachlorophenol	ND	---	548	"	"	---	ND	---	---	---	30%	
2,4,5-Trichlorophenol	ND	---	548	"	"	---	ND	---	---	---	30%	
2,4,6-Trichlorophenol	ND	---	548	"	"	---	ND	---	---	---	30%	
Bis(2-ethylhexyl)phthalate	ND	---	1100	"	"	---	658	---	---	---	30%	***
Butyl benzyl phthalate	ND	---	1100	"	"	---	ND	---	---	---	30%	
Diethylphthalate	ND	---	1100	"	"	---	ND	---	---	---	30%	
Dimethylphthalate	ND	---	1100	"	"	---	1060	---	---	---	30%	***
Di-n-butylphthalate	ND	---	1100	"	"	---	ND	---	---	---	30%	
Di-n-octyl phthalate	ND	---	2190	"	"	---	ND	---	---	---	30%	

<i>Surr: Nitrobenzene-d5 (Surr)</i>	<i>Recovery: 92 %</i>	<i>Limits: 35-120 %</i>	<i>Dilution: 10x</i>
<i>2-Fluorobiphenyl (Surr)</i>	<i>84 %</i>	<i>45-120 %</i>	<i>"</i>
<i>Phenol-d6 (Surr)</i>	<i>99 %</i>	<i>40-120 %</i>	<i>"</i>
<i>p-Terphenyl-d14 (Surr)</i>	<i>100 %</i>	<i>30-125 %</i>	<i>"</i>
<i>2-Fluorophenol (Surr)</i>	<i>81 %</i>	<i>35-120 %</i>	<i>"</i>
<i>2,4,6-Tribromophenol (Surr)</i>	<i>104 %</i>	<i>35-125 %</i>	<i>"</i>

### Duplicate (3090508-DUP5)

Prepared: 09/23/13 07:40 Analyzed: 09/24/13 12:47

QC Source Sample: REX-1 (0-0.5) (A3I0420-02)

### EPA 8270D P/P/P

Benzo(g,h,i)perylene	ND	---	439	ug/kg dry	40	---	ND	---	---	---	30%
Dibenz(a,h)anthracene	ND	---	439	"	"	---	ND	---	---	---	30%
Indeno(1,2,3-cd)pyrene	ND	---	439	"	"	---	ND	---	---	---	30%

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090508 - EPA 3546						Soil						
Matrix Spike (3090508-MS1)						Prepared: 09/23/13 07:40    Analyzed: 09/23/13 18:33						
QC Source Sample: REX-2 (0-0.5) (A3I0420-03RE1)												
EPA 8270D P/P/P												
Acenaphthene	768	---	17.0	ug/kg dry	4	851	ND	90	45-120%	---	---	
Acenaphthylene	807	---	17.0	"	"	"	ND	95	"	---	---	
Anthracene	939	---	17.0	"	"	"	ND	110	55-120%	---	---	
Benz(a)anthracene	947	---	17.0	"	"	"	26.8	108	50-120%	---	---	
Benzo(a)pyrene	1070	---	25.5	"	"	"	46.2	120	"	---	---	
Benzo(b)fluoranthene	1230	---	25.5	"	"	"	56.6	138	45-120%	---	---	Q-01
Benzo(k)fluoranthene	1170	---	25.5	"	"	"	24.1	134	45-125%	---	---	Q-01
Benzo(b+k)fluoranthene(s)	2420	---	51.1	"	"	1700	86.5	137	"	---	---	Q-01
Chrysene	948	---	17.0	"	"	851	36.4	107	55-120%	---	---	
Fluoranthene	973	---	17.0	"	"	"	41.3	109	"	---	---	
Fluorene	861	---	17.0	"	"	"	ND	101	50-120%	---	---	
1-Methylnaphthalene	718	---	34.0	"	"	"	ND	84	45-120%	---	---	
2-Methylnaphthalene	713	---	34.0	"	"	"	ND	84	"	---	---	
Naphthalene	611	---	34.0	"	"	"	ND	72	40-120%	---	---	
Phenanthrene	877	---	17.0	"	"	"	19.4	101	50-120%	---	---	
Pyrene	956	---	17.0	"	"	"	44.8	107	45-120%	---	---	
Carbazole	1470	---	25.5	"	"	"	ND	173	"	---	---	Q-01, Q-41
Dibenzofuran	806	---	17.0	"	"	"	ND	95	50-120%	---	---	
4-Chloro-3-methylphenol	963	---	170	"	"	"	ND	113	45-120%	---	---	
2-Chlorophenol	707	---	85.1	"	"	"	ND	83	"	---	---	
2,4-Dichlorophenol	816	---	85.1	"	"	"	ND	96	"	---	---	
2,4-Dimethylphenol	671	---	85.1	"	"	"	ND	79	30-120%	---	---	
2,4-Dinitrophenol	784	---	340	"	"	"	ND	92	15-130%	---	---	Q-41
4,6-Dinitro-2-methylphenol	ND	---	1020	"	"	"	ND	100	30-135%	---	---	
2-Methylphenol	827	---	42.6	"	"	"	ND	97	40-120%	---	---	
3+4-Methylphenol(s)	894	---	42.6	"	"	"	ND	105	"	---	---	
2-Nitrophenol	653	---	170	"	"	"	ND	77	"	---	---	
4-Nitrophenol	1020	---	170	"	"	"	ND	120	15-140%	---	---	
Pentachlorophenol (PCP)	877	---	170	"	"	"	88.9	93	25-120%	---	---	

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3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090508 - EPA 3546						Soil						
Matrix Spike (3090508-MS1)				Prepared: 09/23/13 07:40    Analyzed: 09/23/13 18:33								
QC Source Sample: REX-2 (0-0.5) (A3I0420-03RE1)												
Phenol	800	---	59.6	ug/kg dry	"	"	ND	94	40-120%	---	---	
2,3,4,6-Tetrachlorophenol	1020	---	85.1	"	"	"	ND	119	"	---	---	
2,4,5-Trichlorophenol	886	---	85.1	"	"	"	ND	104	50-120%	---	---	
2,4,6-Trichlorophenol	920	---	85.1	"	"	"	ND	108	45-120%	---	---	
Bis(2-ethylhexyl)phthalate	1220	---	170	"	"	"	207	119	45-125%	---	---	
Butyl benzyl phthalate	1210	---	170	"	"	"	ND	142	50-125%	---	---	Q-01
Diethylphthalate	944	---	170	"	"	"	ND	111	50-120%	---	---	
Dimethylphthalate	1150	---	170	"	"	"	410	87	"	---	---	
Di-n-butylphthalate	1280	---	170	"	"	"	253	121	55-120%	---	---	B-02, Q-01
Di-n-octyl phthalate	1670	---	340	"	"	"	ND	197	40-130%	---	---	Q-01
Surr: Nitrobenzene-d5 (Surr)		Recovery: 79 %		Limits: 35-120 %		Dilution: 4x						
2-Fluorobiphenyl (Surr)		78 %		45-120 %		"						
Phenol-d6 (Surr)		97 %		40-120 %		"						
p-Terphenyl-d14 (Surr)		105 %		30-125 %		"						
2-Fluorophenol (Surr)		76 %		35-120 %		"						
2,4,6-Tribromophenol (Surr)		105 %		35-125 %		"						

#### Matrix Spike (3090508-MS2)

Prepared: 09/23/13 07:40 Analyzed: 09/24/13 12:10

#### QC Source Sample: REX-2 (0-0.5) (A3I0420-03)

##### EPA 8270D P/P/P

Benzo(g,h,i)perylene	923	---	170	ug/kg dry	40	851	107	96	40-125%	---	---	
Dibenz(a,h)anthracene	868	---	170	"	"	"	ND	102	"	---	---	
Indeno(1,2,3-cd)pyrene	880	---	170	"	"	"	ND	103	40-120%	---	---	

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3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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## Batch 3090527 - EPA 3051A

## Soil

## Blank (3090527-BLK1)

Prepared: 09/23/13 13:46 Analyzed: 09/24/13 17:07

## EPA 6020A

Antimony	ND	0.500	1.00	mg/kg wet	10	---	---	---	---	---	---	
Arsenic	ND	---	1.00	"	"	---	---	---	---	---	---	
Barium	ND	---	1.00	"	"	---	---	---	---	---	---	
Cadmium	ND	0.100	0.200	"	"	---	---	---	---	---	---	
Chromium	ND	0.500	1.00	"	"	---	---	---	---	---	---	
Copper	ND	0.500	1.00	"	"	---	---	---	---	---	---	
Lead	ND	0.100	0.200	"	"	---	---	---	---	---	---	
Mercury	ND	---	0.0800	"	"	---	---	---	---	---	---	
Nickel	ND	0.500	1.00	"	"	---	---	---	---	---	---	
Selenium	ND	---	1.00	"	"	---	---	---	---	---	---	
Silver	ND	---	0.200	"	"	---	---	---	---	---	---	
Zinc	ND	2.00	4.00	"	"	---	---	---	---	---	---	

## LCS (3090527-BS1)

Prepared: 09/23/13 13:46 Analyzed: 09/24/13 17:10

## EPA 6020A

Antimony	26.1	0.500	1.00	mg/kg wet	10	25.0	---	104	80-120%	---	---	
Arsenic	51.9	---	1.00	"	"	50.0	---	104	"	---	---	
Barium	50.7	---	1.00	"	"	"	---	101	"	---	---	
Cadmium	52.4	0.100	0.200	"	"	"	---	105	"	---	---	
Chromium	49.5	0.500	1.00	"	"	"	---	99	"	---	---	
Copper	49.5	0.500	1.00	"	"	"	---	99	"	---	---	
Lead	49.6	0.100	0.200	"	"	"	---	99	"	---	---	
Mercury	0.982	---	0.0800	"	"	1.00	---	98	"	---	---	
Nickel	48.1	0.500	1.00	"	"	50.0	---	96	"	---	---	
Selenium	26.7	---	1.00	"	"	25.0	---	107	"	---	---	
Silver	24.7	---	0.200	"	"	"	---	99	"	---	---	
Zinc	53.4	2.00	4.00	"	"	50.0	---	107	"	---	---	

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Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

## TCLP Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090622 - EPA 1311/3015						Soil						
Blank (3090622-BLK1)						Prepared: 09/26/13 10:40		Analyzed: 09/26/13 13:18				
1311/6020A												
Arsenic	ND	---	0.100	mg/L	5	---	---	---	---	---	---	Q-44, TCLP
Barium	ND	---	0.500	"	"	---	---	---	---	---	---	Q-44, TCLP
Cadmium	ND	---	0.0500	"	"	---	---	---	---	---	---	Q-44, TCLP
Chromium	ND	---	0.100	"	"	---	---	---	---	---	---	Q-44, TCLP
Lead	ND	---	0.0500	"	"	---	---	---	---	---	---	Q-44, TCLP
Mercury	ND	---	0.00400	"	"	---	---	---	---	---	---	Q-44, TCLP
Selenium	ND	---	0.100	"	"	---	---	---	---	---	---	Q-44, TCLP
Silver	ND	---	0.0500	"	"	---	---	---	---	---	---	Q-44, TCLP
LCS (3090622-BS1)						Prepared: 09/26/13 10:40		Analyzed: 09/26/13 13:26				
1311/6020A												
Arsenic	2.55	---	0.100	mg/L	5	2.50	---	102	80-120%	---	---	Q-44, TCLP
Barium	2.53	---	0.500	"	"	"	---	101	"	---	---	Q-44, TCLP
Cadmium	2.50	---	0.0500	"	"	"	---	100	"	---	---	Q-44, TCLP
Chromium	2.46	---	0.100	"	"	"	---	98	"	---	---	Q-44, TCLP
Lead	2.54	---	0.0500	"	"	"	---	102	"	---	---	Q-44, TCLP
Mercury	0.0508	---	0.00400	"	"	0.0500	---	102	"	---	---	Q-44, TCLP
Selenium	2.57	---	0.100	"	"	2.50	---	103	"	---	---	Q-44, TCLP
Silver	1.24	---	0.0500	"	"	1.25	---	100	"	---	---	Q-44, TCLP
Matrix Spike (3090622-MS1)						Prepared: 09/26/13 10:40		Analyzed: 09/26/13 13:53				
QC Source Sample: ASH STOCKPILE (A310420-05)												
1311/6020A												
Arsenic	2.55	---	0.100	mg/L	5	2.50	ND	102	50-150%	---	---	Q-44
Barium	3.91	---	0.500	"	"	"	1.40	100	"	---	---	Q-44
Cadmium	2.62	---	0.0500	"	"	"	0.0725	102	"	---	---	Q-44
Chromium	2.45	---	0.100	"	"	"	ND	98	"	---	---	Q-44
Lead	35.8	---	0.0500	"	"	"	32.5	131	"	---	---	Q-44
Mercury	0.0526	---	0.00400	"	"	0.0500	ND	105	"	---	---	Q-44
Selenium	2.54	---	0.100	"	"	2.50	ND	102	"	---	---	Q-44
Silver	1.26	---	0.0500	"	"	1.25	ND	101	"	---	---	Q-44

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Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

### TCLP Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090622 - EPA 1311/3015							Soil					

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3015 SW First Avenue  
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Project: **Pier 99**  
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Project Manager: John Foxwell

Reported:  
10/22/13 10:49

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090540 - Total Solids (Dry Weight)							Soil					
Duplicate (3090540-DUP1)					Prepared: 09/23/13 16:53		Analyzed: 09/24/13 09:53					
QC Source Sample: ASH STOCKPILE (A3I0420-05)												
NWTPH-Dx												
% Solids	87.2	---	1.00	% by Weight	1	---	88.3	---	---	1	20%	

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

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3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
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Reported:  
10/22/13 10:49

## SAMPLE PREPARATION INFORMATION

### Volatile Organic Compounds by EPA 8260B

#### Prep: EPA 5030B

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3090476							
A3I0420-01RE1	Water	EPA 8260B	09/19/13 09:30	09/20/13 13:00	5mL/5mL	5mL/5mL	1.00

### Polychlorinated Biphenyls by EPA 8082A

#### Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3090518							
A3I0420-03	Soil	EPA 8082A	09/19/13 10:20	09/23/13 10:00	10.91g/5mL	10g/5mL	0.92
Batch: 3090586							
A3I0420-02RE1	Soil	EPA 8082A	09/19/13 10:10	09/25/13 10:29	10.53g/5mL	10g/5mL	0.95
Batch: 3100052							
A3I0420-05RE1	Soil	EPA 8082A	09/19/13 11:05	10/02/13 11:57	10.67g/5mL	10g/5mL	0.94

### Organochlorine Pesticides by EPA 8081B

#### Prep: EPA 3546/3640A (GPC)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3090537							
A3I0420-02RE1	Soil	EPA 8081B	09/19/13 10:10	09/23/13 07:45	10.38g/20mL	10g/5mL	3.85
A3I0420-03RE1	Soil	EPA 8081B	09/19/13 10:20	09/23/13 07:45	10.43g/10mL	10g/5mL	1.92

### Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

#### Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3090508							
A3I0420-02RE1	Soil	EPA 8270D P/P/P	09/19/13 10:10	09/23/13 07:40	10.17g/5mL	10g/2mL	2.46
A3I0420-03	Soil	EPA 8270D P/P/P	09/19/13 10:20	09/23/13 07:40	10.3g/2mL	10g/2mL	0.97
A3I0420-03RE1	Soil	EPA 8270D P/P/P	09/19/13 10:20	09/23/13 07:40	10.3g/2mL	10g/2mL	0.97

### Total Metals by EPA 6020 (ICPMS)

#### Prep: EPA 3051A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3090527							
A3I0420-02	Soil	EPA 6020A	09/19/13 10:10	09/23/13 13:46	0.511g/50mL	0.5g/50mL	0.98

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Reported:  
10/22/13 10:49

## SAMPLE PREPARATION INFORMATION

### Total Metals by EPA 6020 (ICPMS)

#### Prep: EPA 3051A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
A3I0420-03	Soil	EPA 6020A	09/19/13 10:20	09/23/13 13:46	0.512g/50mL	0.5g/50mL	0.98
A3I0420-04	Soil	EPA 6020A	09/19/13 10:40	09/23/13 13:46	0.487g/50mL	0.5g/50mL	1.03
A3I0420-05	Soil	EPA 6020A	09/19/13 11:05	09/23/13 13:46	0.495g/50mL	0.5g/50mL	1.01

### TCLP Extraction by EPA 1311

#### Prep: EPA 1311 (TCLP)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3090598							
A3I0420-05	Soil	EPA 1311	09/19/13 11:05	09/25/13 16:18	99.1g/1982mL	100g/2000mL	NA

### TCLP Metals by EPA 6020 (ICPMS)

#### Prep: EPA 1311/3015

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3090622							
A3I0420-05	Soil	1311/6020A	09/19/13 11:05	09/26/13 10:40	5mL/50mL	5mL/50mL	1.00

### Percent Dry Weight

#### Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3090540							
A3I0420-02	Soil	NWTPH-Dx	09/19/13 10:10	09/23/13 16:53	1N/A/1N/A	1N/A/1N/A	NA
A3I0420-03	Soil	NWTPH-Dx	09/19/13 10:20	09/23/13 16:53	1N/A/1N/A	1N/A/1N/A	NA
A3I0420-04	Soil	NWTPH-Dx	09/19/13 10:40	09/23/13 16:53	1N/A/1N/A	1N/A/1N/A	NA
A3I0420-05	Soil	NWTPH-Dx	09/19/13 11:05	09/23/13 16:53	1N/A/1N/A	1N/A/1N/A	NA

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

**Apex Companies, LLC**

3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**

Project Number: 1975-01  
Project Manager: John Foxwell

**Reported:**

10/22/13 10:49

## Notes and Definitions

### Qualifiers:

- B-02 Analyte detected in an associated blank at a level between one-half the MRL and the MRL. (See Notes and Conventions below.)
- C-05 Extract has undergone a GPC (Gel-Permeation Chromatography) cleanup per EPA 3640A. Reporting levels may be raised due to dilution necessary for cleanup. Sample Final Volume includes the GPC dilution factor, see the Prep page for details.
- C-07 Extract has undergone Sulfuric Acid Cleanup by EPA 3665A, Sulfur Cleanup by EPA 3660B, and Florisil Cleanup by EPA 3620B in order to minimize matrix interference.
- EST Result reported as an Estimated Value. Recovery for Lab Control Spike (LCS) is below the lower control limit. Data may be biased low.
- ESTa Result reported as an Estimated Value. Results estimated due to multiple aroclors and matrix interference present
- ESTc Result reported as an Estimated Value. Results estimated due to presence of multiple aroclors and matrix interference
- M-02 Due to matrix interference, this analyte cannot be accurately quantified. The reported result is estimated.
- Q-01 Spike recovery and/or RPD is outside acceptance limits.
- Q-04 Spike recovery and/or RPD is outside control limits due to a non-homogeneous sample matrix.
- Q-05 Analyses are not controlled on RPD values from sample or duplicate concentrations below 5 times the reporting level.
- Q-23 Recovery of Continuing Calibration Verification sample above upper control limit for this analyte. Data is likely biased high.
- Q-31 Estimated Results. Recovery of Continuing Calibration Verification sample below lower control limit for this analyte. Results are likely biased low.
- Q-41 Estimated Results. Recovery of Continuing Calibration Verification sample above upper control limit for this analyte. Results are likely biased high.
- Q-42 Matrix Spike and/or Duplicate analysis was performed on this sample. % Recovery or RPD for this analyte is outside laboratory control limits. (Refer to the QC Section of Analytical Report.)
- Q-44 Room temperature during the 18 hr. TCLP tumbling procedure exceeded EPA recommended temperature range by no more than +/-2 degrees C for a maximum of 2.5 hrs
- TCLP This batch QC sample was prepared with TCLP or SPLP fluid from preparation batch 3090598.

### Notes and Conventions:

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit

Apex Laboratories



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**Apex Companies, LLC**

3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**

Project Number: 1975-01

Project Manager: John Foxwell

**Reported:**

10/22/13 10:49

NR	Not Reported
dry	Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.
RPD	Relative Percent Difference
MDL	If MDL is not listed, data has been evaluated to the Method Reporting Limit only.
WMSC	Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.
Batch QC	Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.
Blank Policy	<p>Apex assesses blank data for potential high bias down to a level equal to ½ the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.</p> <p>For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.</p> <p>Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.</p>
---	QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.
***	Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Apex Laboratories



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Darrell Auvil For Darwin Thomas, Business Development Director

**Apex Companies, LLC**  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

**Reported:**  
10/22/13 10:49

503.924.4704  
503.943.6357  
ABIO420

<b>CHAIN OF CUSTODY RECORD</b>	
<b>Client Name:</b>	Apex Companies
<b>Address:</b>	3015 SW First Ave
<b>City/State/Zip:</b>	Portland, OR 97201

**APEX**  
3015 SW First Avenue  
Portland, Oregon 97201-4237  
(503) 924-4704 Phone  
(503) 943-6357 Fax

Analytical Lab: Apex Analytical

Report To: ifaxwell@iapexcoe.com

Page: 1 of 1

Project Number: 1975-01

**Sampler Name:** Ian Maguire

[illegible]



**Analytical Resources, Incorporated**  
Analytical Chemists and Consultants

September 26, 2013

Darwin Thomas  
Apex Laboratories  
12232 SW Garden Place  
Tigard, OR 97223

**Client Project: A3I0420**  
**ARI Job No.: XG09**

Dear Mr. Thomas:

Please find enclosed the original Chain of Custody record (COC), sample receipt documentation, and the final data for the samples from the project referenced above.

Sample receipt information and analytical details are addressed in the Case Narrative.

An electronic copy of this report and all supporting raw data will be kept on file at ARI. Should you have any questions or concerns, please feel free to call me at your convenience.

Respectfully,  
ANALYTICAL RESOURCES, INC.

Cheronne Oreiro  
Project Manager  
(206) 695-6214  
[cheronneo@arilabs.com](mailto:cheronneo@arilabs.com)  
[www.arilabs.com](http://www.arilabs.com)

cc: eFile: XG09

Enclosures

9-20-13 KH

# SUBCONTRACT ORDER

Apex Laboratories

A3I0420

## SENDING LABORATORY:

Apex Laboratories  
12232 S.W. Garden Place  
Tigard, OR 97223  
Phone: (503) 718-2323  
Fax: (503) 718-0333  
Project Manager: Darwin Thomas

## RECEIVING LABORATORY:

Analytical Resources, INC  
4611 S. 134th Place  
Tukwila, WA 98168  
Phone : (206) 695-6200  
Fax: (206) 695-6201

Sample Name: REX-1 (0-0.5) Soil Sampled: 09/19/13 10:10 (A3I0420-02)

Analysis	Due	Expires	Comments
Organotin Compounds (SUB)	09/26/13 17:00	03/18/14 10:10	RUSH 4-5 day TAT ---4 Butyltins/TBT, sub to ARI--
Containers Supplied: (C)4 oz Glass Jar			

Sample Name: REX-2 (0-0.5) Soil Sampled: 09/19/13 10:20 (A3I0420-03)

Analysis	Due	Expires	Comments
Organotin Compounds (SUB)	09/26/13 17:00	03/18/14 10:20	RUSH 4-5 day TAT ---4 Butyltins/TBT, sub to ARI--
Containers Supplied: (C)4 oz Glass Jar			

Due 9/26/13  
3-day TAT

*Krugler* 9/20/13 1400

Released By

Date

UPS (Shipper)

Received By

Date

UPS (Shipper)

Released By

Date

Received By

Date

9/24/13 1000



# Cooler Receipt Form

ARI Client: APEX

COC No(s): \_\_\_\_\_ (NA)

Assigned ARI Job No: XG09

Project Name: A3I0420

Delivered by: Fed EX UPS Courier Hand Delivered Other: \_\_\_\_\_

Tracking No: 1ZX4720R44 94936544 NA

## Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? \_\_\_\_\_

YES (NO)

Were custody papers included with the cooler? \_\_\_\_\_

(YES) NO

Were custody papers properly filled out (ink, signed, etc.) \_\_\_\_\_

(YES) NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time: 955

3.8

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 90877952

Cooler Accepted by: JM Date: 9/21/13 Time: 1000

**Complete custody forms and attach all shipping documents**

## Log-In Phase:

Was a temperature blank included in the cooler? \_\_\_\_\_

YES (NO)

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: \_\_\_\_\_

Was sufficient ice used (if appropriate)? \_\_\_\_\_

NA (YES) NO

Were all bottles sealed in individual plastic bags? \_\_\_\_\_

(YES) NO

Did all bottles arrive in good condition (unbroken)? \_\_\_\_\_

(YES) NO

Were all bottle labels complete and legible? \_\_\_\_\_

(YES) NO

Did the number of containers listed on COC match with the number of containers received? \_\_\_\_\_

(YES) NO

Did all bottle labels and tags agree with custody papers? \_\_\_\_\_

(YES) NO

Were all bottles used correct for the requested analyses? \_\_\_\_\_

(YES) NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) .

(NA) YES NO

Were all VOC vials free of air bubbles? \_\_\_\_\_

(NA) YES NO

Was sufficient amount of sample sent in each bottle? \_\_\_\_\_

(YES) NO

Date VOC Trip Blank was made at ARI. \_\_\_\_\_

(NA)

Was Sample Split by ARI (NA) YES Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_

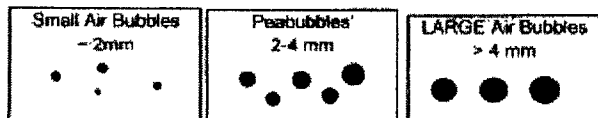
Samples Logged by: JM Date: 9/21/13 Time: 1012

**\*\* Notify Project Manager of discrepancies or concerns \*\***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

## Additional Notes, Discrepancies, & Resolutions:

By \_\_\_\_\_ Date: \_\_\_\_\_



Small → "sm" (< 2 mm)

Peabubbles → "pb" (2 to < 4 mm)

Large → "lg" (4 to < 6 mm)

Headspace → "hs" (> 6 mm)



## **Case Narrative**

**Client: Apex Laboratories**

**Project: A3I0420**

**ARI Job No.: XG09**

## **Sample Receipt**

Analytical Resources, Inc. (ARI) accepted two soil samples on September 21, 2013 under ARI job XG09. The cooler temperature measured by IR thermometer following ARI SOP was 3.8°C. For further details regarding sample receipt, please refer to the Cooler Receipt Form.

The samples were analyzed for parameters as requested on the COC.

## **Butyltins by Krone 1988 SIM**

There were no irregularities with this analysis.

# Sample ID Cross Reference Report



ARI Job No: XG09  
Client: Apex Laboratories  
Project Event: N/A  
Project Name: A3I0420

Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1. REX-1 (0-0.5)	XG09A	13-20321	Soil	09/19/13 10:10	09/21/13 10:00
2. REX-2 (0-0.5)	XG09B	13-20322	Soil	09/19/13 10:20	09/21/13 10:00

## ORGANICS ANALYSIS DATA SHEET

Tributyl Tins by Krone 1988 SIM GC/MS

Extraction Method: SW3546

Page 1 of 1

ANALYTICAL  
RESOURCES  
INCORPORATED

Sample ID: REX-1 (0-0.5)

SAMPLE

Lab Sample ID: XG09A

LIMS ID: 13-20321

Matrix: Soil

Data Release Authorized: *AB*

Reported: 09/26/13

QC Report No: XG09-Apex Laboratories

Project: A3I0420

Event: NA

Date Sampled: 09/19/13

Date Received: 09/21/13

Date Extracted: 09/24/13

Date Analyzed: 09/25/13 17:04

Instrument/Analyst: NT12/PK

Silica Gel Cleanup: No

Sample Amount: 5.07 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Alumina Cleanup: Yes

Moisture: 15.9%

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	Tributyltin Ion	1.0	3.8	280	
14488-53-0	Dibutyltin Ion	3.7	5.7	62	
78763-54-9	Butyltin Ion	2.3	4.0	340 E	
1461-25-2	Tetrabutyl Tin	4.9	4.9	< 4.9 U	

Reported in µg/kg (ppb)

## TBT Surrogate Recovery

Tripropyl Tin Chloride	45.1%
Triphenyl Tin Chloride	54.3%

**ORGANICS ANALYSIS DATA SHEET**

**Tributyl Tins by Krone 1988 SIM GC/MS**

**Extraction Method: SW3546**

Page 1 of 1

**Sample ID: REX-1 (0-0.5)**

**DILUTION**

Lab Sample ID: XG09A

LIMS ID: 13-20321

Matrix: Soil

Data Release Authorized: *[Signature]*

Reported: 09/26/13

QC Report No: XG09-Apex Laboratories

Project: A3I0420

Event: NA

Date Sampled: 09/19/13

Date Received: 09/21/13

Date Extracted: 09/24/13

Date Analyzed: 09/26/13 11:28

Instrument/Analyst: NT12/PK

Silica Gel Cleanup: No

Sample Amount: 5.07 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 3.00

Alumina Cleanup: Yes

Moisture: 15.9%

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	Tributyltin Ion	3.0	11	300	
14488-53-0	Dibutyltin Ion	11	17	68	
78763-54-9	Butyltin Ion	6.8	12	380	
1461-25-2	Tetrabutyl Tin	15	15	< 15	U

Reported in µg/kg (ppb)

**TBT Surrogate Recovery**

Tripropyl Tin Chloride	50.0%
Tripropyl Tin Chloride	57.6%

**ORGANICS ANALYSIS DATA SHEET**

**Tributyl Tins by Krone 1988 SIM GC/MS**

**Extraction Method: SW3546**

Page 1 of 1


**Sample ID: REX-2(0-0.5)**

**SAMPLE**

Lab Sample ID: XG09B

LIMS ID: 13-20322

Matrix: Soil

Data Release Authorized: 

Reported: 09/26/13

QC Report No: XG09-Apex Laboratories

Project: A3I0420

Event: NA

Date Sampled: 09/19/13

Date Received: 09/21/13

Date Extracted: 09/24/13

Date Analyzed: 09/25/13 17:18

Instrument/Analyst: NT12/PK

Silica Gel Cleanup: No

Sample Amount: 5.60 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Alumina Cleanup: Yes

Moisture: 20.4%

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	Tributyltin Ion	0.9	3.4	1,000 E	
14488-53-0	Dibutyltin Ion	3.4	5.2	510 E	
78763-54-9	Butyltin Ion	2.1	3.6	620 E	
1461-25-2	Tetrabutyl Tin	4.5	4.5	< 4.5 U	

Reported in µg/kg (ppb)

**TBT Surrogate Recovery**

Tripropyl Tin Chloride	41.5%
Tripropyl Tin Chloride	52.0%

**ORGANICS ANALYSIS DATA SHEET**

**Tributyl Tins by Krone 1988 SIM GC/MS**

**Extraction Method: SW3546**

Page 1 of 1

**Sample ID: REX-2(0-0.5)**

**DILUTION**

Lab Sample ID: XG09B

LIMS ID: 13-20322

Matrix: Soil

Data Release Authorized: 

Reported: 09/26/13

QC Report No: XG09-Apex Laboratories

Project: A3I0420

Event: NA

Date Sampled: 09/19/13

Date Received: 09/21/13

Date Extracted: 09/24/13

Date Analyzed: 09/26/13 11:42

Instrument/Analyst: NT12/PK

Silica Gel Cleanup: No

Sample Amount: 5.60 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 10.0

Alumina Cleanup: Yes

Moisture: 20.4%

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	Tributyltin Ion	9.1	34	1,100	
14488-53-0	Dibutyltin Ion	34	52	560	
78763-54-9	Butyltin Ion	21	36	660	
1461-25-2	Tetrabutyl Tin	45	45	< 45 U	

Reported in µg/kg (ppb)

**TBT Surrogate Recovery**

Tripropyl Tin Chloride	47.6%
Tripentyl Tin Chloride	51.1%

**TBT SURROGATE RECOVERY SUMMARY**

Matrix: Soil

QC Report No: XG09-Apex Laboratories  
Project: A3I0420  
Event: NA

<u>Client ID</u>	<u>TPRT</u>	<u>TPNT</u>	<u>TOT OUT</u>
MB-092413	52.7%	72.8%	0
LCS-092413	50.5%	72.1%	0
LCSD-092413	54.8%	74.0%	0
REX-1 (0-0.5)	45.1%	54.3%	0
REX-1 (0-0.5) DL	50.0%	57.6%	0
REX-2 (0-0.5)	41.5%	52.0%	0
REX-2 (0-0.5) DL	47.6%	51.1%	0

	<b>LCS/MB LIMITS</b>	<b>QC LIMITS</b>
(TPRT) = Tripropyl Tin Chloride	(28-106)	(32-104)
(TPNT) = Tripentyl Tin Chloride	(35-130)	(25-140)

Prep Method: SW3546  
Analytical Method: TBT (Hexyl) Krone 1988  
Log Number Range: 13-20321 to 13-20322

**ORGANICS ANALYSIS DATA SHEET**

**Tributyl Tins by Krone 1988 SIM GC/MS**

Page 1 of 1

**Sample ID: LCS-092413**

**LAB CONTROL SAMPLE**

Lab Sample ID: LCS-092413

LIMS ID: 13-20321

Matrix: Soil

Data Release Authorized: *[Signature]*

Reported: 09/26/13

QC Report No: XG09-Apex Laboratories

Project: A3I0420

Date Sampled: NA

Date Received: NA

Date Extracted LCS: 09/24/13

Sample Amount LCS: 5.00 g-dry-wt

LCSD: 5.00 g-dry-wt

Date Analyzed LCS: 09/25/13 16:36

Final Extract Volume LCS: 0.50 mL

LCSD: 09/25/13 16:50

LCSD: 0.50 mL

Instrument/Analyst LCS: NT12/PK

Dilution Factor LCS: 1.00

LCSD: NT12/PK

LCSD: 1.00

Silica Gel Cleanup: No

Alumina Cleanup: Yes

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Tributyltin Ion	30.8	44.6	69.1%	33.5	44.6	75.1%	8.4%
Dibutyltin Ion	26.4	38.4	68.8%	27.4	38.4	71.4%	3.7%
Butyltin Ion	21.7	31.2	69.6%	21.0	31.2	67.3%	3.3%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

**TBT Surrogate Recovery**

	LCS	LCSD
Tripropyl Tin Chloride	50.5%	54.8%
Triphenyl Tin Chloride	72.1%	74.0%

**ORGANICS ANALYSIS DATA SHEET****Tributyl Tins by Krone 1988 SIM GC/MS****Extraction Method: SW3546**

Page 1 of 1

**Sample ID: MB-092413****METHOD BLANK**

Lab Sample ID: MB-092413

LIMS ID: 13-20321

Matrix: Soil

Data Release Authorized: *[Signature]*

Reported: 09/26/13

QC Report No: XG09-Apex Laboratories

Project: A3I0420

Event: NA

Date Sampled: NA

Date Received: NA

Date Extracted: 09/24/13

Date Analyzed: 09/25/13 16:22

Instrument/Analyst: NT12/PK

Silica Gel Cleanup: No

Sample Amount: 5.00 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Alumina Cleanup: Yes

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	Tributyltin Ion	1.0	3.9	< 3.9 U	
14488-53-0	Dibutyltin Ion	3.8	5.8	< 5.8 U	
78763-54-9	Butyltin Ion	2.3	4.1	< 4.1 U	
1461-25-2	Tetrabutyl Tin	5.0	5.0	< 5.0 U	

Reported in µg/kg (ppb)

**TBT Surrogate Recovery**

Tripropyl Tin Chloride	52.7%
Triphenyl Tin Chloride	72.8%

# Apex Labs

12232 S.W. Garden Place  
Tigard, OR 97223  
503-718-2323 Phone  
503-718-0333 Fax

Tuesday, October 22, 2013

John Foxwell  
Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

RE: Pier 99 / 1975-01

Enclosed are the results of analyses for work order A310536, which was received by the laboratory on 9/25/2013 at 5:15:00PM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: [DAuvil@apex-labs.com](mailto:DAuvil@apex-labs.com), or by phone at 503-718-2323.

---

Apex Laboratories



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---

Darrell Auvil For Darwin Thomas, Business Development Director

Page 1 of 28

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 11:08

## ANALYTICAL REPORT FOR SAMPLES

### SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
REX-4 (34-40)	A3I0536-01	Soil	09/25/13 08:35	09/25/13 17:15
REX-5 (56-62)	A3I0536-02	Soil	09/25/13 09:10	09/25/13 17:15
REX-6 (9-15)	A3I0536-03	Soil	09/25/13 10:10	09/25/13 17:15
REX-7 (12-18)	A3I0536-04	Soil	09/25/13 10:30	09/25/13 17:15
REX-8 (18-24)	A3I0536-05	Soil	09/25/13 10:50	09/25/13 17:15
REX-9 (22-28)	A3I0536-06	Soil	09/25/13 11:20	09/25/13 17:15
REX-10 (18-24)	A3I0536-07	Soil	09/25/13 11:30	09/25/13 17:15
REX-11 (22-28)	A3I0536-08	Soil	09/25/13 12:15	09/25/13 17:15

Apex Laboratories



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Darrell Auvil For Darwin Thomas, Business Development Director

Page 2 of 28

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 11:08

## ANALYTICAL SAMPLE RESULTS

### Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-5 (56-62) (A3I0536-02)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090652</b>			<b>C-07</b>
Aroclor 1016	ND	---	10.3	ug/kg dry	1	09/27/13 15:16	EPA 8082A	
Aroclor 1221	ND	---	10.3	"	"	"	"	
Aroclor 1232	ND	---	10.3	"	"	"	"	
Aroclor 1242	ND	---	10.3	"	"	"	"	
Aroclor 1248	ND	---	10.3	"	"	"	"	
Aroclor 1254	ND	---	10.3	"	"	"	"	
Aroclor 1260	ND	---	10.3	"	"	"	"	
Aroclor 1262	ND	---	10.3	"	"	"	"	
Aroclor 1268	ND	---	10.3	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl (Surr)</i>		<i>Recovery: 105 %</i>		<i>Limits: 60-125 %</i>		"	"	<i>Q-23</i>
<b>REX-9 (22-28) (A3I0536-06)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090652</b>			<b>C-07</b>
Aroclor 1016	ND	---	10.2	ug/kg dry	1	09/27/13 15:34	EPA 8082A	
Aroclor 1221	ND	---	10.2	"	"	"	"	
Aroclor 1232	ND	---	10.2	"	"	"	"	
Aroclor 1242	ND	---	10.2	"	"	"	"	
Aroclor 1248	ND	---	10.2	"	"	"	"	
Aroclor 1254	ND	---	10.2	"	"	"	"	
Aroclor 1260	ND	---	10.2	"	"	"	"	
Aroclor 1262	ND	---	10.2	"	"	"	"	
Aroclor 1268	ND	---	10.2	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl (Surr)</i>		<i>Recovery: 113 %</i>		<i>Limits: 60-125 %</i>		"	"	<i>Q-23</i>

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Darrell Auil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 11:08

## ANALYTICAL SAMPLE RESULTS

### Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-5 (56-62) (A3I0536-02RE1)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090680</b>		<b>C-05</b>	
Aldrin	ND	---	1.62	ug/kg dry	1	09/30/13 14:07	EPA 8081B	
alpha-BHC	ND	---	1.62	"	"	"	"	
beta-BHC	ND	---	1.62	"	"	"	"	
delta-BHC	ND	---	1.62	"	"	"	"	
gamma-BHC (Lindane)	ND	---	1.62	"	"	"	"	
cis-Chlordane	ND	---	1.62	"	"	"	"	
trans-Chlordane	ND	---	1.62	"	"	"	"	
4,4'-DDD	ND	---	1.62	"	"	"	"	
4,4'-DDE	ND	---	1.62	"	"	"	"	
4,4'-DDT	ND	---	1.62	"	"	"	"	
Dieldrin	ND	---	1.62	"	"	"	"	
Endosulfan I	ND	---	1.62	"	"	"	"	
Endosulfan II	ND	---	1.62	"	"	"	"	
Endosulfan sulfate	ND	---	1.62	"	"	"	"	
Endrin	ND	---	1.62	"	"	"	"	
Endrin Aldehyde	ND	---	1.62	"	"	"	"	
Endrin ketone	ND	---	1.62	"	"	"	"	
Heptachlor	ND	---	1.62	"	"	"	"	
Heptachlor epoxide	ND	---	1.62	"	"	"	"	
Methoxychlor	ND	---	4.85	"	"	"	"	
Chlordane (Technical)	ND	---	48.5	"	"	"	"	
Toxaphene (Total)	ND	---	48.5	"	"	"	"	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 67 %</i>	<i>Limits: 50-125 %</i>	"	"	"	
<i>Decachlorobiphenyl (Surr)</i>			<i>91 %</i>	<i>Limits: 55-130 %</i>	"	"	"	

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## ANALYTICAL SAMPLE RESULTS

### Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-9 (22-28) (A3I0536-06RE1)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090680</b>		<b>C-05</b>	
Aldrin	ND	---	1.77	ug/kg dry	1	09/30/13 14:25	EPA 8081B	
alpha-BHC	ND	---	1.77	"	"	"	"	
beta-BHC	ND	---	1.77	"	"	"	"	
delta-BHC	ND	---	1.77	"	"	"	"	
gamma-BHC (Lindane)	ND	---	1.77	"	"	"	"	
cis-Chlordane	ND	---	1.77	"	"	"	"	
trans-Chlordane	ND	---	1.77	"	"	"	"	
4,4'-DDD	ND	---	1.77	"	"	"	"	
4,4'-DDE	ND	---	1.77	"	"	"	"	
4,4'-DDT	ND	---	1.77	"	"	"	"	
Dieldrin	ND	---	1.77	"	"	"	"	
Endosulfan I	ND	---	1.77	"	"	"	"	
Endosulfan II	ND	---	1.77	"	"	"	"	
Endosulfan sulfate	ND	---	1.77	"	"	"	"	
Endrin	ND	---	1.77	"	"	"	"	
Endrin Aldehyde	ND	---	1.77	"	"	"	"	
Endrin ketone	ND	---	1.77	"	"	"	"	
Heptachlor	ND	---	1.77	"	"	"	"	
Heptachlor epoxide	ND	---	1.77	"	"	"	"	
Methoxychlor	ND	---	5.31	"	"	"	"	
Chlordane (Technical)	ND	---	53.1	"	"	"	"	
Toxaphene (Total)	ND	---	53.1	"	"	"	"	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 78 %</i>	<i>Limits: 50-125 %</i>	"	"	"	
<i>Decachlorobiphenyl (Surr)</i>			<i>92 %</i>	<i>Limits: 55-130 %</i>	"	"	"	

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## ANALYTICAL SAMPLE RESULTS

### Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-5 (56-62) (A3I0536-02RE1)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090650</b>			
Acenaphthene	ND	---	3.37	ug/kg dry	1	09/27/13 14:31	EPA 8270D P/P/P	
Acenaphthylene	ND	---	3.37	"	"	"	"	
Anthracene	ND	---	3.37	"	"	"	"	
Benz(a)anthracene	ND	---	3.37	"	"	"	"	
Benzo(a)pyrene	ND	---	5.06	"	"	"	"	
Benzo(b)fluoranthene	ND	---	5.06	"	"	"	"	
Benzo(k)fluoranthene	ND	---	5.06	"	"	"	"	
Benzo(g,h,i)perylene	ND	---	3.37	"	"	"	"	
Chrysene	ND	---	3.37	"	"	"	"	
Dibenz(a,h)anthracene	ND	---	3.37	"	"	"	"	
Fluoranthene	ND	---	3.37	"	"	"	"	
Fluorene	ND	---	3.37	"	"	"	"	
Indeno(1,2,3-cd)pyrene	ND	---	3.37	"	"	"	"	
<b>1-Methylnaphthalene</b>	<b>6.80</b>	---	6.74	"	"	"	"	
<b>2-Methylnaphthalene</b>	<b>10.0</b>	---	6.74	"	"	"	"	
Naphthalene	ND	---	6.74	"	"	"	"	
Phenanthrene	ND	---	3.37	"	"	"	"	
Pyrene	ND	---	3.37	"	"	"	"	
Carbazole	ND	---	5.06	"	"	"	"	
Dibenzofuran	ND	---	3.37	"	"	"	"	
4-Chloro-3-methylphenol	ND	---	33.7	"	"	"	"	
2-Chlorophenol	ND	---	16.9	"	"	"	"	
2,4-Dichlorophenol	ND	---	16.9	"	"	"	"	
2,4-Dimethylphenol	ND	---	16.9	"	"	"	"	
2,4-Dinitrophenol	ND	---	67.4	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	---	202	"	"	"	"	
2-Methylphenol	ND	---	8.43	"	"	"	"	
3+4-Methylphenol(s)	ND	---	8.43	"	"	"	"	
2-Nitrophenol	ND	---	33.7	"	"	"	"	
4-Nitrophenol	ND	---	33.7	"	"	"	"	
Pentachlorophenol (PCP)	ND	---	33.7	"	"	"	"	
Phenol	ND	---	8.43	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	---	16.9	"	"	"	"	
2,4,5-Trichlorophenol	ND	---	16.9	"	"	"	"	
2,4,6-Trichlorophenol	ND	---	16.9	"	"	"	"	

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## ANALYTICAL SAMPLE RESULTS

### Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-5 (56-62) (A3I0536-02RE1)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090650</b>			
Bis(2-ethylhexyl)phthalate	ND	---	33.7	ug/kg dry	1	"	EPA 8270D P/P/P	
Butyl benzyl phthalate	ND	---	33.7	"	"	"	"	
Diethylphthalate	ND	---	33.7	"	"	"	"	
Dimethylphthalate	ND	---	33.7	"	"	"	"	
Di-n-butylphthalate	ND	---	33.7	"	"	"	"	
Di-n-octyl phthalate	ND	---	67.4	"	"	"	"	
<i>Surrogate: Nitrobenzene-d5 (Surr)</i>			<i>Recovery: 72 %</i>	<i>Limits: 35-120 %</i>	"	"	"	
<i>2-Fluorobiphenyl (Surr)</i>			<i>69 %</i>	<i>Limits: 45-120 %</i>	"	"	"	
<i>Phenol-d6 (Surr)</i>			<i>82 %</i>	<i>Limits: 40-120 %</i>	"	"	"	
<i>p-Terphenyl-d14 (Surr)</i>			<i>77 %</i>	<i>Limits: 30-125 %</i>	"	"	"	
<i>2-Fluorophenol (Surr)</i>			<i>78 %</i>	<i>Limits: 35-120 %</i>	"	"	"	
<i>2,4,6-Tribromophenol (Surr)</i>			<i>66 %</i>	<i>Limits: 35-125 %</i>	"	"	"	
<b>REX-9 (22-28) (A3I0536-06RE1)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090650</b>			
Acenaphthene	ND	---	3.48	ug/kg dry	1	09/27/13 15:42	EPA 8270D P/P/P	
Acenaphthylene	ND	---	3.48	"	"	"	"	
Anthracene	ND	---	3.48	"	"	"	"	
Benzo(a)anthracene	ND	---	3.48	"	"	"	"	
Benzo(a)pyrene	ND	---	5.22	"	"	"	"	
Benzo(b)fluoranthene	ND	---	5.22	"	"	"	"	
Benzo(k)fluoranthene	ND	---	5.22	"	"	"	"	
Benzo(g,h,i)perylene	ND	---	3.48	"	"	"	"	
Chrysene	ND	---	3.48	"	"	"	"	
Dibenz(a,h)anthracene	ND	---	3.48	"	"	"	"	
Fluoranthene	ND	---	3.48	"	"	"	"	
Fluorene	ND	---	3.48	"	"	"	"	
Indeno(1,2,3-cd)pyrene	ND	---	3.48	"	"	"	"	
1-Methylnaphthalene	ND	---	6.96	"	"	"	"	
2-Methylnaphthalene	ND	---	6.96	"	"	"	"	
Naphthalene	ND	---	6.96	"	"	"	"	
Phenanthrene	ND	---	3.48	"	"	"	"	
Pyrene	ND	---	3.48	"	"	"	"	
Carbazole	ND	---	5.22	"	"	"	"	
Dibenzofuran	ND	---	3.48	"	"	"	"	
4-Chloro-3-methylphenol	ND	---	34.8	"	"	"	"	
2-Chlorophenol	ND	---	17.4	"	"	"	"	

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Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 11:08

## ANALYTICAL SAMPLE RESULTS

### Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-9 (22-28) (A3I0536-06RE1)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090650</b>			
2,4-Dichlorophenol	ND	---	17.4	ug/kg dry	1	"	EPA 8270D P/P/P	
2,4-Dimethylphenol	ND	---	17.4	"	"	"	"	
2,4-Dinitrophenol	ND	---	69.6	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	---	209	"	"	"	"	
2-Methylphenol	ND	---	8.70	"	"	"	"	
3+4-Methylphenol(s)	ND	---	8.70	"	"	"	"	
2-Nitrophenol	ND	---	34.8	"	"	"	"	
4-Nitrophenol	ND	---	34.8	"	"	"	"	
Pentachlorophenol (PCP)	ND	---	34.8	"	"	"	"	
Phenol	ND	---	8.70	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	---	17.4	"	"	"	"	
2,4,5-Trichlorophenol	ND	---	17.4	"	"	"	"	
2,4,6-Trichlorophenol	ND	---	17.4	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	---	34.8	"	"	"	"	
Butyl benzyl phthalate	ND	---	34.8	"	"	"	"	
Diethylphthalate	ND	---	34.8	"	"	"	"	
Dimethylphthalate	ND	---	34.8	"	"	"	"	
Di-n-butylphthalate	ND	---	34.8	"	"	"	"	
Di-n-octyl phthalate	ND	---	69.6	"	"	"	"	
<i>Surrogate: Nitrobenzene-d5 (Surr)</i>			<i>Recovery: 84 %</i>	<i>Limits: 35-120 %</i>	"	"	"	
<i>2-Fluorobiphenyl (Surr)</i>			<i>83 %</i>	<i>Limits: 45-120 %</i>	"	"	"	
<i>Phenol-d6 (Surr)</i>			<i>86 %</i>	<i>Limits: 40-120 %</i>	"	"	"	
<i>p-Terphenyl-d14 (Surr)</i>			<i>101 %</i>	<i>Limits: 30-125 %</i>	"	"	"	
<i>2-Fluorophenol (Surr)</i>			<i>85 %</i>	<i>Limits: 35-120 %</i>	"	"	"	
<i>2,4,6-Tribromophenol (Surr)</i>			<i>65 %</i>	<i>Limits: 35-125 %</i>	"	"	"	

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Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 11:08

## ANALYTICAL SAMPLE RESULTS

## Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-4 (34-40) (A3I0536-01)</b> <b>Matrix: Soil</b>								
Batch: 3090653								
Antimony	ND	0.564	1.13	mg/kg dry	10	09/27/13 13:02	EPA 6020A	
<b>Cadmium</b>	<b>0.158</b>	0.113	0.226	"	"	"	"	J
<b>Chromium</b>	<b>10.9</b>	0.564	1.13	"	"	"	"	
<b>Copper</b>	<b>8.99</b>	0.564	1.13	"	"	"	"	
<b>Lead</b>	<b>3.82</b>	0.113	0.226	"	"	"	"	
<b>Nickel</b>	<b>11.5</b>	0.564	1.13	"	"	"	"	
<b>Zinc</b>	<b>45.7</b>	2.26	4.51	"	"	"	"	
<b>REX-5 (56-62) (A3I0536-02)</b> <b>Matrix: Soil</b>								
Batch: 3090653								
Antimony	ND	0.545	1.09	mg/kg dry	10	09/27/13 13:05	EPA 6020A	
<b>Cadmium</b>	<b>0.174</b>	0.109	0.218	"	"	"	"	J
<b>Chromium</b>	<b>7.34</b>	0.545	1.09	"	"	"	"	
<b>Copper</b>	<b>9.85</b>	0.545	1.09	"	"	"	"	
<b>Lead</b>	<b>4.15</b>	0.109	0.218	"	"	"	"	
<b>Nickel</b>	<b>9.29</b>	0.545	1.09	"	"	"	"	
<b>Zinc</b>	<b>50.7</b>	2.18	4.36	"	"	"	"	
<b>REX-6 (9-15) (A3I0536-03)</b> <b>Matrix: Soil</b>								
Batch: 3090653								
Antimony	ND	0.551	1.10	mg/kg dry	10	09/27/13 13:08	EPA 6020A	
<b>Cadmium</b>	<b>0.210</b>	0.110	0.221	"	"	"	"	J
<b>Chromium</b>	<b>14.1</b>	0.551	1.10	"	"	"	"	
<b>Copper</b>	<b>28.0</b>	0.551	1.10	"	"	"	"	
<b>Lead</b>	<b>6.75</b>	0.110	0.221	"	"	"	"	
<b>Nickel</b>	<b>13.0</b>	0.551	1.10	"	"	"	"	
<b>Zinc</b>	<b>82.4</b>	2.21	4.41	"	"	"	"	
<b>REX-7 (12-18) (A3I0536-04)</b> <b>Matrix: Soil</b>								
Batch: 3090653								
Antimony	ND	0.533	1.07	mg/kg dry	10	09/27/13 13:10	EPA 6020A	
<b>Cadmium</b>	<b>0.213</b>	0.107	0.213	"	"	"	"	
<b>Chromium</b>	<b>8.01</b>	0.533	1.07	"	"	"	"	
<b>Copper</b>	<b>15.4</b>	0.533	1.07	"	"	"	"	
<b>Lead</b>	<b>25.5</b>	0.107	0.213	"	"	"	"	
<b>Nickel</b>	<b>9.80</b>	0.533	1.07	"	"	"	"	
<b>Zinc</b>	<b>78.6</b>	2.13	4.27	"	"	"	"	

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Page 9 of 28

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3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 11:08

## ANALYTICAL SAMPLE RESULTS

## Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
REX-8 (18-24) (A3I0536-05)			Matrix: Soil					
Batch: 3090653								
Antimony	ND	0.613	1.23	mg/kg dry	10	09/27/13 13:19	EPA 6020A	
Cadmium	ND	0.123	0.245	"	"	"	"	
Chromium	6.99	0.613	1.23	"	"	"	"	
Copper	22.7	0.613	1.23	"	"	"	"	
Lead	4.96	0.123	0.245	"	"	"	"	
Nickel	9.46	0.613	1.23	"	"	"	"	
Zinc	116	2.45	4.90	"	"	"	"	
REX-9 (22-28) (A3I0536-06)			Matrix: Soil					
Batch: 3090653								
Antimony	ND	0.595	1.19	mg/kg dry	10	09/27/13 13:22	EPA 6020A	
Cadmium	0.155	0.119	0.238	"	"	"	"	J
Chromium	5.80	0.595	1.19	"	"	"	"	
Copper	7.86	0.595	1.19	"	"	"	"	
Lead	3.79	0.119	0.238	"	"	"	"	
Nickel	7.80	0.595	1.19	"	"	"	"	
Zinc	37.7	2.38	4.76	"	"	"	"	
REX-10 (18-24) (A3I0536-07)			Matrix: Soil					
Batch: 3090653								
Antimony	ND	0.581	1.16	mg/kg dry	10	09/27/13 13:25	EPA 6020A	
Cadmium	0.163	0.116	0.233	"	"	"	"	J
Chromium	7.08	0.581	1.16	"	"	"	"	
Copper	6.64	0.581	1.16	"	"	"	"	
Lead	3.39	0.116	0.233	"	"	"	"	
Nickel	8.70	0.581	1.16	"	"	"	"	
Zinc	36.4	2.33	4.65	"	"	"	"	
REX-11 (22-28) (A3I0536-08)			Matrix: Soil					
Batch: 3090653								
Antimony	ND	0.528	1.06	mg/kg dry	10	09/27/13 13:27	EPA 6020A	
Cadmium	0.127	0.106	0.211	"	"	"	"	J
Chromium	5.30	0.528	1.06	"	"	"	"	
Copper	6.53	0.528	1.06	"	"	"	"	
Lead	3.45	0.106	0.211	"	"	"	"	
Nickel	8.28	0.528	1.06	"	"	"	"	
Zinc	36.1	2.11	4.22	"	"	"	"	

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Darrell Auvin For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 11:08

## ANALYTICAL SAMPLE RESULTS

Percent Dry Weight								
Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-4 (34-40) (A3I0536-01)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090660</b>			
% Solids	90.3	---	1.00	% by Weight	1	09/27/13 12:53	NWTPH-Dx	
<b>REX-5 (56-62) (A3I0536-02)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090660</b>			
% Solids	91.9	---	1.00	% by Weight	1	09/27/13 12:53	NWTPH-Dx	
<b>REX-6 (9-15) (A3I0536-03)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090660</b>			
% Solids	88.9	---	1.00	% by Weight	1	09/27/13 12:53	NWTPH-Dx	
<b>REX-7 (12-18) (A3I0536-04)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090660</b>			
% Solids	90.5	---	1.00	% by Weight	1	09/27/13 12:53	NWTPH-Dx	
<b>REX-8 (18-24) (A3I0536-05)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090660</b>			
% Solids	90.3	---	1.00	% by Weight	1	09/27/13 12:53	NWTPH-Dx	
<b>REX-9 (22-28) (A3I0536-06)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090660</b>			
% Solids	90.9	---	1.00	% by Weight	1	09/27/13 12:53	NWTPH-Dx	
<b>REX-10 (18-24) (A3I0536-07)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090660</b>			
% Solids	93.9	---	1.00	% by Weight	1	09/27/13 12:53	NWTPH-Dx	
<b>REX-11 (22-28) (A3I0536-08)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090660</b>			
% Solids	93.1	---	1.00	% by Weight	1	09/27/13 12:53	NWTPH-Dx	

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Portland, OR 97201Project: Pier 99  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
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## QUALITY CONTROL (QC) SAMPLE RESULTS

## Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch 3090652 - EPA 3546						Soil							
Blank (3090652-BLK1)						Prepared: 09/27/13 09:02		Analyzed: 09/27/13 15:16			C-07		
EPA 8082A													
Aroclor 1016	ND	---	8.33	ug/kg wet	1	---	---	---	---	---	---		
Aroclor 1221	ND	---	8.33	"	"	---	---	---	---	---	---		
Aroclor 1232	ND	---	8.33	"	"	---	---	---	---	---	---		
Aroclor 1242	ND	---	8.33	"	"	---	---	---	---	---	---		
Aroclor 1248	ND	---	8.33	"	"	---	---	---	---	---	---		
Aroclor 1254	ND	---	8.33	"	"	---	---	---	---	---	---		
Aroclor 1260	ND	---	8.33	"	"	---	---	---	---	---	---		
Aroclor 1262	ND	---	8.33	"	"	---	---	---	---	---	---		
Aroclor 1268	ND	---	8.33	"	"	---	---	---	---	---	---		
Surr: Decachlorobiphenyl (Surr)		Recovery: 104 %		Limits: 60-125 %		Dilution: 1x							
LCS (3090652-BS1)						Prepared: 09/27/13 09:02		Analyzed: 09/27/13 15:34			C-07		
EPA 8082A													
Aroclor 1016	259	---	10.0	ug/kg wet	1	250	---	104	40-140%	---	---		
Aroclor 1260	228	---	10.0	"	"	"	---	91	60-130%	---	---		
Surr: Decachlorobiphenyl (Surr)		Recovery: 101 %		Limits: 60-125 %		Dilution: 1x							
Duplicate (3090652-DUP1)						Prepared: 09/27/13 09:02		Analyzed: 09/27/13 15:52			C-07		
QC Source Sample: REX-9 (22-28) (A310536-06)													
EPA 8082A													
Aroclor 1016	ND	---	9.56	ug/kg dry	1	---	ND	---	---	---	30%		
Aroclor 1221	ND	---	9.56	"	"	---	ND	---	---	---	30%		
Aroclor 1232	ND	---	9.56	"	"	---	ND	---	---	---	30%		
Aroclor 1242	ND	---	9.56	"	"	---	ND	---	---	---	30%		
Aroclor 1248	ND	---	9.56	"	"	---	ND	---	---	---	30%		
Aroclor 1254	ND	---	9.56	"	"	---	ND	---	---	---	30%		
Aroclor 1260	ND	---	9.56	"	"	---	ND	---	---	---	30%		
Aroclor 1262	ND	---	9.56	"	"	---	ND	---	---	---	30%		
Aroclor 1268	ND	---	9.56	"	"	---	ND	---	---	---	30%		
Surr: Decachlorobiphenyl (Surr)		Recovery: 106 %		Limits: 60-125 %		Dilution: 1x							Q-23

Q-23

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Page 12 of 28

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Project Number: 1975-01  
Project Manager: John FoxwellReported:  
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## QUALITY CONTROL (QC) SAMPLE RESULTS

## Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090680 - EPA 3546/3640A (GPC)						Soil						
Blank (3090680-BLK1)				Prepared: 09/27/13 08:57				Analyzed: 09/30/13 10:42				C-05
EPA 8081B												
Aldrin	ND	---	1.43	ug/kg wet	1	---	---	---	---	---	---	
alpha-BHC	ND	---	1.43	"	"	---	---	---	---	---	---	
beta-BHC	ND	---	1.43	"	"	---	---	---	---	---	---	
delta-BHC	ND	---	1.43	"	"	---	---	---	---	---	---	
gamma-BHC (Lindane)	ND	---	1.43	"	"	---	---	---	---	---	---	
cis-Chlordane	ND	---	1.43	"	"	---	---	---	---	---	---	
trans-Chlordane	ND	---	1.43	"	"	---	---	---	---	---	---	
4,4'-DDD	ND	---	1.43	"	"	---	---	---	---	---	---	
4,4'-DDE	ND	---	1.43	"	"	---	---	---	---	---	---	
4,4'-DDT	ND	---	1.43	"	"	---	---	---	---	---	---	
Dieldrin	ND	---	1.43	"	"	---	---	---	---	---	---	
Endosulfan I	ND	---	1.43	"	"	---	---	---	---	---	---	
Endosulfan II	ND	---	1.43	"	"	---	---	---	---	---	---	
Endosulfan sulfate	ND	---	1.43	"	"	---	---	---	---	---	---	
Endrin	ND	---	1.43	"	"	---	---	---	---	---	---	
Endrin Aldehyde	ND	---	1.43	"	"	---	---	---	---	---	---	
Endrin ketone	ND	---	1.43	"	"	---	---	---	---	---	---	
Heptachlor	ND	---	1.43	"	"	---	---	---	---	---	---	
Heptachlor epoxide	ND	---	1.43	"	"	---	---	---	---	---	---	
Methoxychlor	ND	---	4.29	"	"	---	---	---	---	---	---	
Chlordane (Technical)	ND	---	42.9	"	"	---	---	---	---	---	---	
Toxaphene (Total)	ND	---	42.9	"	"	---	---	---	---	---	---	
Surr: 2,4,5,6-TCMX (Surr)		Recovery: 85 %		Limits: 50-125 %		Dilution: 1x						
Decachlorobiphenyl (Surr)		86 %		55-130 %		"						

**LCS (3090680-BS1)**

Prepared: 09/27/13 08:57 Analyzed: 09/30/13 11:00

**C-05**

<b>EPA 8081B</b>												
Aldrin	50.7	---	2.00	ug/kg wet	1	50.0	---	101	45-140%	---	---	
alpha-BHC	51.8	---	2.00	"	"	"	---	104	60-125%	---	---	
beta-BHC	49.4	---	2.00	"	"	"	---	99	"	---	---	
delta-BHC	50.7	---	2.00	"	"	"	---	101	55-130%	---	---	

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## QUALITY CONTROL (QC) SAMPLE RESULTS

### Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3090680 - EPA 3546/3640A (GPC)</b>						<b>Soil</b>						
<b>LCS (3090680-BS1)</b>						Prepared: 09/27/13 08:57	Analyzed: 09/30/13 11:00	<b>C-05</b>				
gamma-BHC (Lindane)	51.0	---	2.00	"	"	"	---	102	60-125%	---	---	
cis-Chlordane	51.7	---	2.00	"	"	"	---	103	60-120%	---	---	
trans-Chlordane	52.4	---	2.00	"	"	"	---	105	65-125%	---	---	
4,4'-DDD	58.2	---	2.00	"	"	"	---	116	30-135%	---	---	
4,4'-DDE	54.8	---	2.00	"	"	"	---	110	70-125%	---	---	
4,4'-DDT	64.2	---	2.00	"	"	"	---	128	45-140%	---	---	
Dieldrin	54.0	---	2.00	"	"	"	---	108	65-125%	---	---	
Endosulfan I	52.8	---	2.00	"	"	"	---	106	15-135%	---	---	
Endosulfan II	54.7	---	2.00	"	"	"	---	109	35-140%	---	---	
Endosulfan sulfate	54.6	---	2.00	"	"	"	---	109	60-135%	---	---	
Endrin	58.3	---	2.00	"	"	"	---	117	"	---	---	
Endrin Aldehyde	53.2	---	2.00	"	"	"	---	106	30-145%	---	---	
Endrin ketone	55.2	---	2.00	"	"	"	---	110	65-135%	---	---	
Heptachlor	54.0	---	2.00	"	"	"	---	108	50-140%	---	---	
Heptachlor epoxide	51.3	---	2.00	"	"	"	---	103	65-130%	---	---	
Methoxychlor	64.8	---	6.00	"	"	"	---	130	55-145%	---	---	

Surr: 2,4,5,6-TCMX (Surr)

Recovery: 83 %

Limits: 50-125 %

Dilution: 1x

Decachlorobiphenyl (Surr)

94 %

55-130 %

"

### Duplicate (3090680-DUP1)

Prepared: 09/27/13 08:57 Analyzed: 09/30/13 14:43

**C-05**

QC Source Sample: REX-9 (22-28) (A310536-06RE1)

### EPA 8081B

Aldrin	ND	---	1.72	ug/kg dry	1	---	ND	---	---	---	30%
alpha-BHC	ND	---	1.72	"	"	---	ND	---	---	---	30%
beta-BHC	ND	---	1.72	"	"	---	ND	---	---	---	30%
delta-BHC	ND	---	1.72	"	"	---	ND	---	---	---	30%
gamma-BHC (Lindane)	ND	---	1.72	"	"	---	ND	---	---	---	30%
cis-Chlordane	ND	---	1.72	"	"	---	ND	---	---	---	30%
trans-Chlordane	ND	---	1.72	"	"	---	ND	---	---	---	30%
4,4'-DDD	ND	---	1.72	"	"	---	ND	---	---	---	30%
4,4'-DDE	ND	---	1.72	"	"	---	ND	---	---	---	30%
4,4'-DDT	ND	---	1.72	"	"	---	ND	---	---	---	30%

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Project: **Pier 99**  
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Project Manager: John Foxwell

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## QUALITY CONTROL (QC) SAMPLE RESULTS

### Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090680 - EPA 3546/3640A (GPC)							Soil					
Duplicate (3090680-DUP1)					Prepared: 09/27/13 08:57			Analyzed: 09/30/13 14:43			C-05	
QC Source Sample: REX-9 (22-28) (A3I0536-06RE1)												
Dieldrin	ND	---	1.72	"	"	---	ND	---	---	---	30%	
Endosulfan I	ND	---	1.72	"	"	---	ND	---	---	---	30%	
Endosulfan II	ND	---	1.72	"	"	---	ND	---	---	---	30%	
Endosulfan sulfate	ND	---	1.72	"	"	---	ND	---	---	---	30%	
Endrin	ND	---	1.72	"	"	---	ND	---	---	---	30%	
Endrin Aldehyde	ND	---	1.72	"	"	---	ND	---	---	---	30%	
Endrin ketone	ND	---	1.72	"	"	---	ND	---	---	---	30%	
Heptachlor	ND	---	1.72	"	"	---	ND	---	---	---	30%	
Heptachlor epoxide	ND	---	1.72	"	"	---	ND	---	---	---	30%	
Methoxychlor	ND	---	5.16	"	"	---	ND	---	---	---	30%	
Chlordane (Technical)	ND	---	51.6	"	"	---	ND	---	---	---	30%	
Toxaphene (Total)	ND	---	51.6	"	"	---	ND	---	---	---	30%	
Surr: 2,4,5,6-TCMX (Surr)		Recovery: 77 %		Limits: 50-125 %		Dilution: 1x						
Decachlorobiphenyl (Surr)		99 %		55-130 %		"						

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 11:08

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090650 - EPA 3546						Soil						
Blank (3090650-BLK1)				Prepared: 09/27/13 08:59    Analyzed: 09/27/13 12:11								
EPA 8270D P/P/P												
Acenaphthene	ND	---	3.08	ug/kg wet	1	---	---	---	---	---	---	
Acenaphthylene	ND	---	3.08	"	"	---	---	---	---	---	---	
Anthracene	ND	---	3.08	"	"	---	---	---	---	---	---	
Benz(a)anthracene	ND	---	3.08	"	"	---	---	---	---	---	---	
Benzo(a)pyrene	ND	---	4.62	"	"	---	---	---	---	---	---	
Benzo(b)fluoranthene	ND	---	4.62	"	"	---	---	---	---	---	---	
Benzo(k)fluoranthene	ND	---	4.62	"	"	---	---	---	---	---	---	
Benzo(b+k)fluoranthene(s)	ND	---	9.23	"	"	---	---	---	---	---	---	
Benzo(g,h,i)perylene	ND	---	3.08	"	"	---	---	---	---	---	---	
Chrysene	ND	---	3.08	"	"	---	---	---	---	---	---	
Dibenz(a,h)anthracene	ND	---	3.08	"	"	---	---	---	---	---	---	
Fluoranthene	ND	---	3.08	"	"	---	---	---	---	---	---	
Fluorene	ND	---	3.08	"	"	---	---	---	---	---	---	
Indeno(1,2,3-cd)pyrene	ND	---	3.08	"	"	---	---	---	---	---	---	
1-Methylnaphthalene	ND	---	6.15	"	"	---	---	---	---	---	---	
2-Methylnaphthalene	ND	---	6.15	"	"	---	---	---	---	---	---	
Naphthalene	ND	---	6.15	"	"	---	---	---	---	---	---	
Phenanthrene	ND	---	3.08	"	"	---	---	---	---	---	---	
Pyrene	ND	---	3.08	"	"	---	---	---	---	---	---	
Carbazole	ND	---	4.62	"	"	---	---	---	---	---	---	
Dibenzofuran	ND	---	3.08	"	"	---	---	---	---	---	---	
4-Chloro-3-methylphenol	ND	---	30.8	"	"	---	---	---	---	---	---	
2-Chlorophenol	ND	---	15.4	"	"	---	---	---	---	---	---	
2,4-Dichlorophenol	ND	---	15.4	"	"	---	---	---	---	---	---	
2,4-Dimethylphenol	ND	---	15.4	"	"	---	---	---	---	---	---	
2,4-Dinitrophenol	ND	---	61.5	"	"	---	---	---	---	---	---	
4,6-Dinitro-2-methylphenol	ND	---	185	"	"	---	---	---	---	---	---	
2-Methylphenol	ND	---	7.69	"	"	---	---	---	---	---	---	
3+4-Methylphenol(s)	ND	---	7.69	"	"	---	---	---	---	---	---	
2-Nitrophenol	ND	---	30.8	"	"	---	---	---	---	---	---	

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Page 16 of 28

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Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 11:08

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090650 - EPA 3546						Soil						
Blank (3090650-BLK1)			Prepared: 09/27/13 08:59    Analyzed: 09/27/13 12:11									
4-Nitrophenol	ND	---	30.8	ug/kg wet	"	---	---	---	---	---	---	B-02
Pentachlorophenol (PCP)	ND	---	30.8	"	"	---	---	---	---	---	---	
Phenol	ND	---	7.69	"	"	---	---	---	---	---	---	
2,3,4,6-Tetrachlorophenol	ND	---	15.4	"	"	---	---	---	---	---	---	
2,4,5-Trichlorophenol	ND	---	15.4	"	"	---	---	---	---	---	---	
2,4,6-Trichlorophenol	ND	---	15.4	"	"	---	---	---	---	---	---	
Bis(2-ethylhexyl)phthalate	ND	---	30.8	"	"	---	---	---	---	---	---	
Butyl benzyl phthalate	ND	---	30.8	"	"	---	---	---	---	---	---	
Diethylphthalate	ND	---	30.8	"	"	---	---	---	---	---	---	
Dimethylphthalate	ND	---	30.8	"	"	---	---	---	---	---	---	
Di-n-butylphthalate	ND	---	30.8	"	"	---	---	---	---	---	---	
Di-n-octyl phthalate	ND	---	61.5	"	"	---	---	---	---	---	---	
Surr: Nitrobenzene-d5 (Surr)		Recovery: 91 %		Limits: 35-120 %		Dilution: 1x						
2-Fluorobiphenyl (Surr)		87 %		45-120 %		"						
Phenol-d6 (Surr)		105 %		40-120 %		"						
p-Terphenyl-d14 (Surr)		101 %		30-125 %		"						
2-Fluorophenol (Surr)		102 %		35-120 %		"						
2,4,6-Tribromophenol (Surr)		76 %		35-125 %		"						
LCS (3090650-BS1)						Prepared: 09/27/13 08:59    Analyzed: 09/27/13 12:46						
EPA 8270D P/P/P												
Acenaphthene	714	---	4.00	ug/kg wet	1	800	---	89	45-120%	---	---	
Acenaphthylene	744	---	4.00	"	"	"	---	93	"	---	---	
Anthracene	776	---	4.00	"	"	"	---	97	55-120%	---	---	
Benz(a)anthracene	776	---	4.00	"	"	"	---	97	50-120%	---	---	
Benzo(a)pyrene	788	---	6.00	"	"	"	---	98	"	---	---	
Benzo(b)fluoranthene	797	---	6.00	"	"	"	---	100	45-120%	---	---	
Benzo(k)fluoranthene	781	---	6.00	"	"	"	---	98	45-125%	---	---	
Benzo(b+k)fluoranthene(s)	1570	---	12.0	"	"	1600	---	98	"	---	---	
Benzo(g,h,i)perylene	729	---	4.00	"	"	800	---	91	40-125%	---	---	
Chrysene	746	---	4.00	"	"	"	---	93	55-120%	---	---	
Dibenz(a,h)anthracene	782	---	4.00	"	"	"	---	98	40-125%	---	---	

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Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 11:08

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3090650 - EPA 3546</b>							<b>Soil</b>					
<b>LCS (3090650-BS1)</b>							Prepared: 09/27/13 08:59 Analyzed: 09/27/13 12:46					
Fluoranthene	807	---	4.00	ug/kg wet	"	"	---	101	55-120%	---	---	
Fluorene	735	---	4.00	"	"	"	---	92	50-120%	---	---	
Indeno(1,2,3-cd)pyrene	761	---	4.00	"	"	"	---	95	40-120%	---	---	
1-Methylnaphthalene	717	---	8.00	"	"	"	---	90	45-120%	---	---	
2-Methylnaphthalene	742	---	8.00	"	"	"	---	93	"	---	---	
Naphthalene	692	---	8.00	"	"	"	---	86	40-120%	---	---	
Phenanthrene	713	---	4.00	"	"	"	---	89	50-120%	---	---	
Pyrene	772	---	4.00	"	"	"	---	97	45-120%	---	---	
Carbazole	783	---	6.00	"	"	"	---	98	"	---	---	
Dibenzofuran	726	---	4.00	"	"	"	---	91	50-120%	---	---	
4-Chloro-3-methylphenol	742	---	40.0	"	"	"	---	93	45-120%	---	---	
2-Chlorophenol	769	---	20.0	"	"	"	---	96	"	---	---	
2,4-Dichlorophenol	709	---	20.0	"	"	"	---	89	"	---	---	
2,4-Dimethylphenol	789	---	20.0	"	"	"	---	99	30-120%	---	---	
2,4-Dinitrophenol	682	---	80.0	"	"	"	---	85	15-130%	---	---	
4,6-Dinitro-2-methylphenol	667	---	240	"	"	"	---	83	30-135%	---	---	
2-Methylphenol	724	---	10.0	"	"	"	---	91	40-120%	---	---	
3+4-Methylphenol(s)	777	---	10.0	"	"	"	---	97	"	---	---	
2-Nitrophenol	732	---	40.0	"	"	"	---	92	"	---	---	
4-Nitrophenol	718	---	40.0	"	"	"	---	90	15-140%	---	---	
Pentachlorophenol (PCP)	666	---	40.0	"	"	"	---	83	25-120%	---	---	
Phenol	826	---	10.0	"	"	"	---	103	40-120%	---	---	B-02, Q-41
2,3,4,6-Tetrachlorophenol	684	---	20.0	"	"	"	---	85	"	---	---	
2,4,5-Trichlorophenol	706	---	20.0	"	"	"	---	88	50-120%	---	---	
2,4,6-Trichlorophenol	718	---	20.0	"	"	"	---	90	45-120%	---	---	
Bis(2-ethylhexyl)phthalate	751	---	40.0	"	"	"	---	94	45-125%	---	---	
Butyl benzyl phthalate	792	---	40.0	"	"	"	---	99	50-125%	---	---	
Diethylphthalate	799	---	40.0	"	"	"	---	100	50-120%	---	---	
Dimethylphthalate	739	---	40.0	"	"	"	---	92	"	---	---	
Di-n-butylphthalate	780	---	40.0	"	"	"	---	97	55-120%	---	---	
Di-n-octyl phthalate	829	---	80.0	"	"	"	---	104	40-130%	---	---	

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 11:08

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090650 - EPA 3546						Soil						
LCS (3090650-BS1)						Prepared: 09/27/13 08:59   Analyzed: 09/27/13 12:46						
Surr: Nitrobenzene-d5 (Surr)		Recovery: 93 %		Limits: 35-120 %		Dilution: 1x						
2-Fluorobiphenyl (Surr)		90 %		45-120 %		"						
Phenol-d6 (Surr)		107 %		40-120 %		"						
p-Terphenyl-d14 (Surr)		94 %		30-125 %		"						
2-Fluorophenol (Surr)		105 %		35-120 %		"						
2,4,6-Tribromophenol (Surr)		88 %		35-125 %		"						
Duplicate (3090650-DUP1)						Prepared: 09/27/13 08:59   Analyzed: 09/27/13 15:06						
QC Source Sample: REX-5 (56-62) (A310536-02)												
EPA 8270D P/P/P												
Acenaphthene	ND	---	3.42	ug/kg dry	1	---	ND	---	---	---	30%	
Acenaphthylene	ND	---	3.42	"	"	---	ND	---	---	---	30%	
Anthracene	ND	---	3.42	"	"	---	ND	---	---	---	30%	
Benz(a)anthracene	ND	---	3.42	"	"	---	ND	---	---	---	30%	
Benzo(a)pyrene	ND	---	5.14	"	"	---	ND	---	---	---	30%	
Benzo(b)fluoranthene	ND	---	5.14	"	"	---	ND	---	---	---	30%	
Benzo(k)fluoranthene	ND	---	5.14	"	"	---	ND	---	---	---	30%	
Benzo(b+k)fluoranthene(s)	ND	---	10.3	"	"	---	ND	---	---	---	30%	
Benzo(g,h,i)perylene	ND	---	3.42	"	"	---	ND	---	---	---	30%	
Chrysene	ND	---	3.42	"	"	---	ND	---	---	---	30%	
Dibenz(a,h)anthracene	ND	---	3.42	"	"	---	ND	---	---	---	30%	
Fluoranthene	ND	---	3.42	"	"	---	ND	---	---	---	30%	
Fluorene	ND	---	3.42	"	"	---	ND	---	---	---	30%	
Indeno(1,2,3-cd)pyrene	ND	---	3.42	"	"	---	ND	---	---	---	30%	
1-Methylnaphthalene	ND	---	6.85	"	"	---	ND	---	---	---	30%	
2-Methylnaphthalene	ND	---	6.85	"	"	---	ND	---	---	---	30%	
Naphthalene	ND	---	6.85	"	"	---	ND	---	---	---	30%	
Phenanthrene	ND	---	3.42	"	"	---	ND	---	---	---	30%	
Pyrene	ND	---	3.42	"	"	---	ND	---	---	---	30%	
Carbazole	ND	---	5.14	"	"	---	ND	---	---	---	30%	
Dibenzofuran	ND	---	3.42	"	"	---	ND	---	---	---	30%	
4-Chloro-3-methylphenol	ND	---	34.2	"	"	---	ND	---	---	---	30%	

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 11:08

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090650 - EPA 3546						Soil						
Duplicate (3090650-DUP1)						Prepared: 09/27/13 08:59		Analyzed: 09/27/13 15:06				
QC Source Sample: REX-5 (56-62) (A310536-02)												
2-Chlorophenol	ND	---	17.1	ug/kg dry	"	---	ND	---	---	---	30%	
2,4-Dichlorophenol	ND	---	17.1	"	"	---	ND	---	---	---	30%	
2,4-Dimethylphenol	ND	---	17.1	"	"	---	ND	---	---	---	30%	
2,4-Dinitrophenol	ND	---	68.5	"	"	---	ND	---	---	---	30%	
4,6-Dinitro-2-methylphenol	ND	---	205	"	"	---	ND	---	---	---	30%	
2-Methylphenol	ND	---	8.56	"	"	---	ND	---	---	---	30%	
3+4-Methylphenol(s)	ND	---	8.56	"	"	---	ND	---	---	---	30%	
2-Nitrophenol	ND	---	34.2	"	"	---	ND	---	---	---	30%	
4-Nitrophenol	ND	---	34.2	"	"	---	ND	---	---	---	30%	
Pentachlorophenol (PCP)	ND	---	34.2	"	"	---	ND	---	---	---	30%	
Phenol	ND	---	8.56	"	"	---	ND	---	---	---	30%	
2,3,4,6-Tetrachlorophenol	ND	---	17.1	"	"	---	ND	---	---	---	30%	
2,4,5-Trichlorophenol	ND	---	17.1	"	"	---	ND	---	---	---	30%	
2,4,6-Trichlorophenol	ND	---	17.1	"	"	---	ND	---	---	---	30%	
Bis(2-ethylhexyl)phthalate	ND	---	34.2	"	"	---	ND	---	---	---	30%	
Butyl benzyl phthalate	ND	---	34.2	"	"	---	ND	---	---	---	30%	
Diethylphthalate	ND	---	34.2	"	"	---	ND	---	---	---	30%	
Dimethylphthalate	ND	---	34.2	"	"	---	ND	---	---	---	30%	
Di-n-butylphthalate	ND	---	34.2	"	"	---	ND	---	---	---	30%	
Di-n-octyl phthalate	ND	---	68.5	"	"	---	ND	---	---	---	30%	

<i>Surr: Nitrobenzene-d5 (Surr)</i>	<i>Recovery: 77 %</i>	<i>Limits: 35-120 %</i>	<i>Dilution: 1x</i>
<i>2-Fluorobiphenyl (Surr)</i>	<i>77 %</i>	<i>45-120 %</i>	<i>"</i>
<i>Phenol-d6 (Surr)</i>	<i>77 %</i>	<i>40-120 %</i>	<i>"</i>
<i>p-Terphenyl-d14 (Surr)</i>	<i>81 %</i>	<i>30-125 %</i>	<i>"</i>
<i>2-Fluorophenol (Surr)</i>	<i>78 %</i>	<i>35-120 %</i>	<i>"</i>
<i>2,4,6-Tribromophenol (Surr)</i>	<i>65 %</i>	<i>35-125 %</i>	<i>"</i>

### Matrix Spike (3090650-MS1)

Prepared: 09/27/13 08:59 Analyzed: 09/27/13 16:17

### QC Source Sample: REX-9 (22-28) (A310536-06)

#### EPA 8270D P/P/P

Acenaphthene	692	---	3.48	ug/kg dry	1	695	ND	100	45-120%	---	---
--------------	-----	-----	------	-----------	---	-----	----	-----	---------	-----	-----

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 11:08

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090650 - EPA 3546						Soil						
Matrix Spike (3090650-MS1)						Prepared: 09/27/13 08:59    Analyzed: 09/27/13 16:17						
QC Source Sample: REX-9 (22-28) (A3I0536-06)												
Acenaphthylene	719	---	3.48	ug/kg dry	"	"	ND	103	"	---	---	
Anthracene	763	---	3.48	"	"	"	ND	110	55-120%	---	---	
Benz(a)anthracene	762	---	3.48	"	"	"	ND	110	50-120%	---	---	
Benzo(a)pyrene	747	---	5.21	"	"	"	ND	107	"	---	---	
Benzo(b)fluoranthene	745	---	5.21	"	"	"	ND	107	45-120%	---	---	
Benzo(k)fluoranthene	755	---	5.21	"	"	"	ND	109	45-125%	---	---	
Benzo(b+k)fluoranthene(s)	1490	---	10.4	"	"	1390	ND	108	"	---	---	
Benzo(g,h,i)perylene	723	---	3.48	"	"	695	ND	104	40-125%	---	---	
Chrysene	743	---	3.48	"	"	"	ND	107	55-120%	---	---	
Dibenz(a,h)anthracene	784	---	3.48	"	"	"	ND	113	40-125%	---	---	
Fluoranthene	762	---	3.48	"	"	"	ND	110	55-120%	---	---	
Fluorene	728	---	3.48	"	"	"	ND	105	50-120%	---	---	
Indeno(1,2,3-cd)pyrene	752	---	3.48	"	"	"	ND	108	40-120%	---	---	
1-Methylnaphthalene	692	---	6.95	"	"	"	ND	100	45-120%	---	---	
2-Methylnaphthalene	715	---	6.95	"	"	"	ND	103	"	---	---	
Naphthalene	662	---	6.95	"	"	"	ND	95	40-120%	---	---	
Phenanthrene	709	---	3.48	"	"	"	ND	102	50-120%	---	---	
Pyrene	724	---	3.48	"	"	"	ND	104	45-120%	---	---	
Carbazole	742	---	5.21	"	"	"	ND	107	"	---	---	
Dibenzofuran	701	---	3.48	"	"	"	ND	101	50-120%	---	---	
4-Chloro-3-methylphenol	673	---	34.8	"	"	"	ND	97	45-120%	---	---	
2-Chlorophenol	713	---	17.4	"	"	"	ND	102	"	---	---	
2,4-Dichlorophenol	661	---	17.4	"	"	"	ND	95	"	---	---	
2,4-Dimethylphenol	458	---	17.4	"	"	"	ND	66	30-120%	---	---	
2,4-Dinitrophenol	514	---	69.5	"	"	"	ND	74	15-130%	---	---	
4,6-Dinitro-2-methylphenol	574	---	209	"	"	"	ND	83	30-135%	---	---	
2-Methylphenol	576	---	8.69	"	"	"	ND	83	40-120%	---	---	
3+4-Methylphenol(s)	649	---	8.69	"	"	"	ND	93	"	---	---	
2-Nitrophenol	697	---	34.8	"	"	"	ND	100	"	---	---	
4-Nitrophenol	708	---	34.8	"	"	"	ND	102	15-140%	---	---	

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 11:08

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090650 - EPA 3546						Soil						
Matrix Spike (3090650-MS1)						Prepared: 09/27/13 08:59		Analyzed: 09/27/13 16:17				
QC Source Sample: REX-9 (22-28) (A310536-06)												
Pentachlorophenol (PCP)	660	---	34.8	ug/kg dry	"	"	ND	95	25-120%	---	---	B-02, Q-41
Phenol	730	---	8.69	"	"	"	ND	105	40-120%	---	---	
2,3,4,6-Tetrachlorophenol	661	---	17.4	"	"	"	ND	95	"	---	---	
2,4,5-Trichlorophenol	676	---	17.4	"	"	"	ND	97	50-120%	---	---	
2,4,6-Trichlorophenol	658	---	17.4	"	"	"	ND	95	45-120%	---	---	
Bis(2-ethylhexyl)phthalate	815	---	34.8	"	"	"	ND	117	45-125%	---	---	
Butyl benzyl phthalate	824	---	34.8	"	"	"	ND	119	50-125%	---	---	
Diethylphthalate	793	---	34.8	"	"	"	ND	114	50-120%	---	---	
Dimethylphthalate	729	---	34.8	"	"	"	ND	105	"	---	---	
Di-n-butylphthalate	794	---	34.8	"	"	"	ND	114	55-120%	---	---	
Di-n-octyl phthalate	852	---	69.5	"	"	"	ND	123	40-130%	---	---	
Surr: Nitrobenzene-d5 (Surr)		Recovery:		105 %		Limits:		35-120 %		Dilution: 1x		
2-Fluorobiphenyl (Surr)				95 %				45-120 %		"		
Phenol-d6 (Surr)				112 %				40-120 %		"		
p-Terphenyl-d14 (Surr)				106 %				30-125 %		"		
2-Fluorophenol (Surr)				104 %				35-120 %		"		
2,4,6-Tribromophenol (Surr)				100 %				35-125 %		"		

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 11:08

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090653 - EPA 3051A						Soil						
Blank (3090653-BLK1)						Prepared: 09/27/13 09:04		Analyzed: 09/27/13 12:56				
EPA 6020A												
Antimony	ND	0.500	1.00	mg/kg wet	10	---	---	---	---	---	---	
Cadmium	ND	0.100	0.200	"	"	---	---	---	---	---	---	
Chromium	ND	0.500	1.00	"	"	---	---	---	---	---	---	
Copper	ND	0.500	1.00	"	"	---	---	---	---	---	---	
Lead	ND	0.100	0.200	"	"	---	---	---	---	---	---	
Nickel	ND	0.500	1.00	"	"	---	---	---	---	---	---	
Zinc	ND	2.00	4.00	"	"	---	---	---	---	---	---	
LCS (3090653-BS1)						Prepared: 09/27/13 09:04		Analyzed: 09/27/13 12:59				
EPA 6020A												
Antimony	25.8	0.500	1.00	mg/kg wet	10	25.0	---	103	80-120%	---	---	
Cadmium	52.2	0.100	0.200	"	"	50.0	---	104	"	---	---	
Chromium	51.1	0.500	1.00	"	"	"	---	102	"	---	---	
Copper	53.7	0.500	1.00	"	"	"	---	107	"	---	---	
Lead	54.0	0.100	0.200	"	"	"	---	108	"	---	---	
Nickel	52.4	0.500	1.00	"	"	"	---	105	"	---	---	
Zinc	56.2	2.00	4.00	"	"	"	---	112	"	---	---	
Post Spike (3090653-PS1)						Prepared: 09/27/13 14:50		Analyzed: 09/27/13 15:19				
Lead	308			ug/L	10	196	116	98	80-120%		---	

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3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell**Reported:**  
10/22/13 11:08

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090660 - Total Solids (Dry Weight)							Soil					
Duplicate (3090660-DUP1)					Prepared: 09/27/13 09:58		Analyzed: 09/27/13 12:53					
QC Source Sample: REX-11 (22-28) (A3I0536-08)												
NWTPH-Dx												
% Solids	93.2	---	1.00	% by Weight	1	---	93.1	---	---	0.1	20%	

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

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Darrell Auvil For Darwin Thomas, Business Development Director

Page 24 of 28

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 11:08

## SAMPLE PREPARATION INFORMATION

### Polychlorinated Biphenyls by EPA 8082A

#### Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3090652							
A3I0536-02	Soil	EPA 8082A	09/25/13 09:10	09/27/13 09:02	10.59g/5mL	10g/5mL	0.94
A3I0536-06	Soil	EPA 8082A	09/25/13 11:20	09/27/13 09:02	10.76g/5mL	10g/5mL	0.93

### Organochlorine Pesticides by EPA 8081B

#### Prep: EPA 3546/3640A (GPC)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3090680							
A3I0536-02RE1	Soil	EPA 8081B	09/25/13 09:10	09/27/13 08:57	13.46g/10mL	10g/5mL	1.49
A3I0536-06RE1	Soil	EPA 8081B	09/25/13 11:20	09/27/13 08:57	12.44g/10mL	10g/5mL	1.61

### Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

#### Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3090650							
A3I0536-02RE1	Soil	EPA 8270D P/P/P	09/25/13 09:10	09/27/13 08:59	12.91g/2mL	10g/2mL	0.78
A3I0536-06RE1	Soil	EPA 8270D P/P/P	09/25/13 11:20	09/27/13 08:59	12.64g/2mL	10g/2mL	0.79

### Total Metals by EPA 6020 (ICPMS)

#### Prep: EPA 3051A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3090653							
A3I0536-01	Soil	EPA 6020A	09/25/13 08:35	09/27/13 09:04	0.491g/50mL	0.5g/50mL	1.02
A3I0536-02	Soil	EPA 6020A	09/25/13 09:10	09/27/13 09:04	0.499g/50mL	0.5g/50mL	1.00
A3I0536-03	Soil	EPA 6020A	09/25/13 10:10	09/27/13 09:04	0.51g/50mL	0.5g/50mL	0.98
A3I0536-04	Soil	EPA 6020A	09/25/13 10:30	09/27/13 09:04	0.518g/50mL	0.5g/50mL	0.97
A3I0536-05	Soil	EPA 6020A	09/25/13 10:50	09/27/13 09:04	0.452g/50mL	0.5g/50mL	1.11
A3I0536-06	Soil	EPA 6020A	09/25/13 11:20	09/27/13 09:04	0.462g/50mL	0.5g/50mL	1.08
A3I0536-07	Soil	EPA 6020A	09/25/13 11:30	09/27/13 09:04	0.458g/50mL	0.5g/50mL	1.09
A3I0536-08	Soil	EPA 6020A	09/25/13 12:15	09/27/13 09:04	0.509g/50mL	0.5g/50mL	0.98

### Percent Dry Weight

#### Prep: Total Solids (Dry Weight)

Sample Default RL Prep

Apex Laboratories

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 11:08

## SAMPLE PREPARATION INFORMATION

Percent Dry Weight							
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
Batch: 3090660							
A3I0536-01	Soil	NWTPH-Dx	09/25/13 08:35	09/27/13 09:58	1N/A/1N/A	1N/A/1N/A	NA
A3I0536-02	Soil	NWTPH-Dx	09/25/13 09:10	09/27/13 09:58	1N/A/1N/A	1N/A/1N/A	NA
A3I0536-03	Soil	NWTPH-Dx	09/25/13 10:10	09/27/13 09:58	1N/A/1N/A	1N/A/1N/A	NA
A3I0536-04	Soil	NWTPH-Dx	09/25/13 10:30	09/27/13 09:58	1N/A/1N/A	1N/A/1N/A	NA
A3I0536-05	Soil	NWTPH-Dx	09/25/13 10:50	09/27/13 09:58	1N/A/1N/A	1N/A/1N/A	NA
A3I0536-06	Soil	NWTPH-Dx	09/25/13 11:20	09/27/13 09:58	1N/A/1N/A	1N/A/1N/A	NA
A3I0536-07	Soil	NWTPH-Dx	09/25/13 11:30	09/27/13 09:58	1N/A/1N/A	1N/A/1N/A	NA
A3I0536-08	Soil	NWTPH-Dx	09/25/13 12:15	09/27/13 09:58	1N/A/1N/A	1N/A/1N/A	NA

Apex Laboratories



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**Apex Companies, LLC**

3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**

Project Number: 1975-01  
Project Manager: John Foxwell

**Reported:**

10/22/13 11:08

## Notes and Definitions

### Qualifiers:

- B-02 Analyte detected in an associated blank at a level between one-half the MRL and the MRL. (See Notes and Conventions below.)
- C-05 Extract has undergone a GPC (Gel-Permeation Chromatography) cleanup per EPA 3640A. Reporting levels may be raised due to dilution necessary for cleanup. Sample Final Volume includes the GPC dilution factor, see the Prep page for details.
- C-07 Extract has undergone Sulfuric Acid Cleanup by EPA 3665A, Sulfur Cleanup by EPA 3660B, and Florisil Cleanup by EPA 3620B in order to minimize matrix interference.
- J Estimated Result. Result detected below the lowest point of the calibration curve, but above the specified MDL.
- Q-23 Recovery of Continuing Calibration Verification sample above upper control limit for this analyte. Data is likely biased high.
- Q-41 Estimated Results. Recovery of Continuing Calibration Verification sample above upper control limit for this analyte. Results are likely biased high.

### Notes and Conventions:

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.
- RPD Relative Percent Difference
- MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.
- WMSC Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.
- Batch QC Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.
- Blank Policy Apex assesses blank data for potential high bias down to a level equal to ½ the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.  
  
For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.  
  
Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.
- QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.
- \*\*\* Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Apex Laboratories



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**Reported:**  
10/22/13 11:08

**CHAIN OF CUSTODY RECORD**

**Client Name:** Apex Companies  
**Address:** 3015 SW First Ave  
**City/State/Zip:** Portland, OR 97201

**Project Manager:** John Foxwell

**Project Name:** Pier 99  
**Project Number:** 1975-01  
**Sampler Name:** Ian Maguire

**Analytical Lab:** Apex Analytical  
**Report To:** foxwell@apexcrs.com  
**Page:** 1 of 1

**Sample ID / Description**

Sample ID / Description	Date Sampled	Time Sampled	No. of Containers Shipped	Composite	Field Filtered	Preservative	Matrix	Analyte For:	Other (specify):
REX-4 (34-40)	9/25/13	835	2	X	X	X	Soil	Metals (see note 2)	Other (specify):
REX-5 (56-62)	9/25/13	910	2	X	X	X	Soil	Metals (see note 2)	Other (specify):
REX-6 (9-15)	9/25/13	1010	2	X	X	X	Soil	Metals (see note 2)	Other (specify):
REX-7 (12-18)	9/25/13	1030	2	X	X	X	Soil	Metals (see note 2)	Other (specify):
REX-8 (18-24)	9/25/13	1050	2	X	X	X	Soil	Metals (see note 2)	Other (specify):
REX-9 (22-28)	9/25/13	1120	2	X	X	X	Soil	Metals (see note 2)	Other (specify):
REX-10 (18-24)	9/25/13	1130	2	X	X	X	Soil	Metals (see note 2)	Other (specify):
REX-11 (22-28)	9/25/13	1215	2	X	X	X	Soil	Metals (see note 2)	Other (specify):

**Special Instructions:**

2. Metals list (antimony, cadmium, chromium, copper, lead, nickel, and zinc).

3. John Foxwell to coordinate turnaround with Darrell Auwil.

**Method of Shipment:**

Date	Time	Received by: Name/Company	Date	Time	Received by: Name/Company
9/25/13	1715	John Foxwell / Apex	9/25/13	1715	John Foxwell / Apex

**Relinquished by: Name/Company**

John Foxwell / Apex

**Relinquished by: Name/Company**

John Foxwell / Apex

**Relinquished by: Name/Company**

John Foxwell / Apex

Y N



**Analytical Resources, Incorporated**  
Analytical Chemists and Consultants

October 1, 2013

Darwin Thomas  
Apex Laboratories  
12232 SW Garden Place  
Tigard, OR 97223

**Client Project: A3I0536**  
**ARI Job No.: XG94**

Dear Mr. Thomas:

Please find enclosed the original Chain of Custody record (COC), sample receipt documentation, and the final data for the samples from the project referenced above.

Sample receipt information and analytical details are addressed in the Case Narrative.

An electronic copy of this report and all supporting raw data will be kept on file at ARI. Should you have any questions or concerns, please feel free to call me at your convenience.

Respectfully,  
ANALYTICAL RESOURCES, INC.

Cheronne Oreiro  
Project Manager  
(206) 695-6214  
[cheronneo@arilabs.com](mailto:cheronneo@arilabs.com)  
[www.arilabs.com](http://www.arilabs.com)

cc: eFile: XG94

Enclosures

## SUBCONTRACT ORDER

Apex Laboratories

A3I0536

XG94

9/26/13

SENDING LABORATORY:

Apex Laboratories  
12232 S.W. Garden Place  
Tigard, OR 97223  
Phone: (503) 718-2323  
Fax: (503) 718-0333  
Project Manager: Darwin Thomas

RECEIVING LABORATORY:

Analytical Resources, INC  
4611 S. 134th Place  
Tukwila, WA 98168  
Phone: (206) 695-6200  
Fax: (206) 695-6201

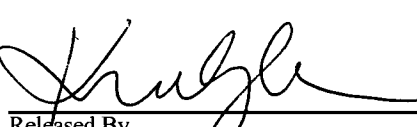
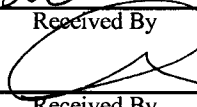
Sample Name: REX-5 (56-62) Soil Sampled: 09/25/13 09:10 (A3I0536-02)

Analysis	Due	Expires	Comments
Organotin Compounds (SUB)	10/04/13 17:00	03/24/14 09:10	RUSH 4-5 day TAT ---4 Butyltins/TBT, sub to ARI--
Containers Supplied: (C)4 oz Glass Jar			

Sample Name: REX-9 (22-28) Soil Sampled: 09/25/13 11:20 (A3I0536-06)

Analysis	Due	Expires	Comments
Organotin Compounds (SUB)	10/04/13 17:00	03/24/14 11:20	RUSH 4-5 day TAT ---4 Butyltins/TBT, sub to ARI--
Containers Supplied: (C)4 oz Glass Jar			

4-5 day TAT

Released By	Date	Received By	Date
	9/26/13 1500		9/27/13 1025
UPS (Shipper)		UPS (Shipper)	
Released By	Date	Received By	Date



# Cooler Receipt Form

ARI Client Apex

COC No(s): \_\_\_\_\_ (NA)

Assigned ARI Job No: XG94

Project Name: \_\_\_\_\_

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: \_\_\_\_\_

Tracking No: 1Z X472CR13 9981 7329 NA

## Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? \_\_\_\_\_

YES ☐ NO ☒

Were custody papers included with the cooler? \_\_\_\_\_

YES ☒ NO ☐

Were custody papers properly filled out (ink, signed, etc.) \_\_\_\_\_

YES ☒ NO ☐

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time: 1025

0.8

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 90877982

Cooler Accepted by: AV

Date: 9/27/13

Time: 1025

**Complete custody forms and attach all shipping documents**

## Log-In Phase:

Was a temperature blank included in the cooler? \_\_\_\_\_

YES ☒ NO ☐

What kind of packing material was used? ... ☒ Bubble Wrap ☒ Wet Ice ☒ Gel Packs ☒ Baggies ☐ Foam Block ☐ Paper ☐ Other: \_\_\_\_\_

Was sufficient ice used (if appropriate)? \_\_\_\_\_

NA ☒ YES ☐ NO ☐

Were all bottles sealed in individual plastic bags? \_\_\_\_\_

YES ☒ NO ☐

Did all bottles arrive in good condition (unbroken)? \_\_\_\_\_

YES ☒ NO ☐

Were all bottle labels complete and legible? \_\_\_\_\_

YES ☒ NO ☐

Did the number of containers listed on COC match with the number of containers received? \_\_\_\_\_

YES ☒ NO ☐

Did all bottle labels and tags agree with custody papers? \_\_\_\_\_

YES ☒ NO ☐

Were all bottles used correct for the requested analyses? \_\_\_\_\_

YES ☒ NO ☐

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...

NA ☒ YES ☐ NO ☐

Were all VOC vials free of air bubbles? \_\_\_\_\_

NA ☒ YES ☐ NO ☐

Was sufficient amount of sample sent in each bottle? \_\_\_\_\_

YES ☒ NO ☐

Date VOC Trip Blank was made at ARI: \_\_\_\_\_

NA ☒

Was Sample Split by ARI: ☒ YES

NA ☐

Date/Time: \_\_\_\_\_

Equipment: \_\_\_\_\_

Split by: \_\_\_\_\_

Samples Logged by AV

Date: 9/27/13

Time: 1205

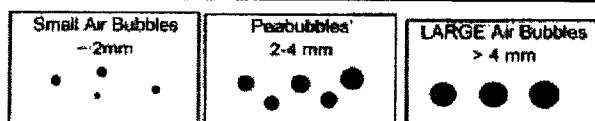
**\*\* Notify Project Manager of discrepancies or concerns \*\***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

## Additional Notes, Discrepancies, & Resolutions:

By: \_\_\_\_\_

Date: \_\_\_\_\_



Small → "sm" (< 2 mm)

Peabubbles → "pb" (2 to < 4 mm)

Large → "lg" (4 to < 6 mm)

Headspace → "hs" (> 6 mm)



## **Case Narrative**

**Client: Apex Laboratories**  
**Project: A3I0536**  
**ARI Job No.: XG94**

### **Sample Receipt**

Analytical Resources, Inc. (ARI) accepted two soil samples on September 27, 2013 under ARI job XG94. The cooler temperature measured by IR thermometer following ARI SOP was 0.8°C. For further details regarding sample receipt, please refer to the Cooler Receipt Form.

The samples were analyzed for parameters as requested on the COC.

### **Butyltins by Krone 1988 SIM**

There were no irregularities with this analysis.

# Sample ID Cross Reference Report



ARI Job No: XG94  
Client: Apex Laboratories  
Project Event: A3I0536  
Project Name: N/A

Sample ID	ARI		Matrix	Sample Date/Time	VTSR
	Lab ID	LIMS ID			
1. REX-5(56-62)	XG94A	13-20867	Soil	09/25/13 09:10	09/27/13 10:25
2. REX-9(22-28)	XG94B	13-20868	Soil	09/25/13 11:20	09/27/13 10:25

## ORGANICS ANALYSIS DATA SHEET

Tributyl Tins by Krone 1988 SIM GC/MS

Extraction Method: SW3546


Page 1 of 1

Sample ID: REX-5(56-62)  
SAMPLE

Lab Sample ID: XG94A

LIMS ID: 13-20867

Matrix: Soil

Data Release Authorized: 

Reported: 10/01/13

QC Report No: XG94-Apex Laboratories

Project: A3I0536

Event: NA

Date Sampled: 09/25/13

Date Received: 09/27/13

Date Extracted: 09/30/13

Date Analyzed: 10/01/13 12:23

Instrument/Analyst: NT12/VTS

Silica Gel Cleanup: No

Sample Amount: 5.57 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Alumina Cleanup: Yes

Moisture: 7.5%

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	Tributyltin Ion	0.9	3.5	< 3.5 U	
14488-53-0	Dibutyltin Ion	3.4	5.2	< 5.2 U	
<b>78763-54-9</b>	<b>Butyltin Ion</b>	<b>2.1</b>	<b>3.7</b>	<b>2.5 J</b>	
1461-25-2	Tetrabutyl Tin	4.5	4.5	< 4.5 U	

Reported in µg/kg (ppb)

**TBT Surrogate Recovery**

Tripropyl Tin Chloride	53.8%
Tripropyl Tin Chloride	63.6%

**ORGANICS ANALYSIS DATA SHEET**

**Tributyl Tins by Krone 1988 SIM GC/MS**

**Extraction Method: SW3546**

Page 1 of 1

**Sample ID: REX-9(22-28)**

**SAMPLE**

Lab Sample ID: XG94B

LIMS ID: 13-20868

Matrix: Soil

Data Release Authorized: *[Signature]*

Reported: 10/01/13

QC Report No: XG94-Apex Laboratories

Project: A3I0536

Event: NA

Date Sampled: 09/25/13

Date Received: 09/27/13

Date Extracted: 09/30/13

Date Analyzed: 10/01/13 12:37

Instrument/Analyst: NT12/VTS

Silica Gel Cleanup: No

Sample Amount: 5.47 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Alumina Cleanup: Yes

Moisture: 9.0%

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	Tributyltin Ion	0.9	3.5	< 3.5 U	
14488-53-0	Dibutyltin Ion	3.5	5.3	< 5.3 U	
78763-54-9	Butyltin Ion	2.1	3.7	< 3.7 U	
1461-25-2	Tetrabutyl Tin	4.6	4.6	< 4.6 U	

Reported in µg/kg (ppb)

**TBT Surrogate Recovery**

Tripropyl Tin Chloride	48.5%
Triphenyl Tin Chloride	64.5%

**TBT SURROGATE RECOVERY SUMMARY**

Matrix: Soil

QC Report No: XG94-Apex Laboratories  
Project: A3I0536  
Event: NA

<u>Client ID</u>	<u>TPRT</u>	<u>TPNT</u>	<u>TOT OUT</u>
MB-093013	59.0%	72.9%	0
LCS-093013	56.0%	68.4%	0
LCSD-093013	53.9%	66.6%	0
REX-5 (56-62)	53.8%	63.6%	0
REX-9 (22-28)	48.5%	64.5%	0

	<b>LCS/MB LIMITS</b>	<b>QC LIMITS</b>
(TPRT) = Tripropyl Tin Chloride	(28-106)	(32-104)
(TPNT) = Tripentyl Tin Chloride	(35-130)	(25-140)

Prep Method: SW3546  
Analytical Method: TBT (Hexyl) Krone 1988  
Log Number Range: 13-20867 to 13-20868

**ORGANICS ANALYSIS DATA SHEET**

**Tributyl Tins by Krone 1988 SIM GC/MS**

Page 1 of 1

**Sample ID: LCS-093013**

**LAB CONTROL SAMPLE**

Lab Sample ID: LCS-093013

LIMS ID: 13-20867

Matrix: Soil

Data Release Authorized: *B*

Reported: 10/01/13

QC Report No: XG94-Apex Laboratories

Project: A3I0536

Date Sampled: NA

Date Received: NA

Date Extracted LCS: 09/30/13

Sample Amount LCS: 5.00 g-dry-wt

LCSD: 5.00 g-dry-wt

Date Analyzed LCS: 10/01/13 11:55

Final Extract Volume LCS: 0.50 mL

LCSD: 10/01/13 12:09

LCSD: 0.50 mL

Instrument/Analyst LCS: NT12/VTs

Dilution Factor LCS: 1.00

LCSD: NT12/VTs

LCSD: 1.00

Silica Gel Cleanup: No

Alumina Cleanup: Yes

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Tributyltin Ion	32.2	44.6	72.2%	31.7	44.6	71.1%	1.6%
Dibutyltin Ion	25.1	38.4	65.4%	25.7	38.4	66.9%	2.4%
Butyltin Ion	19.1	31.2	61.2%	18.9	31.2	60.6%	1.1%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

**TBT Surrogate Recovery**

	LCS	LCSD
Tripropyl Tin Chloride	56.0%	53.9%
Triphenyl Tin Chloride	68.4%	66.6%

## ORGANICS ANALYSIS DATA SHEET

Tributyl Tins by Krone 1988 SIM GC/MS

Extraction Method: SW3546

Page 1 of 1


Sample ID: MB-093013

METHOD BLANK

Lab Sample ID: MB-093013

LIMS ID: 13-20867

Matrix: Soil

Data Release Authorized: 

Reported: 10/01/13

QC Report No: XG94-Apex Laboratories

Project: A3I0536

Event: NA

Date Sampled: NA

Date Received: NA

Date Extracted: 09/30/13

Date Analyzed: 10/01/13 11:41

Instrument/Analyst: NT12/VTS

Silica Gel Cleanup: No

Sample Amount: 5.00 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Alumina Cleanup: Yes

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	Tributyltin Ion	1.0	3.9	< 3.9 U	
14488-53-0	Dibutyltin Ion	3.8	5.8	< 5.8 U	
78763-54-9	Butyltin Ion	2.3	4.1	< 4.1 U	
1461-25-2	Tetrabutyl Tin	5.0	5.0	< 5.0 U	

Reported in µg/kg (ppb)

**TBT Surrogate Recovery**

Tripropyl Tin Chloride	59.0%
Triphenyl Tin Chloride	72.9%

# Apex Labs

12232 S.W. Garden Place  
Tigard, OR 97223  
503-718-2323 Phone  
503-718-0333 Fax

Tuesday, October 22, 2013

John Foxwell  
Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

RE: Pier 99 / 1975-01

Enclosed are the results of analyses for work order A310564, which was received by the laboratory on 9/26/2013 at 5:40:00PM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: [DAuvil@apex-labs.com](mailto:DAuvil@apex-labs.com), or by phone at 503-718-2323.

---

Apex Laboratories



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

---

Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 10:57

## ANALYTICAL REPORT FOR SAMPLES

### SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
REX-12 (0-6)	A3I0564-01	Soil	09/26/13 14:45	09/26/13 17:40
REX-13 (0-6)	A3I0564-02	Soil	09/26/13 15:15	09/26/13 17:40
REX-14 (0-6)	A3I0564-03	Soil	09/26/13 15:45	09/26/13 17:40
REX-14 (0-6) DUP	A3I0564-04	Soil	09/26/13 15:45	09/26/13 17:40

Apex Laboratories



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 10:57

## ANALYTICAL SAMPLE RESULTS

## Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-12 (0-6) (A3I0564-01) Matrix: Soil</b>								
Batch: 3090712								
Antimony	1.98	0.557	1.11	mg/kg dry	10	10/02/13 11:31	EPA 6020A	
Cadmium	0.702	0.111	0.223	"	"	"	"	
Chromium	17.4	0.557	1.11	"	"	"	"	
Copper	438	0.557	1.11	"	"	"	"	
Lead	129	0.111	0.223	"	"	"	"	
Nickel	15.4	0.557	1.11	"	"	"	"	
Zinc	342	2.23	4.45	"	"	"	"	
<b>REX-13 (0-6) (A3I0564-02) Matrix: Soil</b>								
Batch: 3090712								
Antimony	6.87	0.628	1.26	mg/kg dry	10	10/02/13 11:34	EPA 6020A	
Cadmium	3.25	0.126	0.251	"	"	"	"	
Chromium	49.6	0.628	1.26	"	"	"	"	
Copper	2970	0.628	1.26	"	"	"	"	
Lead	911	0.126	0.251	"	"	"	"	
Nickel	19.5	0.628	1.26	"	"	"	"	
Zinc	977	2.51	5.02	"	"	"	"	
<b>REX-14 (0-6) (A3I0564-03) Matrix: Soil</b>								
Batch: 3090712								
Antimony	ND	0.570	1.14	mg/kg dry	10	10/02/13 11:36	EPA 6020A	
Cadmium	2.59	0.114	0.228	"	"	"	"	
Chromium	11.8	0.570	1.14	"	"	"	"	
Copper	497	0.570	1.14	"	"	"	"	
Lead	96.0	0.114	0.228	"	"	"	"	
Nickel	12.5	0.570	1.14	"	"	"	"	
Zinc	412	2.28	4.56	"	"	"	"	
<b>REX-14 (0-6) DUP (A3I0564-04) Matrix: Soil</b>								
Batch: 3090712								
Antimony	0.663	0.518	1.04	mg/kg dry	10	10/02/13 11:39	EPA 6020A	J
Cadmium	2.02	0.104	0.207	"	"	"	"	
Chromium	14.5	0.518	1.04	"	"	"	"	
Copper	473	0.518	1.04	"	"	"	"	
Lead	103	0.104	0.207	"	"	"	"	
Nickel	15.3	0.518	1.04	"	"	"	"	
Zinc	433	2.07	4.14	"	"	"	"	

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 10:57

## ANALYTICAL SAMPLE RESULTS

Percent Dry Weight								
Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-12 (0-6) (A3I0564-01)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090717</b>			
% Solids	89.8	---	1.00	% by Weight	1	10/01/13 10:04	NWTPH-Dx	
<b>REX-13 (0-6) (A3I0564-02)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090717</b>			
% Solids	79.2	---	1.00	% by Weight	1	10/01/13 10:04	NWTPH-Dx	
<b>REX-14 (0-6) (A3I0564-03)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090717</b>			
% Solids	92.6	---	1.00	% by Weight	1	10/01/13 10:04	NWTPH-Dx	
<b>REX-14 (0-6) DUP (A3I0564-04)</b>			<b>Matrix: Soil</b>		<b>Batch: 3090717</b>			
% Solids	93.0	---	1.00	% by Weight	1	10/01/13 10:04	NWTPH-Dx	

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Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 10:57

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3090712 - EPA 3051A						Soil						
Blank (3090712-BLK1)						Prepared: 09/30/13 13:54		Analyzed: 10/02/13 10:37				
EPA 6020A												
Antimony	ND	0.500	1.00	mg/kg wet	10	---	---	---	---	---	---	
Cadmium	ND	0.100	0.200	"	"	---	---	---	---	---	---	
Chromium	ND	0.500	1.00	"	"	---	---	---	---	---	---	
Copper	ND	0.500	1.00	"	"	---	---	---	---	---	---	
Lead	ND	0.100	0.200	"	"	---	---	---	---	---	---	
Nickel	ND	0.500	1.00	"	"	---	---	---	---	---	---	
Zinc	ND	2.00	4.00	"	"	---	---	---	---	---	---	
LCS (3090712-BS1)						Prepared: 09/30/13 13:54		Analyzed: 10/02/13 10:45				
EPA 6020A												
Antimony	27.1	0.500	1.00	mg/kg wet	10	25.0	---	108	80-120%	---	---	
Cadmium	54.8	0.100	0.200	"	"	50.0	---	109	"	---	---	
Chromium	53.4	0.500	1.00	"	"	"	---	107	"	---	---	
Copper	55.9	0.500	1.00	"	"	"	---	112	"	---	---	
Lead	56.5	0.100	0.200	"	"	"	---	113	"	---	---	
Nickel	54.8	0.500	1.00	"	"	"	---	110	"	---	---	
Zinc	56.7	2.00	4.00	"	"	"	---	113	"	---	---	

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Page 5 of 9

Apex Companies, LLC  
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Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 10:57

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----	-----------------	-------	------	--------------	---------------	------	-------------	-----	-----------	-------

### Batch 3090717 - Total Solids (Dry Weight)

### Soil

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

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Page 6 of 9

Apex Companies, LLC  
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Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell**Reported:**  
10/22/13 10:57

## SAMPLE PREPARATION INFORMATION

## Total Metals by EPA 6020 (ICPMS)

**Prep: EPA 3051A**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<b>Batch: 3090712</b>							
A3I0564-01	Soil	EPA 6020A	09/26/13 14:45	09/30/13 13:54	0.5g/50mL	0.5g/50mL	1.00
A3I0564-02	Soil	EPA 6020A	09/26/13 15:15	09/30/13 13:54	0.503g/50mL	0.5g/50mL	0.99
A3I0564-03	Soil	EPA 6020A	09/26/13 15:45	09/30/13 13:54	0.474g/50mL	0.5g/50mL	1.05
A3I0564-04	Soil	EPA 6020A	09/26/13 15:45	09/30/13 13:54	0.519g/50mL	0.5g/50mL	0.96

## Percent Dry Weight

**Prep: Total Solids (Dry Weight)**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<b>Batch: 3090717</b>							
A3I0564-01	Soil	NWTPH-Dx	09/26/13 14:45	09/30/13 14:54	1N/A/1N/A	1N/A/1N/A	NA
A3I0564-02	Soil	NWTPH-Dx	09/26/13 15:15	09/30/13 14:54	1N/A/1N/A	1N/A/1N/A	NA
A3I0564-03	Soil	NWTPH-Dx	09/26/13 15:45	09/30/13 14:54	1N/A/1N/A	1N/A/1N/A	NA
A3I0564-04	Soil	NWTPH-Dx	09/26/13 15:45	09/30/13 14:54	1N/A/1N/A	1N/A/1N/A	NA

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 10:57

## Notes and Definitions

### Qualifiers:

J Estimated Result . Result detected below the lowest point of the calibration curve, but above the specified MDL.

### Notes and Conventions:

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.

RPD Relative Percent Difference

MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.

WMSC Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.

Batch QC Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.

Blank Policy Apex assesses blank data for potential high bias down to a level equal to ½ the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.

For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.

Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.

--- QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

\*\*\* Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

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Darrell Auvin For Darwin Thomas, Business Development Director

**Reported:**  
10/22/13 10:57

Page 9 of 9

Thursday, November 14, 2013

John Foxwell  
Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

RE: Pier 99 / 1975-01

Enclosed are the results of analyses for work order A3J0025, which was received by the laboratory on 10/1/2013 at 11:35:00AM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: [DAuvil@apex-labs.com](mailto:DAuvil@apex-labs.com), or by phone at 503-718-2323.

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell**Reported:**  
11/14/13 17:44

## ANALYTICAL REPORT FOR SAMPLES

## SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
REX-15 (0-6)	A3J0025-01	Soil	10/01/13 09:45	10/01/13 11:35
RAC-1 (0-6)	A3J0025-02	Soil	10/01/13 10:05	10/01/13 11:35
REX-16 (0-6)	A3J0025-03	Soil	10/01/13 10:20	10/01/13 11:35

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Page 2 of 39

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
11/14/13 17:44

## ANALYTICAL CASE NARRATIVE

### Work Order: A3J0025

Amended Report Revision 1:

This report has been amended from the original report.

Organochlorinated Pesticides by EPA 8081B and RCRA (8) metals by EPA 6020 methods were added to client sample, REX-16 (0-6, (Apex ID: A3J0025-03).

Darrell Auvil  
Project Manager  
November 14th, 2013

Apex Laboratories



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Page 3 of 39

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## ANALYTICAL SAMPLE RESULTS

## Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-15 (0-6) (A3J0025-01RE1)</b>			<b>Matrix: Soil</b>		<b>Batch: 3100052</b>			<b>C-07</b>
Aroclor 1016	ND	---	52.1	ug/kg dry	5	10/02/13 18:01	EPA 8082A	
Aroclor 1221	ND	---	52.1	"	"	"	"	
Aroclor 1232	ND	---	78.2	"	"	"	"	R-02
Aroclor 1242	ND	---	78.2	"	"	"	"	R-02
Aroclor 1248	ND	---	52.1	"	"	"	"	
<b>Aroclor 1254</b>	<b>554</b>	---	52.1	"	"	"	"	EST
<b>Aroclor 1260</b>	<b>164</b>	---	52.1	"	"	"	"	EST
Aroclor 1262	ND	---	52.1	"	"	"	"	
Aroclor 1268	ND	---	52.1	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl (Surr)</i>			<i>Recovery: 96 %</i>	<i>Limits: 60-125 %</i>	"	"	"	
<b>RAC-1 (0-6) (A3J0025-02)</b>			<b>Matrix: Soil</b>		<b>Batch: 3100052</b>			<b>C-07</b>
Aroclor 1016	ND	---	12.2	ug/kg dry	1	10/02/13 18:01	EPA 8082A	
Aroclor 1221	ND	---	12.2	"	"	"	"	
Aroclor 1232	ND	---	12.2	"	"	"	"	
Aroclor 1242	ND	---	12.2	"	"	"	"	
Aroclor 1248	ND	---	12.2	"	"	"	"	
Aroclor 1254	ND	---	12.2	"	"	"	"	
Aroclor 1260	ND	---	12.2	"	"	"	"	Q-42
Aroclor 1262	ND	---	12.2	"	"	"	"	
Aroclor 1268	ND	---	12.2	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl (Surr)</i>			<i>Recovery: 69 %</i>	<i>Limits: 60-125 %</i>	"	"	"	<u>Q-23</u>

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Page 4 of 39

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## ANALYTICAL SAMPLE RESULTS

## Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-15 (0-6) (A3J0025-01RE1)</b>			<b>Matrix: Soil</b>		<b>Batch: 3100067</b>			<b>C-05</b>
Aldrin	ND	---	20.5	ug/kg dry	10	10/03/13 12:14	EPA 8081B	
alpha-BHC	ND	---	20.5	"	"	"	"	
beta-BHC	ND	---	20.5	"	"	"	"	
delta-BHC	ND	---	20.5	"	"	"	"	
gamma-BHC (Lindane)	ND	---	20.5	"	"	"	"	
cis-Chlordane	ND	---	20.5	"	"	"	"	
trans-Chlordane	ND	---	20.5	"	"	"	"	
<b>4,4'-DDD</b>	<b>209</b>	---	20.5	"	"	"	"	Q-42
4,4'-DDE	ND	---	24.5	"	"	"	"	R-02
<b>4,4'-DDT</b>	<b>347</b>	---	20.5	"	"	"	"	
Dieldrin	ND	---	20.5	"	"	"	"	
Endosulfan I	ND	---	20.5	"	"	"	"	
Endosulfan II	ND	---	20.5	"	"	"	"	
Endosulfan sulfate	ND	---	20.5	"	"	"	"	
Endrin	ND	---	20.5	"	"	"	"	
Endrin Aldehyde	ND	---	20.5	"	"	"	"	
Endrin ketone	ND	---	20.5	"	"	"	"	
Heptachlor	ND	---	20.5	"	"	"	"	
<b>Heptachlor epoxide</b>	<b>28.5</b>	---	20.5	"	"	"	"	Q-42
Methoxychlor	ND	---	61.4	"	"	"	"	
Chlordane (Technical)	ND	---	614	"	"	"	"	
Toxaphene (Total)	ND	---	614	"	"	"	"	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 86 %</i>	<i>Limits: 50-125 %</i>	"	"	"	
<i>Decachlorobiphenyl (Surr)</i>			<i>108 %</i>	<i>Limits: 55-130 %</i>	"	"	"	

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: Pier 99  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## ANALYTICAL SAMPLE RESULTS

## Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-16 (0-6 (A3J0025-03RE1))</b>			<b>Matrix: Soil</b>		<b>Batch: 3110131</b>		<b>C-05, H-06, R-04</b>	
Aldrin	ND	---	19.2	ug/kg dry	10	11/06/13 13:48	EPA 8081B	
alpha-BHC	ND	---	19.2	"	"	"	"	
beta-BHC	ND	---	19.2	"	"	"	"	
delta-BHC	ND	---	19.2	"	"	"	"	
gamma-BHC (Lindane)	ND	---	19.2	"	"	"	"	
cis-Chlordane	ND	---	19.2	"	"	"	"	
trans-Chlordane	ND	---	19.2	"	"	"	"	
4,4'-DDD	ND	---	19.2	"	"	"	"	
4,4'-DDE	ND	---	19.2	"	"	"	"	
4,4'-DDT	ND	---	34.6	"	"	"	"	R-02
Dieldrin	ND	---	19.2	"	"	"	"	
Endosulfan I	ND	---	19.2	"	"	"	"	
Endosulfan II	ND	---	19.2	"	"	"	"	
Endosulfan sulfate	ND	---	19.2	"	"	"	"	
Endrin	ND	---	19.2	"	"	"	"	
Endrin Aldehyde	ND	---	19.2	"	"	"	"	
Endrin ketone	ND	---	19.2	"	"	"	"	
Heptachlor	ND	---	19.2	"	"	"	"	
Heptachlor epoxide	ND	---	19.2	"	"	"	"	
Methoxychlor	ND	---	57.6	"	"	"	"	
Chlordane (Technical)	ND	---	576	"	"	"	"	
Toxaphene (Total)	ND	---	576	"	"	"	"	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 70 %	Limits: 50-125 %	"	"	"	
Decachlorobiphenyl (Surr)			92 %	Limits: 55-130 %	"	"	"	

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Portland, OR 97201Project: Pier 99  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## ANALYTICAL SAMPLE RESULTS

## Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-15 (0-6) (A3J0025-01)</b>			<b>Matrix: Soil</b>	<b>Batch: 3100050</b>				
Benz(a)anthracene	ND	---	163	ug/kg dry	40	10/02/13 13:33	EPA 8270D P/P/P	
Benzo(a)pyrene	ND	---	244	"	"	"	"	
<b>Benzo(b)fluoranthene</b>	<b>244</b>	---	244	"	"	"	"	
Benzo(k)fluoranthene	ND	---	244	"	"	"	"	
Benzo(g,h,i)perylene	ND	---	163	"	"	"	"	
Chrysene	ND	---	163	"	"	"	"	
Dibenz(a,h)anthracene	ND	---	163	"	"	"	"	
Indeno(1,2,3-cd)pyrene	ND	---	163	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	---	1630	"	"	"	"	Q-42
Butyl benzyl phthalate	ND	---	1630	"	"	"	"	
Di-n-octyl phthalate	ND	---	3250	"	"	"	"	Q-42

Surrogate: p-Terphenyl-d14 (Surr)

Recovery: 81 %

Limits: 30-125 %

"

"

"

**REX-15 (0-6) (A3J0025-01RE1)****Matrix: Soil****Batch: 3100050**

Acenaphthene	ND	---	40.7	ug/kg dry	10	10/02/13 14:02	EPA 8270D P/P/P	
Acenaphthylene	ND	---	40.7	"	"	"	"	
Anthracene	ND	---	40.7	"	"	"	"	
<b>Fluoranthene</b>	<b>133</b>	---	40.7	"	"	"	"	
Fluorene	ND	---	40.7	"	"	"	"	
1-Methylnaphthalene	ND	---	81.3	"	"	"	"	
2-Methylnaphthalene	ND	---	81.3	"	"	"	"	
Naphthalene	ND	---	81.3	"	"	"	"	
<b>Phenanthrene</b>	<b>105</b>	---	40.7	"	"	"	"	
<b>Pyrene</b>	<b>123</b>	---	40.7	"	"	"	"	
Carbazole	ND	---	61.0	"	"	"	"	
Dibenzofuran	ND	---	40.7	"	"	"	"	
4-Chloro-3-methylphenol	ND	---	407	"	"	"	"	
2-Chlorophenol	ND	---	203	"	"	"	"	
2,4-Dichlorophenol	ND	---	203	"	"	"	"	
2,4-Dimethylphenol	ND	---	203	"	"	"	"	
2,4-Dinitrophenol	ND	---	813	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	---	2440	"	"	"	"	
2-Methylphenol	ND	---	102	"	"	"	"	
3+4-Methylphenol(s)	ND	---	102	"	"	"	"	
2-Nitrophenol	ND	---	407	"	"	"	"	
4-Nitrophenol	ND	---	407	"	"	"	"	

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: Pier 99  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## ANALYTICAL SAMPLE RESULTS

## Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-15 (0-6) (A3J0025-01RE1)</b>			<b>Matrix: Soil</b>	<b>Batch: 3100050</b>				
Pentachlorophenol (PCP)	ND	---	407	ug/kg dry	10	"	EPA 8270D P/P/P	
<b>Phenol</b>	<b>869</b>	---	102	"	"	"	"	B-02, Q-42
2,3,4,6-Tetrachlorophenol	ND	---	203	"	"	"	"	
2,4,5-Trichlorophenol	ND	---	203	"	"	"	"	
2,4,6-Trichlorophenol	ND	---	203	"	"	"	"	
Diethylphthalate	ND	---	407	"	"	"	"	
<b>Dimethylphthalate</b>	<b>2840</b>	---	407	"	"	"	"	Q-42
<b>Di-n-butylphthalate</b>	<b>482</b>	---	407	"	"	"	"	
<i>Surrogate: Nitrobenzene-d5 (Surr)</i>			<i>Recovery: 42 %</i>	<i>Limits: 35-120 %</i>	"	"	"	
<i>2-Fluorobiphenyl (Surr)</i>			<i>58 %</i>	<i>Limits: 45-120 %</i>	"	"	"	
<i>Phenol-d6 (Surr)</i>			<i>56 %</i>	<i>Limits: 40-120 %</i>	"	"	"	
<i>p-Terphenyl-d14 (Surr)</i>			<i>90 %</i>	<i>Limits: 30-125 %</i>	"	"	"	
<i>2-Fluorophenol (Surr)</i>			<i>47 %</i>	<i>Limits: 35-120 %</i>	"	"	"	
<i>2,4,6-Tribromophenol (Surr)</i>			<i>68 %</i>	<i>Limits: 35-125 %</i>	"	"	"	
<b>REX-16 (0-6) (A3J0025-03RE1)</b>			<b>Matrix: Soil</b>	<b>Batch: 3110193</b>				<b>H-06</b>
Acenaphthene	ND	---	98.6	ug/kg dry	10	11/08/13 15:38	EPA 8270D P/P/P	
Acenaphthylene	ND	---	98.6	"	"	"	"	
Anthracene	ND	---	98.6	"	"	"	"	
Benzo(a)anthracene	ND	---	98.6	"	"	"	"	
Benzo(a)pyrene	ND	---	148	"	"	"	"	
Benzo(b)fluoranthene	ND	---	148	"	"	"	"	
Benzo(k)fluoranthene	ND	---	148	"	"	"	"	
<b>Benzo(g,h,i)perylene</b>	<b>100</b>	---	98.6	"	"	"	"	
Chrysene	ND	---	98.6	"	"	"	"	
Dibenz(a,h)anthracene	ND	---	98.6	"	"	"	"	
Fluoranthene	ND	---	98.6	"	"	"	"	
Fluorene	ND	---	98.6	"	"	"	"	
Indeno(1,2,3-cd)pyrene	ND	---	98.6	"	"	"	"	
1-Methylnaphthalene	ND	---	197	"	"	"	"	
2-Methylnaphthalene	ND	---	197	"	"	"	"	
Naphthalene	ND	---	197	"	"	"	"	
Phenanthrene	ND	---	98.6	"	"	"	"	
Pyrene	ND	---	98.6	"	"	"	"	
Carbazole	ND	---	148	"	"	"	"	
Dibenzofuran	ND	---	98.6	"	"	"	"	

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Portland, OR 97201Project: Pier 99  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## ANALYTICAL SAMPLE RESULTS

## Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-16 (0-6 (A3J0025-03RE1))</b>			<b>Matrix: Soil</b>		<b>Batch: 3110193</b>			<b>H-06</b>
4-Chloro-3-methylphenol	ND	---	986	ug/kg dry	10	"	EPA 8270D P/P/P	
2-Chlorophenol	ND	---	493	"	"	"	"	
2,4-Dichlorophenol	ND	---	493	"	"	"	"	
2,4-Dimethylphenol	ND	---	493	"	"	"	"	
2,4-Dinitrophenol	ND	---	2020	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	---	5910	"	"	"	"	
2-Methylphenol	ND	---	246	"	"	"	"	
3+4-Methylphenol(s)	ND	---	246	"	"	"	"	
2-Nitrophenol	ND	---	986	"	"	"	"	
4-Nitrophenol	ND	---	986	"	"	"	"	
Pentachlorophenol (PCP)	ND	---	986	"	"	"	"	
Phenol	ND	---	296	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	---	493	"	"	"	"	
2,4,5-Trichlorophenol	ND	---	493	"	"	"	"	
2,4,6-Trichlorophenol	ND	---	493	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	---	986	"	"	"	"	
Butyl benzyl phthalate	ND	---	986	"	"	"	"	
Diethylphthalate	ND	---	986	"	"	"	"	
Dimethylphthalate	ND	---	986	"	"	"	"	
Di-n-butylphthalate	ND	---	986	"	"	"	"	
Di-n-octyl phthalate	ND	---	1970	"	"	"	"	
<i>Surrogate: Nitrobenzene-d5 (Surr)</i>			<i>Recovery: 91 %</i>	<i>Limits: 35-120 %</i>	"	"	"	
<i>2-Fluorobiphenyl (Surr)</i>			<i>78 %</i>	<i>Limits: 45-120 %</i>	"	"	"	
<i>Phenol-d6 (Surr)</i>			<i>102 %</i>	<i>Limits: 40-120 %</i>	"	"	"	<i>Q-41</i>
<i>p-Terphenyl-d14 (Surr)</i>			<i>91 %</i>	<i>Limits: 30-125 %</i>	"	"	"	
<i>2-Fluorophenol (Surr)</i>			<i>88 %</i>	<i>Limits: 35-120 %</i>	"	"	"	<i>Q-41</i>
<i>2,4,6-Tribromophenol (Surr)</i>			<i>90 %</i>	<i>Limits: 35-125 %</i>	"	"	"	

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Page 9 of 39

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Project Manager: John FoxwellReported:  
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## ANALYTICAL SAMPLE RESULTS

## Polyaromatic Hydrocarbons (PAHs) by EPA 8270D SIM

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>RAC-1 (0-6) (A3J0025-02RE1)</b>			<b>Matrix: Soil</b>		<b>Batch: 3100109</b>			
Acenaphthene	ND	---	10.6	ug/kg dry	1	10/04/13 23:18	EPA 8270D (SIM)	
Acenaphthylene	ND	---	10.6	"	"	"	"	
Anthracene	ND	---	10.6	"	"	"	"	
Benz(a)anthracene	ND	---	10.6	"	"	"	"	
Benzo(a)pyrene	ND	---	10.6	"	"	"	"	
Benzo(b+k)fluoranthene(s)	ND	---	21.2	"	"	"	"	Q-26
<b>Benzo(g,h,i)perylene</b>	<b>16.3</b>	---	10.6	"	"	"	"	
Chrysene	ND	---	10.6	"	"	"	"	
Dibenz(a,h)anthracene	ND	---	10.6	"	"	"	"	
Dibenzofuran	ND	---	10.6	"	"	"	"	
<b>Fluoranthene</b>	<b>12.9</b>	---	10.6	"	"	"	"	
Fluorene	ND	---	10.6	"	"	"	"	
<b>Indeno(1,2,3-cd)pyrene</b>	<b>11.7</b>	---	10.6	"	"	"	"	
1-Methylnaphthalene	ND	---	10.6	"	"	"	"	
2-Methylnaphthalene	ND	---	10.6	"	"	"	"	
<b>Naphthalene</b>	<b>11.3</b>	---	10.6	"	"	"	"	
<b>Phenanthrene</b>	<b>12.3</b>	---	10.6	"	"	"	"	
<b>Pyrene</b>	<b>13.7</b>	---	10.6	"	"	"	"	
<i>Surrogate: 2-Fluorobiphenyl (Surr)</i>			<i>Recovery: 77 %</i>	<i>Limits: 45-120 %</i>	"	"	"	
<i>p-Terphenyl-d14 (Surr)</i>			<i>84 %</i>	<i>Limits: 30-120 %</i>	"	"	"	

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## ANALYTICAL SAMPLE RESULTS

## Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-15 (0-6) (A3J0025-01)</b> <b>Matrix: Soil</b>								
Batch: 3100055								
Antimony	3.16	0.568	1.14	mg/kg dry	10	10/02/13 12:52	EPA 6020A	
Cadmium	1.17	0.114	0.227	"	"	"	"	
Chromium	16.4	0.568	1.14	"	"	"	"	
Copper	2150	0.568	1.14	"	"	"	"	
Lead	264	0.114	0.227	"	"	"	"	
Nickel	9.76	0.568	1.14	"	"	"	"	
Zinc	160	2.27	4.55	"	"	"	"	
<b>RAC-1 (0-6) (A3J0025-02)</b> <b>Matrix: Soil</b>								
Batch: 3100055								
Antimony	0.609	0.609	1.22	mg/kg dry	10	10/02/13 12:55	EPA 6020A	J
Cadmium	1.33	0.122	0.243	"	"	"	"	
Chromium	11.9	0.609	1.22	"	"	"	"	
Copper	28.6	0.609	1.22	"	"	"	"	
Lead	26.7	0.122	0.243	"	"	"	"	
Nickel	14.9	0.609	1.22	"	"	"	"	
Zinc	144	2.43	4.87	"	"	"	"	
<b>REX-16 (0-6) (A3J0025-03)</b> <b>Matrix: Soil</b>								
Batch: 3110116								
Arsenic	9.72	---	1.23	mg/kg dry	10	11/05/13 16:34	EPA 6020A	
Barium	157	---	1.23	"	"	"	"	
Cadmium	18.1	0.123	1.11	"	"	"	"	
Chromium	46.1	0.617	1.23	"	"	"	"	
Lead	1060	0.123	1.11	"	"	"	"	
Mercury	0.486	---	0.0987	"	"	"	"	H-02
Selenium	ND	---	1.23	"	"	"	"	
Silver	ND	---	1.11	"	"	"	"	

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11/14/13 17:44

## ANALYTICAL SAMPLE RESULTS

## Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-15 (0-6) (A3J0025-01)</b>			<b>Matrix: Soil</b>		<b>Batch: 3100032</b>			
% Solids	92.6	---	1.00	% by Weight	1	10/02/13 10:01	EPA 8000C	
<b>RAC-1 (0-6) (A3J0025-02)</b>			<b>Matrix: Soil</b>		<b>Batch: 3100032</b>			
% Solids	81.5	---	1.00	% by Weight	1	10/02/13 10:01	EPA 8000C	
<b>REX-16 (0-6) (A3J0025-03)</b>			<b>Matrix: Soil</b>		<b>Batch: 3100893</b>			
% Solids	90.1	---	1.00	% by Weight	1	10/31/13 10:19	EPA 8000C	

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Page 12 of 39

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Project Manager: John FoxwellReported:  
11/14/13 17:44

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3100052 - EPA 3546						Soil						
Blank (3100052-BLK1)						Prepared: 10/02/13 08:21		Analyzed: 10/02/13 15:54			C-07	
EPA 8082A												
Aroclor 1016	ND	---	8.33	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1221	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1232	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1242	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1248	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1254	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1260	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1262	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1268	ND	---	8.33	"	"	---	---	---	---	---	---	
Surr: Decachlorobiphenyl (Surr)		Recovery: 105 %		Limits: 60-125 %		Dilution: 1x		Q-23				
LCS (3100052-BS1)						Prepared: 10/02/13 08:21		Analyzed: 10/02/13 16:12			C-07	
EPA 8082A												
Aroclor 1016	224	---	10.0	ug/kg wet	1	250	---	90	40-140%	---	---	
Aroclor 1260	238	---	10.0	"	"	"	---	95	60-130%	---	---	
Surr: Decachlorobiphenyl (Surr)		Recovery: 110 %		Limits: 60-125 %		Dilution: 1x		Q-23				
Matrix Spike (3100052-MS1)						Prepared: 10/02/13 08:21		Analyzed: 10/02/13 18:19			C-07	
QC Source Sample: RAC-1 (0-6) (A3J0025-02)												
EPA 8082A												
Aroclor 1016	193	---	11.7	ug/kg dry	1	293	ND	66	40-140%	---	---	
Aroclor 1260	170	---	11.7	"	"	"	ND	58	60-130%	---	---	Q-01
Surr: Decachlorobiphenyl (Surr)		Recovery: 69 %		Limits: 60-125 %		Dilution: 1x		Q-23				

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Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3100067 - EPA 3546/3640A (GPC)						Soil						
Blank (3100067-BLK1)				Prepared: 10/02/13 08:20				Analyzed: 10/03/13 10:03				C-05
EPA 8081B												
Aldrin	ND	---	1.82	ug/kg wet	1	---	---	---	---	---	---	
alpha-BHC	ND	---	1.82	"	"	---	---	---	---	---	---	
beta-BHC	ND	---	1.82	"	"	---	---	---	---	---	---	
delta-BHC	ND	---	1.82	"	"	---	---	---	---	---	---	
gamma-BHC (Lindane)	ND	---	1.82	"	"	---	---	---	---	---	---	
cis-Chlordane	ND	---	1.82	"	"	---	---	---	---	---	---	
trans-Chlordane	ND	---	1.82	"	"	---	---	---	---	---	---	
4,4'-DDD	ND	---	1.82	"	"	---	---	---	---	---	---	
4,4'-DDE	ND	---	1.82	"	"	---	---	---	---	---	---	
4,4'-DDT	ND	---	1.82	"	"	---	---	---	---	---	---	
Dieldrin	ND	---	1.82	"	"	---	---	---	---	---	---	
Endosulfan I	ND	---	1.82	"	"	---	---	---	---	---	---	
Endosulfan II	ND	---	1.82	"	"	---	---	---	---	---	---	
Endosulfan sulfate	ND	---	1.82	"	"	---	---	---	---	---	---	
Endrin	ND	---	1.82	"	"	---	---	---	---	---	---	
Endrin Aldehyde	ND	---	1.82	"	"	---	---	---	---	---	---	
Endrin ketone	ND	---	1.82	"	"	---	---	---	---	---	---	
Heptachlor	ND	---	1.82	"	"	---	---	---	---	---	---	
Heptachlor epoxide	ND	---	1.82	"	"	---	---	---	---	---	---	
Methoxychlor	ND	---	5.45	"	"	---	---	---	---	---	---	
Chlordane (Technical)	ND	---	54.5	"	"	---	---	---	---	---	---	
Toxaphene (Total)	ND	---	54.5	"	"	---	---	---	---	---	---	
Surr: 2,4,5,6-TCMX (Surr)		Recovery: 86 %		Limits: 50-125 %		Dilution: 1x						
Decachlorobiphenyl (Surr)		91 %		55-130 %		"						

## LCS (3100067-BS1)

Prepared: 10/02/13 08:20 Analyzed: 10/03/13 10:21

C-05

<b>EPA 8081B</b>												
Aldrin	39.1	---	2.00	ug/kg wet	1	50.0	---	78	45-140%	---	---	
alpha-BHC	39.6	---	2.00	"	"	"	---	79	60-125%	---	---	
beta-BHC	37.6	---	2.00	"	"	"	---	75	"	---	---	
delta-BHC	41.0	---	2.00	"	"	"	---	82	55-130%	---	---	

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## QUALITY CONTROL (QC) SAMPLE RESULTS

## Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3100067 - EPA 3546/3640A (GPC)							Soil					
LCS (3100067-BS1)				Prepared: 10/02/13 08:20			Analyzed: 10/03/13 10:21				C-05	
gamma-BHC (Lindane)	40.4	---	2.00	"	"	"	---	81	60-125%	---	---	
cis-Chlordane	40.4	---	2.00	"	"	"	---	81	60-120%	---	---	
trans-Chlordane	41.0	---	2.00	"	"	"	---	82	65-125%	---	---	
4,4'-DDD	45.3	---	2.00	"	"	"	---	91	30-135%	---	---	
4,4'-DDE	44.0	---	2.00	"	"	"	---	88	70-125%	---	---	
4,4'-DDT	51.1	---	2.00	"	"	"	---	102	45-140%	---	---	
Dieldrin	44.4	---	2.00	"	"	"	---	89	65-125%	---	---	
Endosulfan I	41.0	---	2.00	"	"	"	---	82	15-135%	---	---	
Endosulfan II	44.0	---	2.00	"	"	"	---	88	35-140%	---	---	
Endosulfan sulfate	44.9	---	2.00	"	"	"	---	90	60-135%	---	---	
Endrin	46.9	---	2.00	"	"	"	---	94	"	---	---	
Endrin Aldehyde	39.4	---	2.00	"	"	"	---	79	30-145%	---	---	
Endrin ketone	44.0	---	2.00	"	"	"	---	88	65-135%	---	---	
Heptachlor	42.2	---	2.00	"	"	"	---	84	50-140%	---	---	
Heptachlor epoxide	39.8	---	2.00	"	"	"	---	80	65-130%	---	---	
Methoxychlor	53.0	---	6.00	"	"	"	---	106	55-145%	---	---	

Surr: 2,4,5,6-TCMX (Surr)

Recovery: 82 %

Limits: 50-125 %

Dilution: 1x

Decachlorobiphenyl (Surr)

97 %

55-130 %

"

## Matrix Spike (3100067-MS1)

Prepared: 10/02/13 08:20 Analyzed: 10/03/13 12:32

C-05

## QC Source Sample: REX-15 (0-6) (A3J0025-01RE1)

## EPA 8081B

Aldrin	40.7	---	20.5	ug/kg dry	10	51.3	ND	79	45-140%	---	---	
alpha-BHC	47.4	---	20.5	"	"	"	ND	92	60-125%	---	---	
beta-BHC	49.1	---	20.5	"	"	"	ND	96	"	---	---	
delta-BHC	42.8	---	20.5	"	"	"	ND	83	55-130%	---	---	
gamma-BHC (Lindane)	43.3	---	20.5	"	"	"	ND	84	60-125%	---	---	
cis-Chlordane	42.4	---	20.5	"	"	"	ND	83	60-120%	---	---	
trans-Chlordane	43.6	---	20.5	"	"	"	ND	85	65-125%	---	---	
4,4'-DDD	215	---	20.5	"	"	"	209	11	30-135%	---	---	Q-01
4,4'-DDE	64.5	---	20.5	"	"	"	ND	126	70-125%	---	---	
4,4'-DDT	378	---	20.5	"	"	"	347	60	45-140%	---	---	

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3100067 - EPA 3546/3640A (GPC)						Soil						
Matrix Spike (3100067-MS1)						Prepared: 10/02/13 08:20		Analyzed: 10/03/13 12:32			C-05	
QC Source Sample: REX-15 (0-6) (A3J0025-01RE1)												
Dieldrin	57.6	---	20.5	"	"	"	ND	112	65-125%	---	---	
Endosulfan I	43.2	---	20.5	"	"	"	ND	84	15-135%	---	---	
Endosulfan II	46.6	---	20.5	"	"	"	ND	91	35-140%	---	---	
Endosulfan sulfate	42.6	---	20.5	"	"	"	ND	83	60-135%	---	---	
Endrin	55.4	---	20.5	"	"	"	ND	108	"	---	---	
Endrin Aldehyde	39.9	---	20.5	"	"	"	ND	78	35-145%	---	---	
Endrin ketone	46.3	---	20.5	"	"	"	ND	90	65-135%	---	---	
Heptachlor	45.2	---	20.5	"	"	"	ND	88	50-140%	---	---	
Heptachlor epoxide	51.1	---	20.5	"	"	"	28.5	44	65-130%	---	---	Q-01
Methoxychlor	ND	---	61.5	"	"	"	ND	117	55-145%	---	---	
Surr: 2,4,5,6-TCMX (Surr)		Recovery: 80 %		Limits: 50-125 %		Dilution: 10x						
Decachlorobiphenyl (Surr)		110 %		55-130 %		"						

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: Pier 99  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3110131 - EPA 3546/3640A (GPC)						Soil						
Blank (3110131-BLK1)				Prepared: 11/04/13 07:28    Analyzed: 11/06/13 10:51					C-05			
EPA 8081B												
Aldrin	ND	---	1.67	ug/kg wet	1	---	---	---	---	---	---	
alpha-BHC	ND	---	1.67	"	"	---	---	---	---	---	---	
beta-BHC	ND	---	1.67	"	"	---	---	---	---	---	---	
delta-BHC	ND	---	1.67	"	"	---	---	---	---	---	---	
gamma-BHC (Lindane)	ND	---	1.67	"	"	---	---	---	---	---	---	
cis-Chlordane	ND	---	1.67	"	"	---	---	---	---	---	---	
trans-Chlordane	ND	---	1.67	"	"	---	---	---	---	---	---	
4,4'-DDD	ND	---	1.67	"	"	---	---	---	---	---	---	
4,4'-DDE	ND	---	1.67	"	"	---	---	---	---	---	---	
4,4'-DDT	ND	---	1.67	"	"	---	---	---	---	---	---	
Dieldrin	ND	---	1.67	"	"	---	---	---	---	---	---	
Endosulfan I	ND	---	1.67	"	"	---	---	---	---	---	---	
Endosulfan II	ND	---	1.67	"	"	---	---	---	---	---	---	
Endosulfan sulfate	ND	---	1.67	"	"	---	---	---	---	---	---	
Endrin	ND	---	1.67	"	"	---	---	---	---	---	---	
Endrin Aldehyde	ND	---	1.67	"	"	---	---	---	---	---	---	
Endrin ketone	ND	---	1.67	"	"	---	---	---	---	---	---	
Heptachlor	ND	---	1.67	"	"	---	---	---	---	---	---	
Heptachlor epoxide	ND	---	1.67	"	"	---	---	---	---	---	---	
Methoxychlor	ND	---	5.00	"	"	---	---	---	---	---	---	
Chlordane (Technical)	ND	---	50.0	"	"	---	---	---	---	---	---	
Toxaphene (Total)	ND	---	50.0	"	"	---	---	---	---	---	---	
Surr: 2,4,5,6-TCMX (Surr)		Recovery: 72 %		Limits: 50-125 %		Dilution: 1x						
Decachlorobiphenyl (Surr)		99 %		55-130 %		"						

## LCS (3110131-BS1)

Prepared: 11/04/13 07:28 Analyzed: 11/06/13 11:08

C-05

<b>EPA 8081B</b>												
Aldrin	40.3	---	2.00	ug/kg wet	1	50.0	---	81	45-140%	---	---	
alpha-BHC	41.9	---	2.00	"	"	"	---	84	60-125%	---	---	
beta-BHC	38.1	---	2.00	"	"	"	---	76	"	---	---	
delta-BHC	42.4	---	2.00	"	"	"	---	85	55-130%	---	---	

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
11/14/13 17:44

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3110131 - EPA 3546/3640A (GPC)</b>						<b>Soil</b>						
<b>LCS (3110131-BS1)</b>						Prepared: 11/04/13 07:28 Analyzed: 11/06/13 11:08						<b>C-05</b>
gamma-BHC (Lindane)	41.1	---	2.00	"	"	"	---	82	60-125%	---	---	
cis-Chlordane	40.6	---	2.00	"	"	"	---	81	60-120%	---	---	
trans-Chlordane	41.7	---	2.00	"	"	"	---	83	65-125%	---	---	
4,4'-DDD	46.7	---	2.00	"	"	"	---	93	30-135%	---	---	
4,4'-DDE	44.5	---	2.00	"	"	"	---	89	70-125%	---	---	
4,4'-DDT	52.8	---	2.00	"	"	"	---	106	45-140%	---	---	
Dieldrin	43.8	---	2.00	"	"	"	---	88	65-125%	---	---	
Endosulfan I	42.0	---	2.00	"	"	"	---	84	15-135%	---	---	
Endosulfan II	44.9	---	2.00	"	"	"	---	90	35-140%	---	---	
Endosulfan sulfate	47.4	---	2.00	"	"	"	---	95	60-135%	---	---	
Endrin	50.1	---	2.00	"	"	"	---	100	"	---	---	
Endrin Aldehyde	42.9	---	2.00	"	"	"	---	86	30-145%	---	---	
Endrin ketone	45.6	---	2.00	"	"	"	---	91	65-135%	---	---	
Heptachlor	44.6	---	2.00	"	"	"	---	89	50-140%	---	---	
Heptachlor epoxide	40.6	---	2.00	"	"	"	---	81	65-130%	---	---	
Methoxychlor	56.7	---	6.00	"	"	"	---	113	55-145%	---	---	
Surr: 2,4,5,6-TCMX (Surr)			Recovery: 84 %		Limits: 50-125 %		Dilution: 1x					
Decachlorobiphenyl (Surr)			101 %		55-130 %		"					

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
11/14/13 17:44

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3100050 - EPA 3546						Soil						
Blank (3100050-BLK1)						Prepared: 10/02/13 08:19    Analyzed: 10/02/13 12:44						
EPA 8270D P/P/P												
Acenaphthene	ND	---	3.64	ug/kg wet	1	---	---	---	---	---	---	
Acenaphthylene	ND	---	3.64	"	"	---	---	---	---	---	---	
Anthracene	ND	---	3.64	"	"	---	---	---	---	---	---	
Benz(a)anthracene	ND	---	3.64	"	"	---	---	---	---	---	---	
Benzo(a)pyrene	ND	---	5.45	"	"	---	---	---	---	---	---	
Benzo(b)fluoranthene	ND	---	5.45	"	"	---	---	---	---	---	---	
Benzo(k)fluoranthene	ND	---	5.45	"	"	---	---	---	---	---	---	
Benzo(b+k)fluoranthene(s)	ND	---	10.9	"	"	---	---	---	---	---	---	
Benzo(g,h,i)perylene	ND	---	3.64	"	"	---	---	---	---	---	---	
Chrysene	ND	---	3.64	"	"	---	---	---	---	---	---	
Dibenz(a,h)anthracene	ND	---	3.64	"	"	---	---	---	---	---	---	
Fluoranthene	ND	---	3.64	"	"	---	---	---	---	---	---	
Fluorene	ND	---	3.64	"	"	---	---	---	---	---	---	
Indeno(1,2,3-cd)pyrene	ND	---	3.64	"	"	---	---	---	---	---	---	
1-Methylnaphthalene	ND	---	7.27	"	"	---	---	---	---	---	---	
2-Methylnaphthalene	ND	---	7.27	"	"	---	---	---	---	---	---	
Naphthalene	ND	---	7.27	"	"	---	---	---	---	---	---	
Phenanthrene	ND	---	3.64	"	"	---	---	---	---	---	---	
Pyrene	ND	---	3.64	"	"	---	---	---	---	---	---	
Carbazole	ND	---	5.45	"	"	---	---	---	---	---	---	
Dibenzofuran	ND	---	3.64	"	"	---	---	---	---	---	---	
4-Chloro-3-methylphenol	ND	---	36.4	"	"	---	---	---	---	---	---	
2-Chlorophenol	ND	---	18.2	"	"	---	---	---	---	---	---	
2,4-Dichlorophenol	ND	---	18.2	"	"	---	---	---	---	---	---	
2,4-Dimethylphenol	ND	---	18.2	"	"	---	---	---	---	---	---	
2,4-Dinitrophenol	ND	---	72.7	"	"	---	---	---	---	---	---	
4,6-Dinitro-2-methylphenol	ND	---	218	"	"	---	---	---	---	---	---	
2-Methylphenol	ND	---	9.09	"	"	---	---	---	---	---	---	
3+4-Methylphenol(s)	ND	---	9.09	"	"	---	---	---	---	---	---	
2-Nitrophenol	ND	---	36.4	"	"	---	---	---	---	---	---	

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Portland, OR 97201Project: Pier 99  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3100050 - EPA 3546						Soil						
Blank (3100050-BLK1)			Prepared: 10/02/13 08:19 Analyzed: 10/02/13 12:44									
4-Nitrophenol	ND	---	36.4	ug/kg wet	"	---	---	---	---	---	---	B-02
Pentachlorophenol (PCP)	ND	---	36.4	"	"	---	---	---	---	---	---	
Phenol	ND	---	9.09	"	"	---	---	---	---	---	---	
2,3,4,6-Tetrachlorophenol	ND	---	18.2	"	"	---	---	---	---	---	---	
2,4,5-Trichlorophenol	ND	---	18.2	"	"	---	---	---	---	---	---	
2,4,6-Trichlorophenol	ND	---	18.2	"	"	---	---	---	---	---	---	
Bis(2-ethylhexyl)phthalate	ND	---	36.4	"	"	---	---	---	---	---	---	
Butyl benzyl phthalate	ND	---	36.4	"	"	---	---	---	---	---	---	
Diethylphthalate	ND	---	36.4	"	"	---	---	---	---	---	---	
Dimethylphthalate	ND	---	36.4	"	"	---	---	---	---	---	---	
Di-n-butylphthalate	ND	---	36.4	"	"	---	---	---	---	---	---	
Di-n-octyl phthalate	ND	---	72.7	"	"	---	---	---	---	---	---	
Surr: Nitrobenzene-d5 (Surr)		Recovery: 74 %		Limits: 35-120 %		Dilution: 1x						
2-Fluorobiphenyl (Surr)		76 %		45-120 %		"						
Phenol-d6 (Surr)		87 %		40-120 %		"						
p-Terphenyl-d14 (Surr)		97 %		30-125 %		"						
2-Fluorophenol (Surr)		85 %		35-120 %		"						
2,4,6-Tribromophenol (Surr)		68 %		35-125 %		"						
LCS (3100050-BS1)						Prepared: 10/02/13 08:19 Analyzed: 10/02/13 13:19						
EPA 8270D P/P/P												
Acenaphthene	690	---	4.00	ug/kg wet	1	800	---	86	45-120%	---	---	
Acenaphthylene	721	---	4.00	"	"	"	---	90	"	---	---	
Anthracene	741	---	4.00	"	"	"	---	93	55-120%	---	---	
Benz(a)anthracene	767	---	4.00	"	"	"	---	96	50-120%	---	---	
Benzo(a)pyrene	763	---	6.00	"	"	"	---	95	"	---	---	
Benzo(b)fluoranthene	771	---	6.00	"	"	"	---	96	45-120%	---	---	
Benzo(k)fluoranthene	740	---	6.00	"	"	"	---	92	45-125%	---	---	
Benzo(b+k)fluoranthene(s)	1520	---	12.0	"	"	1600	---	95	"	---	---	
Benzo(g,h,i)perylene	700	---	4.00	"	"	800	---	88	40-125%	---	---	
Chrysene	727	---	4.00	"	"	"	---	91	55-120%	---	---	
Dibenz(a,h)anthracene	770	---	4.00	"	"	"	---	96	40-125%	---	---	

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Page 20 of 39

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Portland, OR 97201Project: Pier 99  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3100050 - EPA 3546</b>						<b>Soil</b>						
<b>LCS (3100050-BS1)</b>						Prepared: 10/02/13 08:19 Analyzed: 10/02/13 13:19						
Fluoranthene	759	---	4.00	ug/kg wet	"	"	---	95	55-120%	---	---	
Fluorene	725	---	4.00	"	"	"	---	91	50-120%	---	---	
Indeno(1,2,3-cd)pyrene	744	---	4.00	"	"	"	---	93	40-120%	---	---	
1-Methylnaphthalene	716	---	8.00	"	"	"	---	89	45-120%	---	---	
2-Methylnaphthalene	748	---	8.00	"	"	"	---	94	"	---	---	
Naphthalene	657	---	8.00	"	"	"	---	82	40-120%	---	---	
Phenanthrene	682	---	4.00	"	"	"	---	85	50-120%	---	---	
Pyrene	738	---	4.00	"	"	"	---	92	45-120%	---	---	
Carbazole	764	---	6.00	"	"	"	---	95	"	---	---	
Dibenzofuran	703	---	4.00	"	"	"	---	88	50-120%	---	---	
4-Chloro-3-methylphenol	748	---	40.0	"	"	"	---	94	45-120%	---	---	
2-Chlorophenol	721	---	20.0	"	"	"	---	90	"	---	---	
2,4-Dichlorophenol	705	---	20.0	"	"	"	---	88	"	---	---	
2,4-Dimethylphenol	775	---	20.0	"	"	"	---	97	30-120%	---	---	
2,4-Dinitrophenol	624	---	80.0	"	"	"	---	78	15-130%	---	---	Q-31
4,6-Dinitro-2-methylphenol	657	---	240	"	"	"	---	82	30-135%	---	---	
2-Methylphenol	683	---	10.0	"	"	"	---	85	40-120%	---	---	
3+4-Methylphenol(s)	755	---	10.0	"	"	"	---	94	"	---	---	
2-Nitrophenol	712	---	40.0	"	"	"	---	89	"	---	---	Q-41
4-Nitrophenol	650	---	40.0	"	"	"	---	81	15-140%	---	---	
Pentachlorophenol (PCP)	617	---	40.0	"	"	"	---	77	25-120%	---	---	
Phenol	781	---	10.0	"	"	"	---	98	40-120%	---	---	B-02
2,3,4,6-Tetrachlorophenol	668	---	20.0	"	"	"	---	84	"	---	---	
2,4,5-Trichlorophenol	687	---	20.0	"	"	"	---	86	50-120%	---	---	
2,4,6-Trichlorophenol	676	---	20.0	"	"	"	---	85	45-120%	---	---	
Bis(2-ethylhexyl)phthalate	773	---	40.0	"	"	"	---	97	45-125%	---	---	
Butyl benzyl phthalate	795	---	40.0	"	"	"	---	99	50-125%	---	---	
Diethylphthalate	785	---	40.0	"	"	"	---	98	50-120%	---	---	
Dimethylphthalate	729	---	40.0	"	"	"	---	91	"	---	---	
Di-n-butylphthalate	741	---	40.0	"	"	"	---	93	55-120%	---	---	
Di-n-octyl phthalate	829	---	80.0	"	"	"	---	104	40-130%	---	---	

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Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3100050 - EPA 3546							Soil					
LCS (3100050-BS1)				Prepared: 10/02/13 08:19    Analyzed: 10/02/13 13:19								
Surr: Nitrobenzene-d5 (Surr)		Recovery: 85 %		Limits: 35-120 %		Dilution: 1x						
2-Fluorobiphenyl (Surr)		83 %		45-120 %		"						
Phenol-d6 (Surr)		100 %		40-120 %		"						
p-Terphenyl-d14 (Surr)		94 %		30-125 %		"						
2-Fluorophenol (Surr)		94 %		35-120 %		"						
2,4,6-Tribromophenol (Surr)		83 %		35-125 %		"						
Duplicate (3100050-DUP1)				Prepared: 10/02/13 08:19    Analyzed: 10/02/13 15:14								
QC Source Sample: REX-15 (0-6) (A3J0025-01RE1)												
EPA 8270D P/P/P												
Acenaphthene	ND	---	40.6	ug/kg dry	10	---	ND	---	---	---	30%	
Acenaphthylene	ND	---	40.6	"	"	---	ND	---	---	---	30%	
Anthracene	ND	---	40.6	"	"	---	ND	---	---	---	30%	
Benz(a)anthracene	50.7	---	40.6	"	"	---	85.1	---	---	51	30%	Q-05
Benzo(a)pyrene	78.6	---	61.0	"	"	---	133	---	---	51	30%	Q-05
Benzo(b)fluoranthene	133	---	61.0	"	"	---	207	---	---	44	30%	Q-05
Benzo(k)fluoranthene	ND	---	61.0	"	"	---	76.2	---	---	***	30%	
Benzo(b+k)fluoranthene(s)	187	---	122	"	"	---	293	---	---	44	30%	Q-05
Benzo(g,h,i)perylene	69.6	---	40.6	"	"	---	104	---	---	40	30%	Q-05
Chrysene	69.5	---	40.6	"	"	---	124	---	---	57	30%	Q-05
Dibenz(a,h)anthracene	ND	---	40.6	"	"	---	24.4	---	---	***	30%	
Fluoranthene	57.6	---	40.6	"	"	---	133	---	---	79	30%	Q-05
Fluorene	ND	---	40.6	"	"	---	ND	---	---	---	30%	
Indeno(1,2,3-cd)pyrene	54.2	---	40.6	"	"	---	94.3	---	---	54	30%	Q-05
1-Methylnaphthalene	ND	---	81.3	"	"	---	ND	---	---	---	30%	
2-Methylnaphthalene	ND	---	81.3	"	"	---	ND	---	---	---	30%	
Naphthalene	ND	---	81.3	"	"	---	ND	---	---	---	30%	
Phenanthrene	ND	---	40.6	"	"	---	105	---	---	***	30%	Q-05
Pyrene	50.9	---	40.6	"	"	---	123	---	---	83	30%	Q-05
Carbazole	ND	---	61.0	"	"	---	ND	---	---	---	30%	
Dibenzofuran	ND	---	40.6	"	"	---	ND	---	---	---	30%	
4-Chloro-3-methylphenol	ND	---	406	"	"	---	ND	---	---	---	30%	

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Page 22 of 39

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3100050 - EPA 3546						Soil						
Duplicate (3100050-DUP1)						Prepared: 10/02/13 08:19		Analyzed: 10/02/13 15:14				
QC Source Sample: REX-15 (0-6) (A3J0025-01RE1)												
2-Chlorophenol	ND	---	203	ug/kg dry	"	---	ND	---	---	---	30%	
2,4-Dichlorophenol	ND	---	203	"	"	---	ND	---	---	---	30%	
2,4-Dimethylphenol	ND	---	203	"	"	---	ND	---	---	---	30%	
2,4-Dinitrophenol	ND	---	813	"	"	---	ND	---	---	---	30%	
4,6-Dinitro-2-methylphenol	ND	---	2440	"	"	---	ND	---	---	---	30%	
2-Methylphenol	ND	---	102	"	"	---	ND	---	---	---	30%	
3+4-Methylphenol(s)	ND	---	102	"	"	---	ND	---	---	---	30%	
2-Nitrophenol	ND	---	406	"	"	---	ND	---	---	---	30%	
4-Nitrophenol	ND	---	406	"	"	---	ND	---	---	---	30%	
Pentachlorophenol (PCP)	ND	---	406	"	"	---	ND	---	---	---	30%	
Phenol	ND	---	102	"	"	---	869	---	---	***	30%	Q-05
2,3,4,6-Tetrachlorophenol	ND	---	203	"	"	---	ND	---	---	---	30%	
2,4,5-Trichlorophenol	ND	---	203	"	"	---	ND	---	---	---	30%	
2,4,6-Trichlorophenol	ND	---	203	"	"	---	ND	---	---	---	30%	
Bis(2-ethylhexyl)phthalate	737	---	406	"	"	---	862	---	---	16	30%	
Butyl benzyl phthalate	ND	---	406	"	"	---	ND	---	---	---	30%	
Diethylphthalate	ND	---	406	"	"	---	ND	---	---	---	30%	
Dimethylphthalate	686	---	406	"	"	---	2840	---	---	122	30%	Q-05
Di-n-butylphthalate	ND	---	406	"	"	---	482	---	---	***	30%	Q-05
Di-n-octyl phthalate	ND	---	813	"	"	---	ND	---	---	---	30%	

<i>Surr: Nitrobenzene-d5 (Surr)</i>	<i>Recovery: 43 %</i>	<i>Limits: 35-120 %</i>	<i>Dilution: 10x</i>
<i>2-Fluorobiphenyl (Surr)</i>	<i>52 %</i>	<i>45-120 %</i>	<i>"</i>
<i>Phenol-d6 (Surr)</i>	<i>57 %</i>	<i>40-120 %</i>	<i>"</i>
<i>p-Terphenyl-d14 (Surr)</i>	<i>84 %</i>	<i>30-125 %</i>	<i>"</i>
<i>2-Fluorophenol (Surr)</i>	<i>49 %</i>	<i>35-120 %</i>	<i>"</i>
<i>2,4,6-Tribromophenol (Surr)</i>	<i>64 %</i>	<i>35-125 %</i>	<i>"</i>

## Matrix Spike (3100050-MS1)

Prepared: 10/02/13 08:19 Analyzed: 10/02/13 15:50

## QC Source Sample: REX-15 (0-6) (A3J0025-01RE1)

## EPA 8270D P/P/P

Acenaphthene	637	---	42.9	ug/kg dry	10	858	ND	74	45-120%	---	---
--------------	-----	-----	------	-----------	----	-----	----	----	---------	-----	-----

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: Pier 99  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3100050 - EPA 3546							Soil					
Matrix Spike (3100050-MS1)				Prepared: 10/02/13 08:19    Analyzed: 10/02/13 15:50								
QC Source Sample: REX-15 (0-6) (A3J0025-01RE1)												
Acenaphthylene	646	---	42.9	ug/kg dry	"	"	ND	75	"	---	---	
Anthracene	770	---	42.9	"	"	"	ND	90	55-120%	---	---	
Benz(a)anthracene	827	---	42.9	"	"	"	85.1	87	50-120%	---	---	
Benzo(a)pyrene	931	---	64.3	"	"	"	133	93	"	---	---	
Benzo(b)fluoranthene	1010	---	64.3	"	"	"	207	94	45-120%	---	---	
Benzo(k)fluoranthene	845	---	64.3	"	"	"	76.2	90	45-125%	---	---	
Benzo(b+k)fluoranthene(s)	1850	---	129	"	"	1720	293	91	"	---	---	
Benzo(g,h,i)perylene	859	---	42.9	"	"	858	104	88	40-125%	---	---	
Chrysene	865	---	42.9	"	"	"	124	86	55-120%	---	---	
Dibenz(a,h)anthracene	751	---	42.9	"	"	"	24.4	85	40-125%	---	---	
Fluoranthene	869	---	42.9	"	"	"	133	86	55-120%	---	---	
Fluorene	680	---	42.9	"	"	"	ND	79	50-120%	---	---	
Indeno(1,2,3-cd)pyrene	825	---	42.9	"	"	"	94.3	85	40-120%	---	---	
1-Methylnaphthalene	505	---	85.8	"	"	"	ND	59	45-120%	---	---	
2-Methylnaphthalene	556	---	85.8	"	"	"	ND	65	"	---	---	
Naphthalene	485	---	85.8	"	"	"	ND	57	40-120%	---	---	
Phenanthrene	772	---	42.9	"	"	"	105	78	50-120%	---	---	
Pyrene	808	---	42.9	"	"	"	123	80	45-120%	---	---	
Carbazole	840	---	64.3	"	"	"	ND	98	"	---	---	
Dibenzofuran	652	---	42.9	"	"	"	ND	76	50-120%	---	---	
4-Chloro-3-methylphenol	625	---	429	"	"	"	ND	73	45-120%	---	---	
2-Chlorophenol	476	---	214	"	"	"	ND	55	"	---	---	
2,4-Dichlorophenol	502	---	214	"	"	"	ND	59	"	---	---	
2,4-Dimethylphenol	435	---	214	"	"	"	ND	51	30-120%	---	---	
2,4-Dinitrophenol	ND	---	858	"	"	"	ND	69	15-130%	---	---	Q-31
4,6-Dinitro-2-methylphenol	ND	---	2570	"	"	"	ND	62	30-135%	---	---	
2-Methylphenol	540	---	107	"	"	"	ND	63	40-120%	---	---	
3+4-Methylphenol(s)	539	---	107	"	"	"	ND	63	"	---	---	
2-Nitrophenol	520	---	429	"	"	"	ND	61	"	---	---	Q-41
4-Nitrophenol	643	---	429	"	"	"	ND	75	15-140%	---	---	

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3100050 - EPA 3546						Soil						
Matrix Spike (3100050-MS1)				Prepared: 10/02/13 08:19    Analyzed: 10/02/13 15:50								
QC Source Sample: REX-15 (0-6) (A3J0025-01RE1)												
Pentachlorophenol (PCP)	696	---	429	ug/kg dry	"	"	ND	81	25-120%	---	---	B-02, Q-01
Phenol	811	---	107	"	"	"	869	-7	40-120%	---	---	
2,3,4,6-Tetrachlorophenol	595	---	214	"	"	"	ND	69	"	---	---	
2,4,5-Trichlorophenol	622	---	214	"	"	"	ND	72	50-120%	---	---	
2,4,6-Trichlorophenol	566	---	214	"	"	"	ND	66	45-120%	---	---	Q-01
Bis(2-ethylhexyl)phthalate	1960	---	429	"	"	"	862	128	45-125%	---	---	
Butyl benzyl phthalate	1040	---	429	"	"	"	ND	122	50-125%	---	---	
Diethylphthalate	761	---	429	"	"	"	ND	89	50-120%	---	---	
Dimethylphthalate	2040	---	429	"	"	"	2840	-94	"	---	---	Q-01
Di-n-butylphthalate	1080	---	429	"	"	"	482	69	55-120%	---	---	Q-01
Di-n-octyl phthalate	1140	---	858	"	"	"	ND	133	40-130%	---	---	
Surr: Nitrobenzene-d5 (Surr)		Recovery:		52 %	Limits:		35-120 %	Dilution: 10x				
2-Fluorobiphenyl (Surr)				62 %			45-120 %	"				
Phenol-d6 (Surr)				67 %			40-120 %	"				
p-Terphenyl-d14 (Surr)				89 %			30-125 %	"				
2-Fluorophenol (Surr)				54 %			35-120 %	"				
2,4,6-Tribromophenol (Surr)				76 %			35-125 %	"				

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: Pier 99  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3110193 - EPA 3546						Soil						
Blank (3110193-BLK1)				Prepared: 11/07/13 08:43    Analyzed: 11/07/13 20:10								
EPA 8270D P/P/P												
Acenaphthene	ND	---	3.33	ug/kg wet	1	---	---	---	---	---	---	
Acenaphthylene	ND	---	3.33	"	"	---	---	---	---	---	---	
Anthracene	ND	---	3.33	"	"	---	---	---	---	---	---	
Benz(a)anthracene	ND	---	3.33	"	"	---	---	---	---	---	---	
Benzo(a)pyrene	ND	---	5.00	"	"	---	---	---	---	---	---	
Benzo(b)fluoranthene	ND	---	5.00	"	"	---	---	---	---	---	---	
Benzo(k)fluoranthene	ND	---	5.00	"	"	---	---	---	---	---	---	
Benzo(b+k)fluoranthene(s)	ND	---	10.0	"	"	---	---	---	---	---	---	
Benzo(g,h,i)perylene	ND	---	3.33	"	"	---	---	---	---	---	---	
Chrysene	ND	---	3.33	"	"	---	---	---	---	---	---	
Dibenz(a,h)anthracene	ND	---	3.33	"	"	---	---	---	---	---	---	
Fluoranthene	ND	---	3.33	"	"	---	---	---	---	---	---	
Fluorene	ND	---	3.33	"	"	---	---	---	---	---	---	
Indeno(1,2,3-cd)pyrene	ND	---	3.33	"	"	---	---	---	---	---	---	
1-Methylnaphthalene	ND	---	6.67	"	"	---	---	---	---	---	---	
2-Methylnaphthalene	ND	---	6.67	"	"	---	---	---	---	---	---	
Naphthalene	ND	---	6.67	"	"	---	---	---	---	---	---	
Phenanthrene	ND	---	3.33	"	"	---	---	---	---	---	---	
Pyrene	ND	---	3.33	"	"	---	---	---	---	---	---	
Carbazole	ND	---	5.00	"	"	---	---	---	---	---	---	
Dibenzofuran	ND	---	3.33	"	"	---	---	---	---	---	---	
4-Chloro-3-methylphenol	ND	---	33.3	"	"	---	---	---	---	---	---	
2-Chlorophenol	ND	---	16.7	"	"	---	---	---	---	---	---	
2,4-Dichlorophenol	ND	---	16.7	"	"	---	---	---	---	---	---	
2,4-Dimethylphenol	ND	---	16.7	"	"	---	---	---	---	---	---	
2,4-Dinitrophenol	ND	---	68.3	"	"	---	---	---	---	---	---	
4,6-Dinitro-2-methylphenol	ND	---	200	"	"	---	---	---	---	---	---	
2-Methylphenol	ND	---	8.33	"	"	---	---	---	---	---	---	
3+4-Methylphenol(s)	ND	---	8.33	"	"	---	---	---	---	---	---	
2-Nitrophenol	ND	---	33.3	"	"	---	---	---	---	---	---	

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Darrell Auvil For Darwin Thomas, Business Development Director

Page 26 of 39

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: Pier 99  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3110193 - EPA 3546						Soil						
Blank (3110193-BLK1)			Prepared: 11/07/13 08:43 Analyzed: 11/07/13 20:10									
4-Nitrophenol	ND	---	33.3	ug/kg wet	"	---	---	---	---	---	---	
Pentachlorophenol (PCP)	ND	---	33.3	"	"	---	---	---	---	---	---	
Phenol	ND	---	11.7	"	"	---	---	---	---	---	---	
2,3,4,6-Tetrachlorophenol	ND	---	16.7	"	"	---	---	---	---	---	---	
2,4,5-Trichlorophenol	ND	---	16.7	"	"	---	---	---	---	---	---	
2,4,6-Trichlorophenol	ND	---	16.7	"	"	---	---	---	---	---	---	
Bis(2-ethylhexyl)phthalate	ND	---	33.3	"	"	---	---	---	---	---	---	
Butyl benzyl phthalate	ND	---	33.3	"	"	---	---	---	---	---	---	
Diethylphthalate	ND	---	33.3	"	"	---	---	---	---	---	---	
Dimethylphthalate	ND	---	33.3	"	"	---	---	---	---	---	---	
Di-n-butylphthalate	ND	---	33.3	"	"	---	---	---	---	---	---	
Di-n-octyl phthalate	ND	---	66.7	"	"	---	---	---	---	---	---	
Surr: Nitrobenzene-d5 (Surr)		Recovery: 89 %		Limits: 35-120 %		Dilution: 1x						
2-Fluorobiphenyl (Surr)		83 %		45-120 %		"						
Phenol-d6 (Surr)		94 %		40-120 %		"						
p-Terphenyl-d14 (Surr)		91 %		30-125 %		"						
2-Fluorophenol (Surr)		90 %		35-120 %		"						
2,4,6-Tribromophenol (Surr)		68 %		35-125 %		"						
LCS (3110193-BS1)						Prepared: 11/07/13 08:43 Analyzed: 11/07/13 20:46						
EPA 8270D P/P/P												
Acenaphthene	802	---	4.00	ug/kg wet	1	800	---	100	45-120%	---	---	
Acenaphthylene	804	---	4.00	"	"	"	---	101	"	---	---	
Anthracene	817	---	4.00	"	"	"	---	102	55-120%	---	---	
Benz(a)anthracene	872	---	4.00	"	"	"	---	109	50-120%	---	---	
Benzo(a)pyrene	888	---	6.00	"	"	"	---	111	"	---	---	
Benzo(b)fluoranthene	895	---	6.00	"	"	"	---	112	45-120%	---	---	
Benzo(k)fluoranthene	840	---	6.00	"	"	"	---	105	45-125%	---	---	
Benzo(b+k)fluoranthene(s)	1720	---	12.0	"	"	1600	---	108	"	---	---	
Benzo(g,h,i)perylene	773	---	4.00	"	"	800	---	97	40-125%	---	---	
Chrysene	832	---	4.00	"	"	"	---	104	55-120%	---	---	
Dibenz(a,h)anthracene	818	---	4.00	"	"	"	---	102	40-125%	---	---	

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
11/14/13 17:44

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3110193 - EPA 3546</b>						<b>Soil</b>						
<b>LCS (3110193-BS1)</b>						Prepared: 11/07/13 08:43 Analyzed: 11/07/13 20:46						
Fluoranthene	876	---	4.00	ug/kg wet	"	"	---	109	55-120%	---	---	
Fluorene	810	---	4.00	"	"	"	---	101	50-120%	---	---	
Indeno(1,2,3-cd)pyrene	814	---	4.00	"	"	"	---	102	40-120%	---	---	
1-Methylnaphthalene	817	---	8.00	"	"	"	---	102	45-120%	---	---	
2-Methylnaphthalene	842	---	8.00	"	"	"	---	105	"	---	---	
Naphthalene	769	---	8.00	"	"	"	---	96	40-120%	---	---	
Phenanthrene	784	---	4.00	"	"	"	---	98	50-120%	---	---	
Pyrene	879	---	4.00	"	"	"	---	110	45-120%	---	---	
Carbazole	825	---	6.00	"	"	"	---	103	"	---	---	
Dibenzofuran	768	---	4.00	"	"	"	---	96	50-120%	---	---	
4-Chloro-3-methylphenol	923	---	40.0	"	"	"	---	115	45-120%	---	---	
2-Chlorophenol	805	---	20.0	"	"	"	---	101	"	---	---	
2,4-Dichlorophenol	774	---	20.0	"	"	"	---	97	"	---	---	
2,4-Dimethylphenol	871	---	20.0	"	"	"	---	109	30-120%	---	---	
2,4-Dinitrophenol	705	---	82.0	"	"	"	---	88	15-130%	---	---	
4,6-Dinitro-2-methylphenol	737	---	240	"	"	"	---	92	30-135%	---	---	
2-Methylphenol	799	---	10.0	"	"	"	---	100	40-120%	---	---	
3+4-Methylphenol(s)	891	---	10.0	"	"	"	---	111	"	---	---	
2-Nitrophenol	767	---	40.0	"	"	"	---	96	"	---	---	
4-Nitrophenol	820	---	40.0	"	"	"	---	103	15-140%	---	---	
Pentachlorophenol (PCP)	652	---	40.0	"	"	"	---	82	25-120%	---	---	Q-31
Phenol	865	---	14.0	"	"	"	---	108	40-120%	---	---	Q-41
2,3,4,6-Tetrachlorophenol	757	---	20.0	"	"	"	---	95	"	---	---	
2,4,5-Trichlorophenol	770	---	20.0	"	"	"	---	96	50-120%	---	---	
2,4,6-Trichlorophenol	711	---	20.0	"	"	"	---	89	45-120%	---	---	
Bis(2-ethylhexyl)phthalate	886	---	40.0	"	"	"	---	111	45-125%	---	---	
Butyl benzyl phthalate	900	---	40.0	"	"	"	---	113	50-125%	---	---	
Diethylphthalate	923	---	40.0	"	"	"	---	115	50-120%	---	---	
Dimethylphthalate	828	---	40.0	"	"	"	---	103	"	---	---	
Di-n-butylphthalate	905	---	40.0	"	"	"	---	113	55-120%	---	---	
Di-n-octyl phthalate	994	---	80.0	"	"	"	---	124	40-130%	---	---	

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3110193 - EPA 3546</b>						<b>Soil</b>						
<b>LCS (3110193-BS1)</b>						Prepared: 11/07/13 08:43 Analyzed: 11/07/13 20:46						
Surr: Nitrobenzene-d5 (Surr)			Recovery: 103 %		Limits: 35-120 %		Dilution: 1x					
2-Fluorobiphenyl (Surr)			94 %		45-120 %		"					
Phenol-d6 (Surr)			107 %		40-120 %		"					Q-41
p-Terphenyl-d14 (Surr)			92 %		30-125 %		"					
2-Fluorophenol (Surr)			103 %		35-120 %		"					
2,4,6-Tribromophenol (Surr)			84 %		35-125 %		"					

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: Pier 99  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Polyaromatic Hydrocarbons (PAHs) by EPA 8270D SIM

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3100109 - EPA 3546						Soil						
Blank (3100109-BLK1)				Prepared: 10/03/13 10:27    Analyzed: 10/03/13 20:57								
EPA 8270D (SIM)												
Acenaphthene	ND	---	7.69	ug/kg wet	1	---	---	---	---	---	---	
Acenaphthylene	ND	---	7.69	"	"	---	---	---	---	---	---	
Anthracene	ND	---	7.69	"	"	---	---	---	---	---	---	
Benz(a)anthracene	ND	---	7.69	"	"	---	---	---	---	---	---	
Benzo(a)pyrene	ND	---	7.69	"	"	---	---	---	---	---	---	
Benzo(b)fluoranthene	ND	---	7.69	"	"	---	---	---	---	---	---	
Benzo(k)fluoranthene	ND	---	7.69	"	"	---	---	---	---	---	---	
Benzo(b+k)fluoranthene(s)	ND	---	15.4	"	"	---	---	---	---	---	---	
Benzo(g,h,i)perylene	ND	---	7.69	"	"	---	---	---	---	---	---	
Chrysene	ND	---	7.69	"	"	---	---	---	---	---	---	
Dibenz(a,h)anthracene	ND	---	7.69	"	"	---	---	---	---	---	---	
Dibenzofuran	ND	---	7.69	"	"	---	---	---	---	---	---	
Fluoranthene	ND	---	7.69	"	"	---	---	---	---	---	---	
Fluorene	ND	---	7.69	"	"	---	---	---	---	---	---	
Indeno(1,2,3-cd)pyrene	ND	---	7.69	"	"	---	---	---	---	---	---	
1-Methylnaphthalene	ND	---	7.69	"	"	---	---	---	---	---	---	
2-Methylnaphthalene	ND	---	7.69	"	"	---	---	---	---	---	---	
Naphthalene	ND	---	7.69	"	"	---	---	---	---	---	---	
Phenanthrene	ND	---	7.69	"	"	---	---	---	---	---	---	
Pyrene	ND	---	7.69	"	"	---	---	---	---	---	---	

Surr: 2-Fluorobiphenyl (Surr)  
p-Terphenyl-d14 (Surr)Recovery: 82 % Limits: 45-120 %  
98 % 30-120 %Dilution: 1x  
"

## LCS (3100109-BS1)

Prepared: 10/03/13 10:27 Analyzed: 10/03/13 21:24

<b>EPA 8270D (SIM)</b>												
Acenaphthene	718	---	10.0	ug/kg wet	1	800	---	90	45-125%	---	---	
Acenaphthylene	717	---	10.0	"	"	"	---	90	"	---	---	
Anthracene	737	---	10.0	"	"	"	---	92	55-125%	---	---	
Benz(a)anthracene	731	---	10.0	"	"	"	---	91	50-125%	---	---	
Benzo(a)pyrene	747	---	10.0	"	"	"	---	93	"	---	---	
Benzo(b)fluoranthene	554	---	10.0	"	"	"	---	69	45-125%	---	---	

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Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
11/14/13 17:44

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Polyaromatic Hydrocarbons (PAHs) by EPA 8270D SIM

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3100109 - EPA 3546</b>						<b>Soil</b>						
<b>LCS (3100109-BS1)</b>						Prepared: 10/03/13 10:27 Analyzed: 10/03/13 21:24						
Benzo(k)fluoranthene	535	---	10.0	"	"	"	---	67	"	---	---	
Benzo(b+k)fluoranthene(s)	1080	---	20.0	"	"	1600	---	68	"	---	---	
Benzo(g,h,i)perylene	781	---	10.0	"	"	800	---	98	40-125%	---	---	
Chrysene	763	---	10.0	"	"	"	---	95	55-125%	---	---	
Dibenz(a,h)anthracene	782	---	10.0	"	"	"	---	98	40-125%	---	---	
Dibenzofuran	722	---	10.0	"	"	"	---	90	50-125%	---	---	
Fluoranthene	737	---	10.0	"	"	"	---	92	55-125%	---	---	
Fluorene	750	---	10.0	"	"	"	---	94	50-125%	---	---	
Indeno(1,2,3-cd)pyrene	766	---	10.0	"	"	"	---	96	40-125%	---	---	
1-Methylnaphthalene	727	---	10.0	"	"	"	---	91	45-125%	---	---	
2-Methylnaphthalene	738	---	10.0	"	"	"	---	92	"	---	---	
Naphthalene	705	---	10.0	"	"	"	---	88	40-125%	---	---	
Phenanthrene	716	---	10.0	"	"	"	---	89	50-125%	---	---	
Pyrene	717	---	10.0	"	"	"	---	90	45-125%	---	---	
Surr: 2-Fluorobiphenyl (Surr)		Recovery: 86 %		Limits: 45-120 %		Dilution: 1x						
p-Terphenyl-d14 (Surr)		100 %		30-120 %		"						

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Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3100055 - EPA 3051A						Soil						
Blank (3100055-BLK1)						Prepared: 10/02/13 09:30		Analyzed: 10/02/13 13:09				
EPA 6020A												
Antimony	ND	0.500	1.00	mg/kg wet	10	---	---	---	---	---	---	
Cadmium	ND	0.100	0.200	"	"	---	---	---	---	---	---	
Chromium	ND	0.500	1.00	"	"	---	---	---	---	---	---	
Copper	ND	0.500	1.00	"	"	---	---	---	---	---	---	
Lead	ND	0.100	0.200	"	"	---	---	---	---	---	---	
Nickel	ND	0.500	1.00	"	"	---	---	---	---	---	---	
Zinc	ND	2.00	4.00	"	"	---	---	---	---	---	---	
LCS (3100055-BS1)						Prepared: 10/02/13 09:30		Analyzed: 10/02/13 13:12				
EPA 6020A												
Antimony	24.7	0.500	1.00	mg/kg wet	10	25.0	---	99	80-120%	---	---	
Cadmium	48.7	0.100	0.200	"	"	50.0	---	97	"	---	---	
Chromium	51.6	0.500	1.00	"	"	"	---	103	"	---	---	
Copper	52.9	0.500	1.00	"	"	"	---	106	"	---	---	
Lead	52.0	0.100	0.200	"	"	"	---	104	"	---	---	
Nickel	52.6	0.500	1.00	"	"	"	---	105	"	---	---	
Zinc	49.9	2.00	4.00	"	"	"	---	100	"	---	---	

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Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3110116 - EPA 3051A						Soil						
Blank (3110116-BLK1)						Prepared: 11/05/13 13:30		Analyzed: 11/05/13 16:29				
EPA 6020A												
Arsenic	ND	---	1.00	mg/kg wet	10	---	---	---	---	---	---	
Barium	ND	---	1.00	"	"	---	---	---	---	---	---	
Cadmium	ND	0.100	0.900	"	"	---	---	---	---	---	---	
Chromium	ND	0.500	1.00	"	"	---	---	---	---	---	---	
Lead	ND	0.100	0.900	"	"	---	---	---	---	---	---	
Mercury	ND	---	0.0800	"	"	---	---	---	---	---	---	
Selenium	ND	---	1.00	"	"	---	---	---	---	---	---	
Silver	ND	---	0.900	"	"	---	---	---	---	---	---	
LCS (3110116-BS1)						Prepared: 11/05/13 13:30		Analyzed: 11/05/13 16:32				
EPA 6020A												
Arsenic	51.4	---	1.00	mg/kg wet	10	50.0	---	103	80-120%	---	---	
Barium	50.6	---	1.00	"	"	"	---	101	"	---	---	
Cadmium	51.0	0.100	0.900	"	"	"	---	102	"	---	---	
Chromium	50.6	0.500	1.00	"	"	"	---	101	"	---	---	
Lead	50.2	0.100	0.900	"	"	"	---	100	"	---	---	
Mercury	1.04	---	0.0800	"	"	1.00	---	104	"	---	---	
Selenium	26.6	---	1.00	"	"	25.0	---	106	"	---	---	
Silver	25.5	---	0.900	"	"	"	---	102	"	---	---	

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Page 33 of 39

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Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3100032 - Total Solids (Dry Weight)							Soil					
Duplicate (3100032-DUP4)					Prepared: 10/01/13 17:42		Analyzed: 10/02/13 10:01					
QC Source Sample: RAC-1 (0-6) (A3J0025-02)												
EPA 8000C												
% Solids	81.0	---	1.00	% by Weight	1	---	81.5	---	---	0.6	20%	

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

**Batch 3100893 - Total Solids (Dry Weight)****Soil**

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

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Page 34 of 39

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Portland, OR 97201Project: Pier 99  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
11/14/13 17:44

## SAMPLE PREPARATION INFORMATION

## Polychlorinated Biphenyls by EPA 8082A

## Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3100052							
A3J0025-01RE1	Soil	EPA 8082A	10/01/13 09:45	10/02/13 08:21	10.36g/5mL	10g/5mL	0.97
A3J0025-02	Soil	EPA 8082A	10/01/13 10:05	10/02/13 08:21	10.06g/5mL	10g/5mL	0.99

## Organochlorine Pesticides by EPA 8081B

## Prep: EPA 3546/3640A (GPC)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3100067							
A3J0025-01RE1	Soil	EPA 8081B	10/01/13 09:45	10/02/13 08:20	10.56g/10mL	10g/5mL	1.89
Batch: 3110131							
A3J0025-03RE1	Soil	EPA 8081B	10/01/13 10:20	11/04/13 07:28	11.56g/10mL	10g/5mL	1.73

## Semivolatile Organic Compounds by EPA 8270D - Selected Analytes

## Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3100050							
A3J0025-01	Soil	EPA 8270D P/P/P	10/01/13 09:45	10/02/13 08:19	10.62g/2mL	10g/2mL	0.94
A3J0025-01RE1	Soil	EPA 8270D P/P/P	10/01/13 09:45	10/02/13 08:19	10.62g/2mL	10g/2mL	0.94
Batch: 3110193							
A3J0025-03RE1	Soil	EPA 8270D P/P/P	10/01/13 10:20	11/07/13 08:43	11.26g/5mL	10g/2mL	2.22

## Polyaromatic Hydrocarbons (PAHs) by EPA 8270D SIM

## Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3100109							
A3J0025-02RE1	Soil	EPA 8270D (SIM)	10/01/13 10:05	10/03/13 10:27	11.56g/5mL	10g/5mL	0.87

## Total Metals by EPA 6020 (ICPMS)

## Prep: EPA 3051A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3100055							
A3J0025-01	Soil	EPA 6020A	10/01/13 09:45	10/02/13 09:30	0.475g/50mL	0.5g/50mL	1.05
A3J0025-02	Soil	EPA 6020A	10/01/13 10:05	10/02/13 09:30	0.504g/50mL	0.5g/50mL	0.99

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Page 35 of 39

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell**Reported:**  
11/14/13 17:44

## SAMPLE PREPARATION INFORMATION

## Total Metals by EPA 6020 (ICPMS)

**Prep: EPA 3051A**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<b>Batch: 3110116</b>							
A3J0025-03	Soil	EPA 6020A	10/01/13 10:20	11/05/13 13:30	0.45g/50mL	0.5g/50mL	1.11

## Percent Dry Weight

**Prep: Total Solids (Dry Weight)**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<b>Batch: 3100032</b>							
A3J0025-01	Soil	EPA 8000C	10/01/13 09:45	10/01/13 17:23	1N/A/1N/A	1N/A/1N/A	NA
A3J0025-02	Soil	EPA 8000C	10/01/13 10:05	10/01/13 17:42	1N/A/1N/A	1N/A/1N/A	NA
<b>Batch: 3100893</b>							
A3J0025-03	Soil	EPA 8000C	10/01/13 10:20	10/30/13 12:07	1N/A/1N/A	1N/A/1N/A	NA

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Page 36 of 39

**Apex Companies, LLC**

3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**

Project Number: 1975-01

Project Manager: John Foxwell

**Reported:**

11/14/13 17:44

## Notes and Definitions

### Qualifiers:

- B-02 Analyte detected in an associated blank at a level between one-half the MRL and the MRL. (See Notes and Conventions below.)
- C-05 Extract has undergone a GPC (Gel-Permeation Chromatography) cleanup per EPA 3640A. Reporting levels may be raised due to dilution necessary for cleanup. Sample Final Volume includes the GPC dilution factor, see the Prep page for details.
- C-07 Extract has undergone Sulfuric Acid Cleanup by EPA 3665A, Sulfur Cleanup by EPA 3660B, and Florisil Cleanup by EPA 3620B in order to minimize matrix interference.
- EST Result reported as an Estimated Value. Multiple aroclors present and matrix interference
- H-02 This sample was extracted outside of the recommended holding time.
- H-06 This sample was received, or the analysis requested, outside the recommended holding time.
- J Estimated Result. Result detected below the lowest point of the calibration curve, but above the specified MDL.
- Q-01 Spike recovery and/or RPD is outside acceptance limits.
- Q-05 Analyses are not controlled on RPD values from sample or duplicate concentrations below 5 times the reporting level.
- Q-23 Recovery of Continuing Calibration Verification sample above upper control limit for this analyte. Data is likely biased high.
- Q-26 Peak separation for Benzo(b) and Benzo(k)fluoranthenes does not meet method specified criteria. Reported result includes the combined area of the two isomers and should be considered the total of Benzo(b+k)Fluoranthenes.
- Q-31 Estimated Results. Recovery of Continuing Calibration Verification sample below lower control limit for this analyte. Results are likely biased low.
- Q-41 Estimated Results. Recovery of Continuing Calibration Verification sample above upper control limit for this analyte. Results are likely biased high.
- Q-42 Matrix Spike and/or Duplicate analysis was performed on this sample. % Recovery or RPD for this analyte is outside laboratory control limits. (Refer to the QC Section of Analytical Report.)
- R-02 The Reporting Limit for this analyte has been raised to account for interference from coeluting organic compounds present in the sample.
- R-04 Reporting levels elevated due to dilution necessary for analysis.

### Notes and Conventions:

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit

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Portland, OR 97201Project: **Pier 99**

Project Number: 1975-01

Project Manager: John Foxwell

**Reported:**

11/14/13 17:44

NR	Not Reported
dry	Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.
RPD	Relative Percent Difference
MDL	If MDL is not listed, data has been evaluated to the Method Reporting Limit only.
WMSC	Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.
Batch QC	Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.
Blank Policy	Apex assesses blank data for potential high bias down to a level equal to ½ the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.  For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.  Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.
---	QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.
***	Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).



**Reported:**  
11/14/13 17:44

[illegible]

# Apex Labs

12232 S.W. Garden Place  
Tigard, OR 97223  
503-718-2323 Phone  
503-718-0333 Fax

Tuesday, October 22, 2013

John Foxwell  
Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

RE: Pier 99 / 1975-01

Enclosed are the results of analyses for work order A3J0152, which was received by the laboratory on 10/4/2013 at 1:35:00PM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: [DAuvil@apex-labs.com](mailto:DAuvil@apex-labs.com), or by phone at 503-718-2323.

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

**Reported:**  
10/22/13 11:30

## ANALYTICAL REPORT FOR SAMPLES

### SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
REX-17 (0-6)	A3J0152-01	Soil	10/04/13 11:45	10/04/13 13:35
RAC-2 (0-6)	A3J0152-02	Soil	10/04/13 12:00	10/04/13 13:35
Rinsate Drum	A3J0152-03	Water	10/04/13 12:40	10/04/13 13:35

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 11:30

## ANALYTICAL SAMPLE RESULTS

### Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>Rinsate Drum (A3J0152-03RE1)</b>			<b>Matrix: Water</b>		<b>Batch: 3100185</b>			
Acetone	ND	---	20.0	ug/L	1	10/07/13 16:02	EPA 8260B	
Benzene	ND	---	0.250	"	"	"	"	
Bromobenzene	ND	---	0.500	"	"	"	"	
Bromochloromethane	ND	---	1.00	"	"	"	"	
Bromodichloromethane	ND	---	1.00	"	"	"	"	
Bromoform	ND	---	1.00	"	"	"	"	
Bromomethane	ND	---	5.00	"	"	"	"	
2-Butanone (MEK)	ND	---	10.0	"	"	"	"	
n-Butylbenzene	ND	---	1.00	"	"	"	"	
sec-Butylbenzene	ND	---	1.00	"	"	"	"	
tert-Butylbenzene	ND	---	1.00	"	"	"	"	
Carbon tetrachloride	ND	---	0.500	"	"	"	"	
Chlorobenzene	ND	---	0.500	"	"	"	"	
Chloroethane	ND	---	5.00	"	"	"	"	ESTb
Chloroform	ND	---	1.00	"	"	"	"	
Chloromethane	ND	---	5.00	"	"	"	"	
2-Chlorotoluene	ND	---	1.00	"	"	"	"	
4-Chlorotoluene	ND	---	1.00	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	---	5.00	"	"	"	"	
Dibromochloromethane	ND	---	1.00	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	---	0.500	"	"	"	"	
Dibromomethane	ND	---	1.00	"	"	"	"	
1,2-Dichlorobenzene	ND	---	0.500	"	"	"	"	
1,3-Dichlorobenzene	ND	---	0.500	"	"	"	"	
1,4-Dichlorobenzene	ND	---	0.500	"	"	"	"	
Dichlorodifluoromethane	ND	---	1.00	"	"	"	"	
1,1-Dichloroethane	ND	---	0.500	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	---	0.500	"	"	"	"	
1,1-Dichloroethene	ND	---	0.500	"	"	"	"	
cis-1,2-Dichloroethene	ND	---	0.500	"	"	"	"	
trans-1,2-Dichloroethene	ND	---	0.500	"	"	"	"	
1,2-Dichloropropane	ND	---	0.500	"	"	"	"	
1,3-Dichloropropane	ND	---	1.00	"	"	"	"	
2,2-Dichloropropane	ND	---	1.00	"	"	"	"	
1,1-Dichloropropene	ND	---	1.00	"	"	"	"	

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 11:30

## ANALYTICAL SAMPLE RESULTS

### Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>Rinsate Drum (A3J0152-03RE1)</b>			<b>Matrix: Water</b>		<b>Batch: 3100185</b>			
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	"	EPA 8260B	
trans-1,3-Dichloropropene	ND	---	1.00	"	"	"	"	
Ethylbenzene	ND	---	0.500	"	"	"	"	
Hexachlorobutadiene	ND	---	5.00	"	"	"	"	
2-Hexanone	ND	---	10.0	"	"	"	"	
Isopropylbenzene	ND	---	1.00	"	"	"	"	
4-Isopropyltoluene	ND	---	1.00	"	"	"	"	
4-Methyl-2-pentanone (MiBK)	ND	---	10.0	"	"	"	"	
Methyl tert-butyl ether (MTBE)	ND	---	1.00	"	"	"	"	
Methylene chloride	ND	---	5.00	"	"	"	"	
Naphthalene	ND	---	2.00	"	"	"	"	
n-Propylbenzene	ND	---	0.500	"	"	"	"	
Styrene	ND	---	1.00	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	---	0.500	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	---	0.500	"	"	"	"	
Tetrachloroethene (PCE)	ND	---	0.500	"	"	"	"	
Toluene	ND	---	1.00	"	"	"	"	
1,2,3-Trichlorobenzene	ND	---	2.00	"	"	"	"	
1,2,4-Trichlorobenzene	ND	---	2.00	"	"	"	"	
1,1,1-Trichloroethane	ND	---	0.500	"	"	"	"	
1,1,2-Trichloroethane	ND	---	0.500	"	"	"	"	
Trichloroethene (TCE)	ND	---	0.500	"	"	"	"	
Trichlorofluoromethane	ND	---	2.00	"	"	"	"	Q-30
1,2,3-Trichloropropane	ND	---	1.00	"	"	"	"	
1,2,4-Trimethylbenzene	ND	---	1.00	"	"	"	"	
1,3,5-Trimethylbenzene	ND	---	1.00	"	"	"	"	
Vinyl chloride	ND	---	0.500	"	"	"	"	
m,p-Xylene	ND	---	1.00	"	"	"	"	
o-Xylene	ND	---	0.500	"	"	"	"	
<i>Surrogate: Dibromofluoromethane (Surr)</i>		<i>Recovery: 104 %</i>		<i>Limits: 80-120 %</i>		"	"	"
<i>1,4-Difluorobenzene (Surr)</i>		<i>100 %</i>		<i>Limits: 80-120 %</i>		"	"	"
<i>Toluene-d8 (Surr)</i>		<i>103 %</i>		<i>Limits: 80-120 %</i>		"	"	"
<i>4-Bromofluorobenzene (Surr)</i>		<i>104 %</i>		<i>Limits: 80-120 %</i>		"	"	"

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3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 11:30

## ANALYTICAL SAMPLE RESULTS

### Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-17 (0-6) (A3J0152-01)</b>			<b>Matrix: Soil</b>		<b>Batch: 3100175</b>			<b>C-07</b>
Aroclor 1016	ND	---	10.0	ug/kg dry	1	10/07/13 10:40	EPA 8082A	
Aroclor 1221	ND	---	10.0	"	"	"	"	
Aroclor 1232	ND	---	10.0	"	"	"	"	
Aroclor 1242	ND	---	10.0	"	"	"	"	
Aroclor 1248	ND	---	10.0	"	"	"	"	
<b>Aroclor 1254</b>	<b>36.8</b>	---	10.0	"	"	"	"	ESTc
<b>Aroclor 1260</b>	<b>36.3</b>	---	10.0	"	"	"	"	ESTc
Aroclor 1262	ND	---	10.0	"	"	"	"	
Aroclor 1268	ND	---	10.0	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl (Surr)</i>		<i>Recovery: 115 %</i>		<i>Limits: 60-125 %</i>		"	"	<i>Q-23</i>
<b>RAC-2 (0-6) (A3J0152-02RE1)</b>			<b>Matrix: Soil</b>		<b>Batch: 3100175</b>			<b>C-07</b>
Aroclor 1016	ND	---	277	ug/kg dry	20	10/07/13 12:29	EPA 8082A	
Aroclor 1221	ND	---	277	"	"	"	"	
Aroclor 1232	ND	---	277	"	"	"	"	
Aroclor 1242	ND	---	277	"	"	"	"	
Aroclor 1248	ND	---	277	"	"	"	"	
<b>Aroclor 1254</b>	<b>15500</b>	---	277	"	"	"	"	ESTd
<b>Aroclor 1260</b>	<b>2950</b>	---	277	"	"	"	"	ESTd
Aroclor 1262	ND	---	277	"	"	"	"	
Aroclor 1268	ND	---	277	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl (Surr)</i>		<i>Recovery: 123 %</i>		<i>Limits: 60-125 %</i>		"	"	
<b>Rinsate Drum (A3J0152-03)</b>			<b>Matrix: Water</b>		<b>Batch: 3100255</b>			<b>C-07</b>
Aroclor 1016	ND	---	0.108	ug/L	1	10/10/13 13:22	EPA 8082A	
Aroclor 1221	ND	---	0.108	"	"	"	"	
Aroclor 1232	ND	---	0.108	"	"	"	"	
Aroclor 1242	ND	---	0.108	"	"	"	"	
Aroclor 1248	ND	---	0.108	"	"	"	"	
<b>Aroclor 1254</b>	<b>0.200</b>	---	0.108	"	"	"	"	EST
<b>Aroclor 1260</b>	<b>0.133</b>	---	0.108	"	"	"	"	EST
Aroclor 1262	ND	---	0.108	"	"	"	"	
Aroclor 1268	ND	---	0.108	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl (Surr)</i>		<i>Recovery: 90 %</i>		<i>Limits: 40-135 %</i>		"	"	<i>Q-23</i>

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 11:30

## ANALYTICAL SAMPLE RESULTS

## Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
REX-17 (0-6) (A3J0152-01)			Matrix: Soil					
Batch: 3100186								
Antimony	ND	0.592	1.18	mg/kg dry	10	10/07/13 14:28	EPA 6020A	
Cadmium	0.261	0.118	0.237	"	"	"	"	
Chromium	5.78	0.592	1.18	"	"	"	"	
Copper	126	0.592	2.37	"	"	"	"	
Lead	23.8	0.118	0.237	"	"	"	"	
Nickel	9.14	0.592	1.18	"	"	"	"	
Zinc	46.3	2.37	4.74	"	"	"	"	
RAC-2 (0-6) (A3J0152-02)			Matrix: Soil					
Batch: 3100350								
Antimony	14.5	0.804	1.61	mg/kg dry	10	10/11/13 20:50	EPA 6020A	
Cadmium	6.83	0.161	0.322	"	"	"	"	
Chromium	113	0.804	1.61	"	"	"	"	
Copper	7800	4.02	8.04	"	50	10/14/13 12:05	"	
Lead	2300	0.161	0.322	"	10	10/11/13 20:50	"	
Nickel	28.3	0.804	1.61	"	"	"	"	
Zinc	1500	3.22	6.43	"	"	"	"	
Rinsate Drum (A3J0152-03)			Matrix: Water					
Batch: 3100348								
Arsenic	94.9	---	1.00	ug/L	1	10/14/13 16:28	EPA 6020A	
Barium	1680	---	1.00	"	"	"	"	
Cadmium	57.6	---	0.200	"	"	"	"	
Chromium	788	---	1.00	"	"	"	"	
Lead	7190	---	10.0	"	50	10/14/13 16:51	"	
Mercury	26.3	---	4.00	"	"	"	"	
Selenium	4.01	---	1.00	"	1	10/14/13 16:28	"	
Silver	5.70	---	0.200	"	"	"	"	

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Page 6 of 28

Apex Companies, LLC  
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Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 11:30

## ANALYTICAL SAMPLE RESULTS

Percent Dry Weight								
Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-17 (0-6) (A3J0152-01)</b>			<b>Matrix: Soil</b>		<b>Batch: 3100169</b>			
% Solids	93.6	---	1.00	% by Weight	1	10/07/13 10:05	NWTPH-Dx	
<b>RAC-2 (0-6) (A3J0152-02)</b>			<b>Matrix: Soil</b>		<b>Batch: 3100237</b>			
% Solids	68.8	---	1.00	% by Weight	1	10/09/13 10:13	NWTPH-Dx	

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 11:30

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3100156 - EPA 5030B						Water						
Blank (3100156-BLK1)				Prepared: 10/04/13 10:00		Analyzed: 10/04/13 15:03						
EPA 8260B												
Acetone	ND	---	20.0	ug/L	1	---	---	---	---	---	---	
Benzene	ND	---	0.250	"	"	---	---	---	---	---	---	
Bromobenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
Bromochloromethane	ND	---	1.00	"	"	---	---	---	---	---	---	
Bromodichloromethane	ND	---	1.00	"	"	---	---	---	---	---	---	
Bromoform	ND	---	1.00	"	"	---	---	---	---	---	---	
Bromomethane	ND	---	5.00	"	"	---	---	---	---	---	---	
2-Butanone (MEK)	ND	---	10.0	"	"	---	---	---	---	---	---	
n-Butylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
sec-Butylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
tert-Butylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
Carbon tetrachloride	ND	---	0.500	"	"	---	---	---	---	---	---	
Chlorobenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
Chloroethane	ND	---	5.00	"	"	---	---	---	---	---	---	Q-31
Chloroform	ND	---	1.00	"	"	---	---	---	---	---	---	
Chloromethane	ND	---	5.00	"	"	---	---	---	---	---	---	
2-Chlorotoluene	ND	---	1.00	"	"	---	---	---	---	---	---	
4-Chlorotoluene	ND	---	1.00	"	"	---	---	---	---	---	---	
1,2-Dibromo-3-chloroprop ane	ND	---	5.00	"	"	---	---	---	---	---	---	
Dibromochloromethane	ND	---	1.00	"	"	---	---	---	---	---	---	
1,2-Dibromoethane (EDB)	ND	---	0.500	"	"	---	---	---	---	---	---	
Dibromomethane	ND	---	1.00	"	"	---	---	---	---	---	---	
1,2-Dichlorobenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
1,3-Dichlorobenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
1,4-Dichlorobenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
Dichlorodifluoromethane	ND	---	1.00	"	"	---	---	---	---	---	---	
1,1-Dichloroethane	ND	---	0.500	"	"	---	---	---	---	---	---	
1,2-Dichloroethane (EDC)	ND	---	0.500	"	"	---	---	---	---	---	---	
1,1-Dichloroethene	ND	---	0.500	"	"	---	---	---	---	---	---	

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Page 8 of 28

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 11:30

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3100156 - EPA 5030B</b>						<b>Water</b>						
<b>Blank (3100156-BLK1)</b>						Prepared: 10/04/13 10:00 Analyzed: 10/04/13 15:03						
cis-1,2-Dichloroethene	ND	---	0.500	ug/L	"	---	---	---	---	---	---	
trans-1,2-Dichloroethene	ND	---	0.500	"	"	---	---	---	---	---	---	
1,2-Dichloropropane	ND	---	0.500	"	"	---	---	---	---	---	---	
1,3-Dichloropropane	ND	---	1.00	"	"	---	---	---	---	---	---	
2,2-Dichloropropane	ND	---	1.00	"	"	---	---	---	---	---	---	
1,1-Dichloropropene	ND	---	1.00	"	"	---	---	---	---	---	---	
cis-1,3-Dichloropropene	ND	---	1.00	"	"	---	---	---	---	---	---	
trans-1,3-Dichloropropene	ND	---	1.00	"	"	---	---	---	---	---	---	
Ethylbenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
Hexachlorobutadiene	ND	---	5.00	"	"	---	---	---	---	---	---	
2-Hexanone	ND	---	10.0	"	"	---	---	---	---	---	---	
Isopropylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
4-Isopropyltoluene	ND	---	1.00	"	"	---	---	---	---	---	---	
4-Methyl-2-pentanone (MiBK)	ND	---	10.0	"	"	---	---	---	---	---	---	
Methyl tert-butyl ether (MTBE)	ND	---	1.00	"	"	---	---	---	---	---	---	
Methylene chloride	ND	---	5.00	"	"	---	---	---	---	---	---	
Naphthalene	ND	---	2.00	"	"	---	---	---	---	---	---	
n-Propylbenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
Styrene	ND	---	1.00	"	"	---	---	---	---	---	---	
1,1,1,2-Tetrachloroethane	ND	---	0.500	"	"	---	---	---	---	---	---	
1,1,2,2-Tetrachloroethane	ND	---	0.500	"	"	---	---	---	---	---	---	
Tetrachloroethene (PCE)	ND	---	0.500	"	"	---	---	---	---	---	---	
Toluene	ND	---	1.00	"	"	---	---	---	---	---	---	
1,2,3-Trichlorobenzene	ND	---	2.00	"	"	---	---	---	---	---	---	
1,2,4-Trichlorobenzene	ND	---	2.00	"	"	---	---	---	---	---	---	
1,1,1-Trichloroethane	ND	---	0.500	"	"	---	---	---	---	---	---	
1,1,2-Trichloroethane	ND	---	0.500	"	"	---	---	---	---	---	---	
Trichloroethene (TCE)	ND	---	0.500	"	"	---	---	---	---	---	---	
Trichlorofluoromethane	ND	---	2.00	"	"	---	---	---	---	---	---	
1,2,3-Trichloropropane	ND	---	1.00	"	"	---	---	---	---	---	---	

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## Apex Companies, LLC

3015 SW First Avenue  
Portland, OR 97201

Project: Pier 99

Project Number: 1975-01

Project Manager: John Foxwell

Reported:

10/22/13 11:30

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3100156 - EPA 5030B</b>						<b>Water</b>						
<b>Blank (3100156-BLK1)</b>						Prepared: 10/04/13 10:00 Analyzed: 10/04/13 15:03						
1,2,4-Trimethylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
1,3,5-Trimethylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
Vinyl chloride	ND	---	0.500	"	"	---	---	---	---	---	---	
m,p-Xylene	ND	---	1.00	"	"	---	---	---	---	---	---	
o-Xylene	ND	---	0.500	"	"	---	---	---	---	---	---	
<i>Surr: Dibromofluoromethane (Surr)</i>												
			<i>Recovery:</i>	108 %	<i>Limits:</i>	80-120 %	<i>Dilution:</i>	1x				
<i>1,4-Difluorobenzene (Surr)</i>				101 %		80-120 %		"				
<i>Toluene-d8 (Surr)</i>				104 %		80-120 %		"				
<i>4-Bromofluorobenzene (Surr)</i>				105 %		80-120 %		"				

## LCS (3100156-BS1)

Prepared: 10/04/13 10:00 Analyzed: 10/04/13 13:46

## EPA 8260B

Acetone	39.1	---	20.0	ug/L	1	40.0	---	98	70-130%	---	---	
Benzene	20.8	---	0.250	"	"	20.0	---	104	"	---	---	
Bromobenzene	20.4	---	0.500	"	"	"	---	102	"	---	---	
Bromochloromethane	21.2	---	1.00	"	"	"	---	106	"	---	---	
Bromodichloromethane	22.3	---	1.00	"	"	"	---	112	"	---	---	
Bromoform	25.9	---	1.00	"	"	"	---	130	"	---	---	
Bromomethane	22.8	---	5.00	"	"	"	---	114	"	---	---	
2-Butanone (MEK)	42.7	---	10.0	"	"	40.0	---	107	"	---	---	
n-Butylbenzene	22.1	---	1.00	"	"	20.0	---	110	"	---	---	
sec-Butylbenzene	22.3	---	1.00	"	"	"	---	111	"	---	---	
tert-Butylbenzene	21.2	---	1.00	"	"	"	---	106	"	---	---	
Carbon tetrachloride	22.0	---	0.500	"	"	"	---	110	"	---	---	
Chlorobenzene	22.2	---	0.500	"	"	"	---	111	"	---	---	
Chloroethane	16.0	---	5.00	"	"	"	---	80	"	---	---	Q-31
Chloroform	21.5	---	1.00	"	"	"	---	108	"	---	---	
Chloromethane	25.6	---	5.00	"	"	"	---	128	"	---	---	
2-Chlorotoluene	20.3	---	1.00	"	"	"	---	102	"	---	---	
4-Chlorotoluene	20.9	---	1.00	"	"	"	---	105	"	---	---	
1,2-Dibromo-3-chloroprop ane	23.0	---	5.00	"	"	"	---	115	"	---	---	

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Darrell Auvil For Darwin Thomas, Business Development Director

Page 10 of 28

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 11:30

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3100156 - EPA 5030B</b>						<b>Water</b>						
<b>LCS (3100156-BS1)</b>						Prepared: 10/04/13 10:00 Analyzed: 10/04/13 13:46						
Dibromochloromethane	24.0	---	1.00	ug/L	"	"	---	120	"	---	---	
1,2-Dibromoethane (EDB)	22.2	---	0.500	"	"	"	---	111	"	---	---	
Dibromomethane	22.0	---	1.00	"	"	"	---	110	"	---	---	
1,2-Dichlorobenzene	22.9	---	0.500	"	"	"	---	115	"	---	---	
1,3-Dichlorobenzene	22.2	---	0.500	"	"	"	---	111	"	---	---	
1,4-Dichlorobenzene	21.7	---	0.500	"	"	"	---	109	"	---	---	
Dichlorodifluoromethane	25.6	---	1.00	"	"	"	---	128	"	---	---	
1,1-Dichloroethane	22.0	---	0.500	"	"	"	---	110	"	---	---	
1,2-Dichloroethane (EDC)	21.8	---	0.500	"	"	"	---	109	"	---	---	
1,1-Dichloroethene	22.7	---	0.500	"	"	"	---	113	"	---	---	
cis-1,2-Dichloroethene	21.3	---	0.500	"	"	"	---	106	"	---	---	
trans-1,2-Dichloroethene	21.7	---	0.500	"	"	"	---	109	"	---	---	
1,2-Dichloropropane	21.8	---	0.500	"	"	"	---	109	"	---	---	
1,3-Dichloropropane	21.2	---	1.00	"	"	"	---	106	"	---	---	
2,2-Dichloropropane	30.2	---	1.00	"	"	"	---	151	"	---	---	ESTa
1,1-Dichloropropene	20.8	---	1.00	"	"	"	---	104	"	---	---	
cis-1,3-Dichloropropene	21.6	---	1.00	"	"	"	---	108	"	---	---	
trans-1,3-Dichloropropene	24.4	---	1.00	"	"	"	---	122	"	---	---	
Ethylbenzene	21.5	---	0.500	"	"	"	---	108	"	---	---	
Hexachlorobutadiene	22.1	---	5.00	"	"	"	---	111	"	---	---	
2-Hexanone	46.2	---	10.0	"	"	40.0	---	116	"	---	---	
Isopropylbenzene	22.4	---	1.00	"	"	20.0	---	112	"	---	---	
4-Isopropyltoluene	22.6	---	1.00	"	"	"	---	113	"	---	---	
4-Methyl-2-pentanone (MiBK)	45.1	---	10.0	"	"	40.0	---	113	"	---	---	
Methyl tert-butyl ether (MTBE)	28.2	---	1.00	"	"	20.0	---	141	"	---	---	ESTa
Methylene chloride	20.5	---	5.00	"	"	"	---	103	"	---	---	
Naphthalene	21.9	---	2.00	"	"	"	---	110	"	---	---	
n-Propylbenzene	20.8	---	0.500	"	"	"	---	104	"	---	---	
Styrene	23.5	---	1.00	"	"	"	---	118	"	---	---	
1,1,1,2-Tetrachloroethane	22.8	---	0.500	"	"	"	---	114	"	---	---	

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Darrell Auvil For Darwin Thomas, Business Development Director

## Apex Companies, LLC

3015 SW First Avenue  
Portland, OR 97201

Project: Pier 99

Project Number: 1975-01

Project Manager: John Foxwell

Reported:

10/22/13 11:30

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3100156 - EPA 5030B</b>						<b>Water</b>						
<b>LCS (3100156-BS1)</b>						Prepared: 10/04/13 10:00 Analyzed: 10/04/13 13:46						
1,1,2,2-Tetrachloroethane	21.8	---	0.500	"	"	"	---	109	"	---	---	
Tetrachloroethene (PCE)	21.3	---	0.500	"	"	"	---	107	"	---	---	
Toluene	21.2	---	1.00	"	"	"	---	106	"	---	---	
1,2,3-Trichlorobenzene	22.7	---	2.00	"	"	"	---	114	"	---	---	
1,2,4-Trichlorobenzene	22.9	---	2.00	"	"	"	---	115	"	---	---	
1,1,1-Trichloroethane	23.0	---	0.500	"	"	"	---	115	"	---	---	
1,1,2-Trichloroethane	22.5	---	0.500	"	"	"	---	112	"	---	---	
Trichloroethene (TCE)	21.3	---	0.500	"	"	"	---	107	"	---	---	
Trichlorofluoromethane	18.2	---	2.00	"	"	"	---	91	"	---	---	
1,2,3-Trichloropropane	20.8	---	1.00	"	"	"	---	104	"	---	---	
1,2,4-Trimethylbenzene	22.1	---	1.00	"	"	"	---	110	"	---	---	
1,3,5-Trimethylbenzene	22.4	---	1.00	"	"	"	---	112	"	---	---	
Vinyl chloride	25.6	---	0.500	"	"	"	---	128	"	---	---	
m,p-Xylene	44.3	---	1.00	"	"	40.0	---	111	"	---	---	
o-Xylene	22.4	---	0.500	"	"	20.0	---	112	"	---	---	
<i>Surr: Dibromofluoromethane (Surr) Recovery: 104 % Limits: 80-120 % Dilution: 1x</i>												
<i>1,4-Difluorobenzene (Surr) 101 % 80-120 % "</i>												
<i>Toluene-d8 (Surr) 103 % 80-120 % "</i>												
<i>4-Bromofluorobenzene (Surr) 100 % 80-120 % "</i>												

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Darrell Auvil For Darwin Thomas, Business Development Director

Page 12 of 28

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: Pier 99  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 11:30

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3100185 - EPA 5030B						Water						
Blank (3100185-BLK1)						Prepared: 10/07/13 10:00		Analyzed: 10/07/13 13:49				
EPA 8260B												
Acetone	ND	---	20.0	ug/L	1	---	---	---	---	---	---	
Benzene	ND	---	0.250	"	"	---	---	---	---	---	---	
Bromobenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
Bromochloromethane	ND	---	1.00	"	"	---	---	---	---	---	---	
Bromodichloromethane	ND	---	1.00	"	"	---	---	---	---	---	---	
Bromoform	ND	---	1.00	"	"	---	---	---	---	---	---	
Bromomethane	ND	---	5.00	"	"	---	---	---	---	---	---	
2-Butanone (MEK)	ND	---	10.0	"	"	---	---	---	---	---	---	
n-Butylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
sec-Butylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
tert-Butylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
Carbon tetrachloride	ND	---	0.500	"	"	---	---	---	---	---	---	
Chlorobenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
Chloroethane	ND	---	5.00	"	"	---	---	---	---	---	---	ESTb
Chloroform	ND	---	1.00	"	"	---	---	---	---	---	---	
Chloromethane	ND	---	5.00	"	"	---	---	---	---	---	---	
2-Chlorotoluene	ND	---	1.00	"	"	---	---	---	---	---	---	
4-Chlorotoluene	ND	---	1.00	"	"	---	---	---	---	---	---	
1,2-Dibromo-3-chloroprop ane	ND	---	5.00	"	"	---	---	---	---	---	---	
Dibromochloromethane	ND	---	1.00	"	"	---	---	---	---	---	---	
1,2-Dibromoethane (EDB)	ND	---	0.500	"	"	---	---	---	---	---	---	
Dibromomethane	ND	---	1.00	"	"	---	---	---	---	---	---	
1,2-Dichlorobenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
1,3-Dichlorobenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
1,4-Dichlorobenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
Dichlorodifluoromethane	ND	---	1.00	"	"	---	---	---	---	---	---	
1,1-Dichloroethane	ND	---	0.500	"	"	---	---	---	---	---	---	
1,2-Dichloroethane (EDC)	ND	---	0.500	"	"	---	---	---	---	---	---	
1,1-Dichloroethene	ND	---	0.500	"	"	---	---	---	---	---	---	

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 11:30

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3100185 - EPA 5030B</b>						<b>Water</b>						
<b>Blank (3100185-BLK1)</b>						Prepared: 10/07/13 10:00 Analyzed: 10/07/13 13:49						
cis-1,2-Dichloroethene	ND	---	0.500	ug/L	"	---	---	---	---	---	---	
trans-1,2-Dichloroethene	ND	---	0.500	"	"	---	---	---	---	---	---	
1,2-Dichloropropane	ND	---	0.500	"	"	---	---	---	---	---	---	
1,3-Dichloropropane	ND	---	1.00	"	"	---	---	---	---	---	---	
2,2-Dichloropropane	ND	---	1.00	"	"	---	---	---	---	---	---	
1,1-Dichloropropene	ND	---	1.00	"	"	---	---	---	---	---	---	
cis-1,3-Dichloropropene	ND	---	1.00	"	"	---	---	---	---	---	---	
trans-1,3-Dichloropropene	ND	---	1.00	"	"	---	---	---	---	---	---	
Ethylbenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
Hexachlorobutadiene	ND	---	5.00	"	"	---	---	---	---	---	---	
2-Hexanone	ND	---	10.0	"	"	---	---	---	---	---	---	
Isopropylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
4-Isopropyltoluene	ND	---	1.00	"	"	---	---	---	---	---	---	
4-Methyl-2-pentanone (MiBK)	ND	---	10.0	"	"	---	---	---	---	---	---	
Methyl tert-butyl ether (MTBE)	ND	---	1.00	"	"	---	---	---	---	---	---	
Methylene chloride	ND	---	5.00	"	"	---	---	---	---	---	---	
Naphthalene	ND	---	2.00	"	"	---	---	---	---	---	---	
n-Propylbenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
Styrene	ND	---	1.00	"	"	---	---	---	---	---	---	
1,1,1,2-Tetrachloroethane	ND	---	0.500	"	"	---	---	---	---	---	---	
1,1,2,2-Tetrachloroethane	ND	---	0.500	"	"	---	---	---	---	---	---	
Tetrachloroethene (PCE)	ND	---	0.500	"	"	---	---	---	---	---	---	
Toluene	ND	---	1.00	"	"	---	---	---	---	---	---	
1,2,3-Trichlorobenzene	ND	---	2.00	"	"	---	---	---	---	---	---	
1,2,4-Trichlorobenzene	ND	---	2.00	"	"	---	---	---	---	---	---	
1,1,1-Trichloroethane	ND	---	0.500	"	"	---	---	---	---	---	---	
1,1,2-Trichloroethane	ND	---	0.500	"	"	---	---	---	---	---	---	
Trichloroethene (TCE)	ND	---	0.500	"	"	---	---	---	---	---	---	
Trichlorofluoromethane	ND	---	2.00	"	"	---	---	---	---	---	---	Q-30
1,2,3-Trichloropropane	ND	---	1.00	"	"	---	---	---	---	---	---	

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## Apex Companies, LLC

3015 SW First Avenue  
Portland, OR 97201

Project: Pier 99

Project Number: 1975-01

Project Manager: John Foxwell

Reported:

10/22/13 11:30

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3100185 - EPA 5030B</b>						<b>Water</b>						
<b>Blank (3100185-BLK1)</b>						Prepared: 10/07/13 10:00 Analyzed: 10/07/13 13:49						
1,2,4-Trimethylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
1,3,5-Trimethylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
Vinyl chloride	ND	---	0.500	"	"	---	---	---	---	---	---	
m,p-Xylene	ND	---	1.00	"	"	---	---	---	---	---	---	
o-Xylene	ND	---	0.500	"	"	---	---	---	---	---	---	
<i>Surr: Dibromofluoromethane (Surr)</i>			<i>Recovery: 101 %</i>	<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>1,4-Difluorobenzene (Surr)</i>			<i>99 %</i>	<i>80-120 %</i>		<i>"</i>						
<i>Toluene-d8 (Surr)</i>			<i>101 %</i>	<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>			<i>103 %</i>	<i>80-120 %</i>		<i>"</i>						

## LCS (3100185-BS1)

Prepared: 10/07/13 10:00 Analyzed: 10/07/13 12:31

## EPA 8260B

Acetone	32.3	---	20.0	ug/L	1	40.0	---	81	70-130%	---	---	
Benzene	16.6	---	0.250	"	"	20.0	---	83	"	---	---	
Bromobenzene	18.6	---	0.500	"	"	"	---	93	"	---	---	
Bromochloromethane	16.9	---	1.00	"	"	"	---	85	"	---	---	
Bromodichloromethane	18.3	---	1.00	"	"	"	---	91	"	---	---	
Bromoform	22.6	---	1.00	"	"	"	---	113	"	---	---	
Bromomethane	17.3	---	5.00	"	"	"	---	86	"	---	---	
2-Butanone (MEK)	38.9	---	10.0	"	"	40.0	---	97	"	---	---	
n-Butylbenzene	18.6	---	1.00	"	"	20.0	---	93	"	---	---	
sec-Butylbenzene	18.7	---	1.00	"	"	"	---	94	"	---	---	
tert-Butylbenzene	18.4	---	1.00	"	"	"	---	92	"	---	---	
Carbon tetrachloride	17.5	---	0.500	"	"	"	---	87	"	---	---	
Chlorobenzene	18.6	---	0.500	"	"	"	---	93	"	---	---	
Chloroethane	12.0	---	5.00	"	"	"	---	60	"	---	---	ESTb
Chloroform	17.3	---	1.00	"	"	"	---	87	"	---	---	
Chloromethane	21.7	---	5.00	"	"	"	---	108	"	---	---	
2-Chlorotoluene	17.8	---	1.00	"	"	"	---	89	"	---	---	
4-Chlorotoluene	18.0	---	1.00	"	"	"	---	90	"	---	---	
1,2-Dibromo-3-chloroprop ane	21.0	---	5.00	"	"	"	---	105	"	---	---	

Apex Laboratories

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 11:30

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3100185 - EPA 5030B</b>						<b>Water</b>						
<b>LCS (3100185-BS1)</b>						Prepared: 10/07/13 10:00 Analyzed: 10/07/13 12:31						
Dibromochloromethane	21.0	---	1.00	ug/L	"	"	---	105	"	---	---	
1,2-Dibromoethane (EDB)	19.5	---	0.500	"	"	"	---	98	"	---	---	
Dibromomethane	18.2	---	1.00	"	"	"	---	91	"	---	---	
1,2-Dichlorobenzene	19.2	---	0.500	"	"	"	---	96	"	---	---	
1,3-Dichlorobenzene	19.2	---	0.500	"	"	"	---	96	"	---	---	
1,4-Dichlorobenzene	18.8	---	0.500	"	"	"	---	94	"	---	---	
Dichlorodifluoromethane	17.0	---	1.00	"	"	"	---	85	"	---	---	
1,1-Dichloroethane	17.7	---	0.500	"	"	"	---	88	"	---	---	
1,2-Dichloroethane (EDC)	17.7	---	0.500	"	"	"	---	88	"	---	---	
1,1-Dichloroethene	16.7	---	0.500	"	"	"	---	84	"	---	---	
cis-1,2-Dichloroethene	17.4	---	0.500	"	"	"	---	87	"	---	---	
trans-1,2-Dichloroethene	17.5	---	0.500	"	"	"	---	87	"	---	---	
1,2-Dichloropropane	17.8	---	0.500	"	"	"	---	89	"	---	---	
1,3-Dichloropropane	18.2	---	1.00	"	"	"	---	91	"	---	---	
2,2-Dichloropropane	26.0	---	1.00	"	"	"	---	130	"	---	---	
1,1-Dichloropropene	16.4	---	1.00	"	"	"	---	82	"	---	---	
cis-1,3-Dichloropropene	18.6	---	1.00	"	"	"	---	93	"	---	---	
trans-1,3-Dichloropropene	21.4	---	1.00	"	"	"	---	107	"	---	---	
Ethylbenzene	17.8	---	0.500	"	"	"	---	89	"	---	---	
Hexachlorobutadiene	18.4	---	5.00	"	"	"	---	92	"	---	---	
2-Hexanone	43.1	---	10.0	"	"	40.0	---	108	"	---	---	
Isopropylbenzene	18.2	---	1.00	"	"	20.0	---	91	"	---	---	
4-Isopropyltoluene	19.3	---	1.00	"	"	"	---	96	"	---	---	
4-Methyl-2-pentanone (MiBK)	41.5	---	10.0	"	"	40.0	---	104	"	---	---	
Methyl tert-butyl ether (MTBE)	23.4	---	1.00	"	"	20.0	---	117	"	---	---	
Methylene chloride	16.9	---	5.00	"	"	"	---	84	"	---	---	
Naphthalene	18.9	---	2.00	"	"	"	---	94	"	---	---	
n-Propylbenzene	18.5	---	0.500	"	"	"	---	92	"	---	---	
Styrene	19.3	---	1.00	"	"	"	---	96	"	---	---	
1,1,1,2-Tetrachloroethane	19.1	---	0.500	"	"	"	---	95	"	---	---	

Apex Laboratories

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Darrell Auvil For Darwin Thomas, Business Development Director

## Apex Companies, LLC

3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**

Project Number: 1975-01

Project Manager: John Foxwell

Reported:

10/22/13 11:30

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3100185 - EPA 5030B</b>						<b>Water</b>						
<b>LCS (3100185-BS1)</b>						Prepared: 10/07/13 10:00 Analyzed: 10/07/13 12:31						
1,1,2,2-Tetrachloroethane	20.5	---	0.500	"	"	"	---	102	"	---	---	
Tetrachloroethene (PCE)	17.5	---	0.500	"	"	"	---	88	"	---	---	
Toluene	18.1	---	1.00	"	"	"	---	90	"	---	---	
1,2,3-Trichlorobenzene	18.6	---	2.00	"	"	"	---	93	"	---	---	
1,2,4-Trichlorobenzene	19.1	---	2.00	"	"	"	---	96	"	---	---	
1,1,1-Trichloroethane	18.1	---	0.500	"	"	"	---	91	"	---	---	
1,1,2-Trichloroethane	19.2	---	0.500	"	"	"	---	96	"	---	---	
Trichloroethene (TCE)	17.4	---	0.500	"	"	"	---	87	"	---	---	
Trichlorofluoromethane	13.7	---	2.00	"	"	"	---	69	"	---	---	Q-30
1,2,3-Trichloropropane	20.3	---	1.00	"	"	"	---	101	"	---	---	
1,2,4-Trimethylbenzene	19.5	---	1.00	"	"	"	---	98	"	---	---	
1,3,5-Trimethylbenzene	19.3	---	1.00	"	"	"	---	97	"	---	---	
Vinyl chloride	18.5	---	0.500	"	"	"	---	93	"	---	---	
m,p-Xylene	37.2	---	1.00	"	"	40.0	---	93	"	---	---	
o-Xylene	18.7	---	0.500	"	"	20.0	---	93	"	---	---	
Surr: Dibromofluoromethane (Surr)		Recovery: 99 %		Limits: 80-120 %		Dilution: 1x						
1,4-Difluorobenzene (Surr)		100 %		80-120 %		"						
Toluene-d8 (Surr)		102 %		80-120 %		"						
4-Bromofluorobenzene (Surr)		102 %		80-120 %		"						

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Darrell Auvil For Darwin Thomas, Business Development Director

Page 17 of 28

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 11:30

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3100175 - EPA 3546						Soil						
Blank (3100175-BLK1)				Prepared: 10/05/13 09:49		Analyzed: 10/07/13 10:03					C-07	
EPA 8082A												
Aroclor 1016	ND	---	8.33	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1221	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1232	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1242	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1248	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1254	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1260	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1262	ND	---	8.33	"	"	---	---	---	---	---	---	
Aroclor 1268	ND	---	8.33	"	"	---	---	---	---	---	---	
Surr: Decachlorobiphenyl (Surr)		Recovery: 120 %		Limits: 60-125 %		Dilution: 1x		Q-23				
LCS (3100175-BS1)				Prepared: 10/05/13 09:49		Analyzed: 10/07/13 10:21					C-07, Q-18	
EPA 8082A												
Aroclor 1016	295	---	10.0	ug/kg wet	1	250	---	118	40-140%	---	---	
Aroclor 1260	261	---	10.0	"	"	"	---	104	60-130%	---	---	
Surr: Decachlorobiphenyl (Surr)		Recovery: 124 %		Limits: 60-125 %		Dilution: 1x		Q-23				

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 11:30

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3100255 - EPA 3510C (Neutral pH)						Water						
Blank (3100255-BLK1)				Prepared: 10/09/13 07:16		Analyzed: 10/10/13 11:16					C-07	
EPA 8082A												
Aroclor 1016	ND	---	0.0909	ug/L	1	---	---	---	---	---	---	
Aroclor 1221	ND	---	0.0909	"	"	---	---	---	---	---	---	
Aroclor 1232	ND	---	0.0909	"	"	---	---	---	---	---	---	
Aroclor 1242	ND	---	0.0909	"	"	---	---	---	---	---	---	
Aroclor 1248	ND	---	0.0909	"	"	---	---	---	---	---	---	
Aroclor 1254	ND	---	0.0909	"	"	---	---	---	---	---	---	
Aroclor 1260	ND	---	0.0909	"	"	---	---	---	---	---	---	
Aroclor 1262	ND	---	0.0909	"	"	---	---	---	---	---	---	
Aroclor 1268	ND	---	0.0909	"	"	---	---	---	---	---	---	
Surr: Decachlorobiphenyl (Surr)		Recovery: 95 %		Limits: 40-135 %		Dilution: 1x					Q-23	
LCS (3100255-BS1)				Prepared: 10/09/13 07:16		Analyzed: 10/10/13 11:34					C-07	
EPA 8082A												
Aroclor 1016	2.31	---	0.100	ug/L	1	2.50	---	92	40-140%	---	---	
Aroclor 1260	2.01	---	0.100	"	"	"	---	80	"	---	---	
Surr: Decachlorobiphenyl (Surr)		Recovery: 90 %		Limits: 40-135 %		Dilution: 1x					Q-23	
LCS Dup (3100255-BSD1)				Prepared: 10/09/13 07:16		Analyzed: 10/10/13 11:52					C-07, Q-19	
EPA 8082A												
Aroclor 1016	2.19	---	0.100	ug/L	1	2.50	---	87	40-140%	5	30%	
Aroclor 1260	2.12	---	0.100	"	"	"	---	85	"	5	30%	
Surr: Decachlorobiphenyl (Surr)		Recovery: 90 %		Limits: 40-135 %		Dilution: 1x					Q-23	

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 11:30

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3100186 - EPA 3051A						Soil						
Blank (3100186-BLK1)						Prepared: 10/07/13 09:42		Analyzed: 10/07/13 13:48				
EPA 6020A												
Antimony	ND	0.500	1.00	mg/kg wet	10	---	---	---	---	---	---	
Cadmium	ND	0.100	0.200	"	"	---	---	---	---	---	---	
Chromium	ND	0.500	1.00	"	"	---	---	---	---	---	---	
Copper	ND	0.500	2.00	"	"	---	---	---	---	---	---	
Lead	ND	0.100	0.200	"	"	---	---	---	---	---	---	
Nickel	ND	0.500	1.00	"	"	---	---	---	---	---	---	
Zinc	ND	2.00	4.00	"	"	---	---	---	---	---	---	
LCS (3100186-BS1)						Prepared: 10/07/13 09:42		Analyzed: 10/07/13 13:51				
EPA 6020A												
Antimony	26.0	0.500	1.00	mg/kg wet	10	25.0	---	104	80-120%	---	---	
Cadmium	51.7	0.100	0.200	"	"	50.0	---	103	"	---	---	
Chromium	52.4	0.500	1.00	"	"	"	---	105	"	---	---	
Copper	54.5	0.500	2.00	"	"	"	---	109	"	---	---	
Lead	54.0	0.100	0.200	"	"	"	---	108	"	---	---	
Nickel	53.2	0.500	1.00	"	"	"	---	106	"	---	---	
Zinc	53.4	2.00	4.00	"	"	"	---	107	"	---	---	

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 11:30

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3100348 - EPA 3015A						Water						
Blank (3100348-BLK1)						Prepared: 10/11/13 10:08		Analyzed: 10/14/13 16:22				
EPA 6020A												
Arsenic	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Barium	ND	---	1.00	"	"	---	---	---	---	---	---	
Chromium	ND	---	1.00	"	"	---	---	---	---	---	---	
Lead	ND	---	0.200	"	"	---	---	---	---	---	---	
Mercury	ND	---	0.0800	"	"	---	---	---	---	---	---	
Silver	ND	---	0.200	"	"	---	---	---	---	---	---	
Blank (3100348-BLK2)						Prepared: 10/11/13 10:08		Analyzed: 10/15/13 11:08				
EPA 6020A												
Cadmium	ND	---	0.200	ug/L	1	---	---	---	---	---	---	Q-16
Selenium	ND	---	1.00	"	"	---	---	---	---	---	---	Q-16
LCS (3100348-BS1)						Prepared: 10/11/13 10:08		Analyzed: 10/14/13 16:25				
EPA 6020A												
Arsenic	55.5	---	1.00	ug/L	1	55.6	---	100	85-115%	---	---	
Barium	57.9	---	1.00	"	"	"	---	104	80-120%	---	---	
Cadmium	55.5	---	0.200	"	"	"	---	100	"	---	---	
Chromium	57.5	---	1.00	"	"	"	---	103	"	---	---	
Lead	57.7	---	0.200	"	"	"	---	104	"	---	---	
Mercury	1.06	---	0.0800	"	"	1.11	---	96	"	---	---	
Silver	28.0	---	0.200	"	"	27.8	---	101	"	---	---	
LCS (3100348-BS2)						Prepared: 10/11/13 10:08		Analyzed: 10/15/13 11:11				
EPA 6020A												
Selenium	26.6	---	1.00	ug/L	1	27.8	---	96	80-120%	---	---	Q-16

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 11:30

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3100350 - EPA 3051A						Soil						
Blank (3100350-BLK2)						Prepared: 10/11/13 11:03		Analyzed: 10/11/13 20:18				
EPA 6020A												
Antimony	ND	0.500	1.00	mg/kg wet	10	---	---	---	---	---	---	Q-16
Cadmium	ND	0.100	0.200	"	"	---	---	---	---	---	---	Q-16
Chromium	ND	0.500	1.00	"	"	---	---	---	---	---	---	Q-16
Copper	ND	0.500	4.00	"	"	---	---	---	---	---	---	Q-16
Lead	ND	0.100	0.200	"	"	---	---	---	---	---	---	Q-16
Nickel	ND	0.500	1.00	"	"	---	---	---	---	---	---	Q-16
Zinc	ND	2.00	4.00	"	"	---	---	---	---	---	---	Q-16
Blank (3100350-BLK3)						Prepared: 10/11/13 11:03		Analyzed: 10/14/13 11:57				
EPA 6020A												
Antimony	ND	0.500	1.00	mg/kg wet	10	---	---	---	---	---	---	Q-16
LCS (3100350-BS2)						Prepared: 10/11/13 11:03		Analyzed: 10/11/13 20:30				
EPA 6020A												
Antimony	26.4	0.500	1.00	mg/kg wet	10	25.0	---	106	80-120%	---	---	Q-16
Cadmium	51.7	0.100	0.200	"	"	50.0	---	103	"	---	---	Q-16
Chromium	52.1	0.500	1.00	"	"	"	---	104	"	---	---	Q-16
Copper	52.3	0.500	4.00	"	"	"	---	105	"	---	---	Q-16
Lead	53.6	0.100	0.200	"	"	"	---	107	"	---	---	Q-16
Nickel	51.9	0.500	1.00	"	"	"	---	104	"	---	---	Q-16
Zinc	55.5	2.00	4.00	"	"	"	---	111	"	---	---	Q-16

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Darrell Auvil For Darwin Thomas, Business Development Director

Page 22 of 28

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
10/22/13 11:30

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----	-----------------	-------	------	--------------	---------------	------	-------------	-----	-----------	-------

#### Batch 3100169 - Total Solids (Dry Weight)

Soil

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

#### Batch 3100237 - Total Solids (Dry Weight)

Soil

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: Pier 99  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
10/22/13 11:30

## SAMPLE PREPARATION INFORMATION

## Volatile Organic Compounds by EPA 8260B

## Prep: EPA 5030B

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3100185							
A3J0152-03RE1	Water	EPA 8260B	10/04/13 12:40	10/07/13 12:56	5mL/5mL	5mL/5mL	1.00

## Polychlorinated Biphenyls by EPA 8082A

## Prep: EPA 3510C (Neutral pH)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3100255							
A3J0152-03	Water	EPA 8082A	10/04/13 12:40	10/09/13 07:16	930mL/5mL	1000mL/5mL	1.08

## Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3100175							
A3J0152-01	Soil	EPA 8082A	10/04/13 11:45	10/05/13 09:49	10.67g/5mL	10g/5mL	0.94
A3J0152-02RE1	Soil	EPA 8082A	10/04/13 12:00	10/05/13 09:49	10.5g/5mL	10g/5mL	0.95

## Total Metals by EPA 6020 (ICPMS)

## Prep: EPA 3015A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3100348							
A3J0152-03	Water	EPA 6020A	10/04/13 12:40	10/11/13 10:08	45mL/50mL	45mL/50mL	1.00

## Prep: EPA 3051A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3100186							
A3J0152-01	Soil	EPA 6020A	10/04/13 11:45	10/07/13 09:42	0.451g/50mL	0.5g/50mL	1.11
Batch: 3100350							
A3J0152-02	Soil	EPA 6020A	10/04/13 12:00	10/11/13 11:03	0.452g/50mL	0.5g/50mL	1.11

## Percent Dry Weight

## Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3100169							
A3J0152-01	Soil	NWTPH-Dx	10/04/13 11:45	10/04/13 16:35	1N/A/1N/A	1N/A/1N/A	NA
Batch: 3100237							
A3J0152-02	Soil	NWTPH-Dx	10/04/13 12:00	10/08/13 14:04	1N/A/1N/A	1N/A/1N/A	NA

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

**Reported:**  
10/22/13 11:30

## SAMPLE PREPARATION INFORMATION

### Percent Dry Weight

#### Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
------------	--------	--------	---------	----------	-------------------------	--------------------------	-------------------

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Darrell Auvin For Darwin Thomas, Business Development Director

**Apex Companies, LLC**

3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**

Project Number: 1975-01  
Project Manager: John Foxwell

**Reported:**  
10/22/13 11:30

## Notes and Definitions

### Qualifiers:

- C-07 Extract has undergone Sulfuric Acid Cleanup by EPA 3665A, Sulfur Cleanup by EPA 3660B, and Florisil Cleanup by EPA 3620B in order to minimize matrix interference.
- EST Result reported as an Estimated Value. Multiple aroclors present and matrix interference
- ESTa Result reported as an Estimated Value. Recovery for Lab Control Spike (LCS) is above the upper control limit. Data may be biased high.
- ESTb Result reported as an Estimated Value. Recovery for Lab Control Spike (LCS) is below the lower control limit. Data may be biased low.
- ESTc Result reported as an Estimated Value. Results estimated due to multiple aroclors and matrix interference present
- ESTd Result reported as an Estimated Value. Results estimated due to multiple aroclors and matrix interference
- Q-16 Reanalysis of an original Batch QC sample.
- Q-18 Matrix Spike results for this extraction batch are not reported due to the high dilution necessary for analysis of the source sample.
- Q-19 Blank Spike Duplicate (BSD) sample analyzed in place of Matrix Spike/Duplicate samples due to limited sample amount available for analysis.
- Q-23 Recovery of Continuing Calibration Verification sample above upper control limit for this analyte. Data is likely biased high.
- Q-30 Recovery for Lab Control Spike (LCS) is below the lower control limit. Data may be biased low.
- Q-31 Estimated Results. Recovery of Continuing Calibration Verification sample below lower control limit for this analyte. Results are likely biased low.

### Notes and Conventions:

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.
- RPD Relative Percent Difference
- MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.
- WMSC Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.
- Batch QC Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.
- Blank Policy Apex assesses blank data for potential high bias down to a level equal to 1/2 the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.  
  
For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.

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Darrell Auvin For Darwin Thomas, Business Development Director

**Apex Companies, LLC**

3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**

Project Number: 1975-01

Project Manager: John Foxwell

**Reported:**

10/22/13 11:30

Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.

--- QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

\*\*\* Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

---

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**Apex Companies, LLC**  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

**Reported:**  
10/22/13 11:30

[illegible]

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# Apex Labs

12232 S.W. Garden Place  
Tigard, OR 97223  
503-718-2323 Phone  
503-718-0333 Fax

Wednesday, February 19, 2014

John Foxwell  
Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

RE: Pier 99 / 1975-01

Enclosed are the results of analyses for work order A4B0365, which was received by the laboratory on 2/17/2014 at 3:17:00PM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: [DAuvil@apex-labs.com](mailto:DAuvil@apex-labs.com), or by phone at 503-718-2323.

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Page 1 of 16

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

**Reported:**  
02/19/14 17:59

## ANALYTICAL REPORT FOR SAMPLES

### SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
EECA Decon Water	A4B0365-01	Water	02/17/14 14:21	02/17/14 15:17

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
02/19/14 17:59

## ANALYTICAL SAMPLE RESULTS

### Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>EECA Decon Water (A4B0365-01)</b>			<b>Matrix: Water</b>		<b>Batch: 4020360</b>			
Acetone	ND	---	20.0	ug/L	1	02/18/14 12:01	EPA 8260B	
Benzene	ND	---	0.250	"	"	"	"	
Bromobenzene	ND	---	0.500	"	"	"	"	
Bromochloromethane	ND	---	1.00	"	"	"	"	
Bromodichloromethane	ND	---	1.00	"	"	"	"	
Bromoform	ND	---	1.00	"	"	"	"	
Bromomethane	ND	---	5.00	"	"	"	"	
2-Butanone (MEK)	ND	---	10.0	"	"	"	"	
n-Butylbenzene	ND	---	1.00	"	"	"	"	
sec-Butylbenzene	ND	---	1.00	"	"	"	"	
tert-Butylbenzene	ND	---	1.00	"	"	"	"	
Carbon tetrachloride	ND	---	0.500	"	"	"	"	
Chlorobenzene	ND	---	0.500	"	"	"	"	
Chloroethane	ND	---	5.00	"	"	"	"	
Chloroform	ND	---	2.00	"	"	"	"	
Chloromethane	ND	---	5.00	"	"	"	"	
2-Chlorotoluene	ND	---	1.00	"	"	"	"	
4-Chlorotoluene	ND	---	1.00	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	---	5.00	"	"	"	"	
Dibromochloromethane	ND	---	1.00	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	---	0.500	"	"	"	"	
Dibromomethane	ND	---	1.00	"	"	"	"	
1,2-Dichlorobenzene	ND	---	0.500	"	"	"	"	
1,3-Dichlorobenzene	ND	---	0.500	"	"	"	"	
1,4-Dichlorobenzene	ND	---	0.500	"	"	"	"	
Dichlorodifluoromethane	ND	---	1.00	"	"	"	"	
1,1-Dichloroethane	ND	---	0.500	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	---	0.500	"	"	"	"	
1,1-Dichloroethene	ND	---	0.500	"	"	"	"	
cis-1,2-Dichloroethene	ND	---	0.500	"	"	"	"	
trans-1,2-Dichloroethene	ND	---	0.500	"	"	"	"	
1,2-Dichloropropane	ND	---	0.500	"	"	"	"	
1,3-Dichloropropane	ND	---	1.00	"	"	"	"	
2,2-Dichloropropane	ND	---	1.00	"	"	"	"	
1,1-Dichloropropene	ND	---	1.00	"	"	"	"	Q-30

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Project Number: 1975-01  
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## ANALYTICAL SAMPLE RESULTS

### Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>EECA Decon Water (A4B0365-01)</b>			<b>Matrix: Water</b>		<b>Batch: 4020360</b>			
cis-1,3-Dichloropropene	ND	---	1.00	ug/L	1	"	EPA 8260B	
trans-1,3-Dichloropropene	ND	---	1.00	"	"	"	"	
Ethylbenzene	ND	---	0.500	"	"	"	"	
Hexachlorobutadiene	ND	---	5.00	"	"	"	"	
2-Hexanone	ND	---	10.0	"	"	"	"	
Isopropylbenzene	ND	---	1.00	"	"	"	"	
4-Isopropyltoluene	ND	---	1.00	"	"	"	"	
4-Methyl-2-pentanone (MiBK)	ND	---	10.0	"	"	"	"	
Methyl tert-butyl ether (MTBE)	ND	---	1.00	"	"	"	"	
Methylene chloride	ND	---	5.00	"	"	"	"	
Naphthalene	ND	---	2.00	"	"	"	"	
n-Propylbenzene	ND	---	0.500	"	"	"	"	
Styrene	ND	---	1.00	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	---	0.500	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	---	0.500	"	"	"	"	
Tetrachloroethene (PCE)	ND	---	0.500	"	"	"	"	
Toluene	ND	---	1.00	"	"	"	"	
1,2,3-Trichlorobenzene	ND	---	2.00	"	"	"	"	
1,2,4-Trichlorobenzene	ND	---	2.00	"	"	"	"	
1,1,1-Trichloroethane	ND	---	0.500	"	"	"	"	
1,1,2-Trichloroethane	ND	---	0.500	"	"	"	"	
Trichloroethene (TCE)	ND	---	0.500	"	"	"	"	
Trichlorofluoromethane	ND	---	2.00	"	"	"	"	
1,2,3-Trichloropropane	ND	---	1.00	"	"	"	"	
1,2,4-Trimethylbenzene	ND	---	1.00	"	"	"	"	
1,3,5-Trimethylbenzene	ND	---	1.00	"	"	"	"	
Vinyl chloride	ND	---	0.500	"	"	"	"	
m,p-Xylene	ND	---	1.00	"	"	"	"	
o-Xylene	ND	---	0.500	"	"	"	"	
Surrogate: Dibromofluoromethane (Surr)		Recovery: 119 %		Limits: 80-120 %	"	"	"	
1,4-Difluorobenzene (Surr)		105 %		Limits: 80-120 %	"	"	"	
Toluene-d8 (Surr)		111 %		Limits: 80-120 %	"	"	"	
4-Bromofluorobenzene (Surr)		103 %		Limits: 80-120 %	"	"	"	

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Project Number: 1975-01  
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Reported:  
02/19/14 17:59

## ANALYTICAL SAMPLE RESULTS

### Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>EECA Decon Water (A4B0365-01)</b>			<b>Matrix: Water</b>		<b>Batch: 4020342</b>		<b>C-07</b>	
Aroclor 1016	ND	---	0.0952	ug/L	1	02/18/14 11:22	EPA 8082A	
Aroclor 1221	ND	---	0.0952	"	"	"	"	
Aroclor 1232	ND	---	0.0952	"	"	"	"	
Aroclor 1242	ND	---	0.0952	"	"	"	"	
Aroclor 1248	ND	---	0.0952	"	"	"	"	
Aroclor 1254	ND	---	0.0952	"	"	"	"	
Aroclor 1260	ND	---	0.0952	"	"	"	"	
Aroclor 1262	ND	---	0.0952	"	"	"	"	
Aroclor 1268	ND	---	0.0952	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl (Surr)</i>			<i>Recovery: 79 %</i>	<i>Limits: 40-135 %</i>	"	"	"	

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3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
02/19/14 17:59

## ANALYTICAL SAMPLE RESULTS

### Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
EECA Decon Water (A4B0365-01)			Matrix: Water					
Batch: 4020366								
Arsenic	ND	---	1.00	ug/L	1	02/18/14 16:26	EPA 6020A	
Barium	ND	---	1.00	"	"	"	"	
Cadmium	ND	---	0.200	"	"	"	"	
Chromium	ND	---	1.00	"	"	"	"	
Lead	ND	---	1.00	"	"	"	"	
Mercury	ND	---	0.0800	"	"	"	"	
Selenium	ND	---	2.00	"	"	"	"	
Silver	ND	---	0.200	"	"	"	"	

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Project: **Pier 99**  
Project Number: 1975-01  
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Reported:  
02/19/14 17:59

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4020360 - EPA 5030B						Water						
Blank (4020360-BLK1)						Prepared: 02/18/14 09:00    Analyzed: 02/18/14 11:38						
EPA 8260B												
Acetone	ND	---	20.0	ug/L	1	---	---	---	---	---	---	
Benzene	ND	---	0.250	"	"	---	---	---	---	---	---	
Bromobenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
Bromochloromethane	ND	---	1.00	"	"	---	---	---	---	---	---	
Bromodichloromethane	ND	---	1.00	"	"	---	---	---	---	---	---	
Bromoform	ND	---	1.00	"	"	---	---	---	---	---	---	
Bromomethane	ND	---	5.00	"	"	---	---	---	---	---	---	
2-Butanone (MEK)	ND	---	10.0	"	"	---	---	---	---	---	---	
n-Butylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
sec-Butylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
tert-Butylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
Carbon tetrachloride	ND	---	0.500	"	"	---	---	---	---	---	---	
Chlorobenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
Chloroethane	ND	---	5.00	"	"	---	---	---	---	---	---	
Chloroform	ND	---	2.00	"	"	---	---	---	---	---	---	
Chloromethane	ND	---	5.00	"	"	---	---	---	---	---	---	
2-Chlorotoluene	ND	---	1.00	"	"	---	---	---	---	---	---	
4-Chlorotoluene	ND	---	1.00	"	"	---	---	---	---	---	---	
1,2-Dibromo-3-chloroprop ane	ND	---	5.00	"	"	---	---	---	---	---	---	
Dibromochloromethane	ND	---	1.00	"	"	---	---	---	---	---	---	
1,2-Dibromoethane (EDB)	ND	---	0.500	"	"	---	---	---	---	---	---	
Dibromomethane	ND	---	1.00	"	"	---	---	---	---	---	---	
1,2-Dichlorobenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
1,3-Dichlorobenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
1,4-Dichlorobenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
Dichlorodifluoromethane	ND	---	1.00	"	"	---	---	---	---	---	---	
1,1-Dichloroethane	ND	---	0.500	"	"	---	---	---	---	---	---	
1,2-Dichloroethane (EDC)	ND	---	0.500	"	"	---	---	---	---	---	---	
1,1-Dichloroethene	ND	---	0.500	"	"	---	---	---	---	---	---	

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## QUALITY CONTROL (QC) SAMPLE RESULTS

### Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 4020360 - EPA 5030B</b>						<b>Water</b>						
<b>Blank (4020360-BLK1)</b>						Prepared: 02/18/14 09:00 Analyzed: 02/18/14 11:38						
cis-1,2-Dichloroethene	ND	---	0.500	ug/L	"	---	---	---	---	---	---	
trans-1,2-Dichloroethene	ND	---	0.500	"	"	---	---	---	---	---	---	
1,2-Dichloropropane	ND	---	0.500	"	"	---	---	---	---	---	---	
1,3-Dichloropropane	ND	---	1.00	"	"	---	---	---	---	---	---	
2,2-Dichloropropane	ND	---	1.00	"	"	---	---	---	---	---	---	Q-30
1,1-Dichloropropene	ND	---	1.00	"	"	---	---	---	---	---	---	
cis-1,3-Dichloropropene	ND	---	1.00	"	"	---	---	---	---	---	---	
trans-1,3-Dichloropropene	ND	---	1.00	"	"	---	---	---	---	---	---	
Ethylbenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
Hexachlorobutadiene	ND	---	5.00	"	"	---	---	---	---	---	---	
2-Hexanone	ND	---	10.0	"	"	---	---	---	---	---	---	
Isopropylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
4-Isopropyltoluene	ND	---	1.00	"	"	---	---	---	---	---	---	
4-Methyl-2-pentanone (MiBK)	ND	---	10.0	"	"	---	---	---	---	---	---	
Methyl tert-butyl ether (MTBE)	ND	---	1.00	"	"	---	---	---	---	---	---	
Methylene chloride	ND	---	5.00	"	"	---	---	---	---	---	---	
Naphthalene	ND	---	2.00	"	"	---	---	---	---	---	---	
n-Propylbenzene	ND	---	0.500	"	"	---	---	---	---	---	---	
Styrene	ND	---	1.00	"	"	---	---	---	---	---	---	
1,1,1,2-Tetrachloroethane	ND	---	0.500	"	"	---	---	---	---	---	---	
1,1,2,2-Tetrachloroethane	ND	---	0.500	"	"	---	---	---	---	---	---	
Tetrachloroethene (PCE)	ND	---	0.500	"	"	---	---	---	---	---	---	
Toluene	ND	---	1.00	"	"	---	---	---	---	---	---	
1,2,3-Trichlorobenzene	ND	---	2.00	"	"	---	---	---	---	---	---	
1,2,4-Trichlorobenzene	ND	---	2.00	"	"	---	---	---	---	---	---	
1,1,1-Trichloroethane	ND	---	0.500	"	"	---	---	---	---	---	---	
1,1,2-Trichloroethane	ND	---	0.500	"	"	---	---	---	---	---	---	
Trichloroethene (TCE)	ND	---	0.500	"	"	---	---	---	---	---	---	
Trichlorofluoromethane	ND	---	2.00	"	"	---	---	---	---	---	---	
1,2,3-Trichloropropane	ND	---	1.00	"	"	---	---	---	---	---	---	

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Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
02/19/14 17:59

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 4020360 - EPA 5030B</b>						<b>Water</b>						
<b>Blank (4020360-BLK1)</b>						Prepared: 02/18/14 09:00 Analyzed: 02/18/14 11:38						
1,2,4-Trimethylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
1,3,5-Trimethylbenzene	ND	---	1.00	"	"	---	---	---	---	---	---	
Vinyl chloride	ND	---	0.500	"	"	---	---	---	---	---	---	
m,p-Xylene	ND	---	1.00	"	"	---	---	---	---	---	---	
o-Xylene	ND	---	0.500	"	"	---	---	---	---	---	---	
<i>Surr: Dibromofluoromethane (Surr)</i>		<i>Recovery: 118 %</i>		<i>Limits: 80-120 %</i>		<i>Dilution: 1x</i>						
<i>1,4-Difluorobenzene (Surr)</i>		<i>104 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>Toluene-d8 (Surr)</i>		<i>111 %</i>		<i>80-120 %</i>		<i>"</i>						
<i>4-Bromofluorobenzene (Surr)</i>		<i>103 %</i>		<i>80-120 %</i>		<i>"</i>						

**LCS (4020360-BS1)**

Prepared: 02/18/14 09:00 Analyzed: 02/18/14 10:49

<b>EPA 8260B</b>												
Acetone	42.2	---	20.0	ug/L	1	40.0	---	105	70-130%	---	---	
Benzene	17.1	---	0.250	"	"	20.0	---	86	"	---	---	
Bromobenzene	17.8	---	0.500	"	"	"	---	89	"	---	---	
Bromochloromethane	21.2	---	1.00	"	"	"	---	106	"	---	---	
Bromodichloromethane	20.4	---	1.00	"	"	"	---	102	"	---	---	
Bromoform	20.9	---	1.00	"	"	"	---	104	"	---	---	
Bromomethane	21.7	---	5.00	"	"	"	---	108	"	---	---	
2-Butanone (MEK)	45.3	---	10.0	"	"	40.0	---	113	"	---	---	
n-Butylbenzene	21.4	---	1.00	"	"	20.0	---	107	"	---	---	
sec-Butylbenzene	20.9	---	1.00	"	"	"	---	104	"	---	---	
tert-Butylbenzene	21.0	---	1.00	"	"	"	---	105	"	---	---	
Carbon tetrachloride	22.0	---	0.500	"	"	"	---	110	"	---	---	
Chlorobenzene	18.1	---	0.500	"	"	"	---	90	"	---	---	
Chloroethane	47.7	---	5.00	"	"	"	---	238	"	---	---	EST
Chloroform	17.4	---	2.00	"	"	"	---	87	"	---	---	
Chloromethane	17.8	---	5.00	"	"	"	---	89	"	---	---	
2-Chlorotoluene	18.7	---	1.00	"	"	"	---	94	"	---	---	
4-Chlorotoluene	19.9	---	1.00	"	"	"	---	99	"	---	---	
1,2-Dibromo-3-chloroprop ane	19.6	---	5.00	"	"	"	---	98	"	---	---	

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## QUALITY CONTROL (QC) SAMPLE RESULTS

### Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 4020360 - EPA 5030B</b>						<b>Water</b>						
<b>LCS (4020360-BS1)</b>						Prepared: 02/18/14 09:00 Analyzed: 02/18/14 10:49						
Dibromochloromethane	20.7	---	1.00	ug/L	"	"	---	103	"	---	---	
1,2-Dibromoethane (EDB)	20.2	---	0.500	"	"	"	---	101	"	---	---	
Dibromomethane	19.2	---	1.00	"	"	"	---	96	"	---	---	
1,2-Dichlorobenzene	18.6	---	0.500	"	"	"	---	93	"	---	---	
1,3-Dichlorobenzene	18.8	---	0.500	"	"	"	---	94	"	---	---	
1,4-Dichlorobenzene	18.1	---	0.500	"	"	"	---	91	"	---	---	
Dichlorodifluoromethane	17.6	---	1.00	"	"	"	---	88	"	---	---	
1,1-Dichloroethane	18.1	---	0.500	"	"	"	---	91	"	---	---	
1,2-Dichloroethane (EDC)	20.3	---	0.500	"	"	"	---	101	"	---	---	
1,1-Dichloroethene	19.1	---	0.500	"	"	"	---	95	"	---	---	
cis-1,2-Dichloroethene	18.2	---	0.500	"	"	"	---	91	"	---	---	
trans-1,2-Dichloroethene	18.8	---	0.500	"	"	"	---	94	"	---	---	
1,2-Dichloropropane	18.8	---	0.500	"	"	"	---	94	"	---	---	
1,3-Dichloropropane	19.2	---	1.00	"	"	"	---	96	"	---	---	
2,2-Dichloropropane	12.2	---	1.00	"	"	"	---	61	"	---	---	Q-30
1,1-Dichloropropene	18.6	---	1.00	"	"	"	---	93	"	---	---	
cis-1,3-Dichloropropene	17.2	---	1.00	"	"	"	---	86	"	---	---	
trans-1,3-Dichloropropene	18.8	---	1.00	"	"	"	---	94	"	---	---	
Ethylbenzene	19.0	---	0.500	"	"	"	---	95	"	---	---	
Hexachlorobutadiene	18.8	---	5.00	"	"	"	---	94	"	---	---	
2-Hexanone	45.5	---	10.0	"	"	40.0	---	114	"	---	---	
Isopropylbenzene	19.7	---	1.00	"	"	20.0	---	99	"	---	---	
4-Isopropyltoluene	20.4	---	1.00	"	"	"	---	102	"	---	---	
4-Methyl-2-pentanone (MiBK)	48.7	---	10.0	"	"	40.0	---	122	"	---	---	
Methyl tert-butyl ether (MTBE)	18.0	---	1.00	"	"	20.0	---	90	"	---	---	
Methylene chloride	16.2	---	5.00	"	"	"	---	81	"	---	---	
Naphthalene	16.8	---	2.00	"	"	"	---	84	"	---	---	
n-Propylbenzene	20.0	---	0.500	"	"	"	---	100	"	---	---	
Styrene	17.3	---	1.00	"	"	"	---	87	"	---	---	
1,1,1,2-Tetrachloroethane	20.6	---	0.500	"	"	"	---	103	"	---	---	

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
02/19/14 17:59

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Volatile Organic Compounds by EPA 8260B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 4020360 - EPA 5030B</b>						<b>Water</b>						
<b>LCS (4020360-BS1)</b>						Prepared: 02/18/14 09:00 Analyzed: 02/18/14 10:49						
1,1,2,2-Tetrachloroethane	20.6	---	0.500	"	"	"	---	103	"	---	---	
Tetrachloroethene (PCE)	18.8	---	0.500	"	"	"	---	94	"	---	---	
Toluene	18.3	---	1.00	"	"	"	---	91	"	---	---	
1,2,3-Trichlorobenzene	18.7	---	2.00	"	"	"	---	94	"	---	---	
1,2,4-Trichlorobenzene	18.1	---	2.00	"	"	"	---	90	"	---	---	
1,1,1-Trichloroethane	20.0	---	0.500	"	"	"	---	100	"	---	---	
1,1,2-Trichloroethane	19.6	---	0.500	"	"	"	---	98	"	---	---	
Trichloroethene (TCE)	18.2	---	0.500	"	"	"	---	91	"	---	---	
Trichlorofluoromethane	109	---	2.00	"	"	"	---	543	"	---	---	EST
1,2,3-Trichloropropane	20.6	---	1.00	"	"	"	---	103	"	---	---	
1,2,4-Trimethylbenzene	20.3	---	1.00	"	"	"	---	101	"	---	---	
1,3,5-Trimethylbenzene	20.3	---	1.00	"	"	"	---	102	"	---	---	
Vinyl chloride	19.3	---	0.500	"	"	"	---	97	"	---	---	
m,p-Xylene	39.3	---	1.00	"	"	40.0	---	98	"	---	---	
o-Xylene	19.0	---	0.500	"	"	20.0	---	95	"	---	---	
<hr/>												
Surr: Dibromofluoromethane (Surr)		Recovery: 114 %		Limits: 80-120 %		Dilution: 1x						
1,4-Difluorobenzene (Surr)		101 %		80-120 %		"						
Toluene-d8 (Surr)		109 %		80-120 %		"						
4-Bromofluorobenzene (Surr)		100 %		80-120 %		"						

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
02/19/14 17:59

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4020342 - EPA 3510C (Neutral pH)						Water						
Blank (4020342-BLK1)				Prepared: 02/18/14 06:49		Analyzed: 02/18/14 11:40					C-07	
EPA 8082A												
Aroclor 1016	ND	---	0.0909	ug/L	1	---	---	---	---	---	---	
Aroclor 1221	ND	---	0.0909	"	"	---	---	---	---	---	---	
Aroclor 1232	ND	---	0.0909	"	"	---	---	---	---	---	---	
Aroclor 1242	ND	---	0.0909	"	"	---	---	---	---	---	---	
Aroclor 1248	ND	---	0.0909	"	"	---	---	---	---	---	---	
Aroclor 1254	ND	---	0.0909	"	"	---	---	---	---	---	---	
Aroclor 1260	ND	---	0.0909	"	"	---	---	---	---	---	---	
Aroclor 1262	ND	---	0.0909	"	"	---	---	---	---	---	---	
Aroclor 1268	ND	---	0.0909	"	"	---	---	---	---	---	---	
Surr: Decachlorobiphenyl (Surr)		Recovery: 90 %		Limits: 40-135 %		Dilution: 1x						
LCS (4020342-BS1)				Prepared: 02/18/14 06:49		Analyzed: 02/18/14 11:58					C-07	
EPA 8082A												
Aroclor 1016	1.92	---	0.100	ug/L	1	2.50	---	77	40-140%	---	---	
Aroclor 1260	2.22	---	0.100	"	"	"	---	89	"	---	---	
Surr: Decachlorobiphenyl (Surr)		Recovery: 102 %		Limits: 40-135 %		Dilution: 1x						
LCS Dup (4020342-BSD1)				Prepared: 02/18/14 06:49		Analyzed: 02/18/14 12:16					C-07, Q-19	
EPA 8082A												
Aroclor 1016	2.00	---	0.100	ug/L	1	2.50	---	80	40-140%	4	30%	
Aroclor 1260	2.24	---	0.100	"	"	"	---	90	"	1	30%	
Surr: Decachlorobiphenyl (Surr)		Recovery: 99 %		Limits: 40-135 %		Dilution: 1x						

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John FoxwellReported:  
02/19/14 17:59

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4020366 - EPA 3015A						Water						
Blank (4020366-BLK1)						Prepared: 02/18/14 12:17		Analyzed: 02/18/14 15:49				
EPA 6020A												
Arsenic	ND	---	1.00	ug/L	1	---	---	---	---	---	---	Q-41
Barium	ND	---	1.00	"	"	---	---	---	---	---	---	
Cadmium	ND	---	0.200	"	"	---	---	---	---	---	---	
Chromium	ND	---	1.00	"	"	---	---	---	---	---	---	
Lead	ND	---	0.200	"	"	---	---	---	---	---	---	
Mercury	ND	---	0.0800	"	"	---	---	---	---	---	---	Q-41
Selenium	ND	---	1.00	"	"	---	---	---	---	---	---	
Silver	ND	---	0.200	"	"	---	---	---	---	---	---	
LCS (4020366-BS1)						Prepared: 02/18/14 12:17		Analyzed: 02/18/14 15:52				
EPA 6020A												
Arsenic	56.8	---	1.00	ug/L	1	55.6	---	102	80-120%	---	---	Q-41
Barium	55.5	---	1.00	"	"	"	---	100	"	---	---	
Cadmium	55.6	---	0.200	"	"	"	---	100	"	---	---	
Chromium	56.9	---	1.00	"	"	"	---	102	"	---	---	
Lead	54.8	---	0.200	"	"	"	---	99	"	---	---	
Mercury	1.11	---	0.0800	"	"	1.11	---	100	"	---	---	
Selenium	26.8	---	1.00	"	"	27.8	---	96	"	---	---	
Silver	27.6	---	0.200	"	"	"	---	99	"	---	---	

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell**Reported:**  
02/19/14 17:59

## SAMPLE PREPARATION INFORMATION

## Volatile Organic Compounds by EPA 8260B

**Prep: EPA 5030B**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 4020360							
A4B0365-01	Water	EPA 8260B	02/17/14 14:21	02/18/14 11:21	5mL/5mL	5mL/5mL	1.00

## Polychlorinated Biphenyls by EPA 8082A

**Prep: EPA 3510C (Neutral pH)**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 4020342							
A4B0365-01	Water	EPA 8082A	02/17/14 14:21	02/18/14 06:49	1050mL/5mL	1000mL/5mL	0.95

## Total Metals by EPA 6020 (ICPMS)

**Prep: EPA 3015A**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 4020366							
A4B0365-01	Water	EPA 6020A	02/17/14 14:21	02/18/14 12:17	45mL/50mL	45mL/50mL	1.00

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Darrell Auvil For Darwin Thomas, Business Development Director

Page 14 of 16

**Apex Companies, LLC**

3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**

Project Number: 1975-01

Project Manager: John Foxwell

**Reported:**

02/19/14 17:59

## Notes and Definitions

### Qualifiers:

- C-07 Extract has undergone Sulfuric Acid Cleanup by EPA 3665A, Sulfur Cleanup by EPA 3660B, and Florisil Cleanup by EPA 3620B in order to minimize matrix interference.
- EST Result reported as an Estimated Value. Recovery for Lab Control Spike (LCS) is above the upper control limit. Data may be biased high.
- Q-19 Blank Spike Duplicate (BSD) sample analyzed in place of Matrix Spike/Duplicate samples due to limited sample amount available for analysis.
- Q-30 Recovery for Lab Control Spike (LCS) is below the lower control limit. Data may be biased low.
- Q-41 Estimated Results. Recovery of Continuing Calibration Verification sample above upper control limit for this analyte. Results are likely biased high.

### Notes and Conventions:

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.
- RPD Relative Percent Difference
- MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.
- WMSC Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.
- Batch QC Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.
- Blank Policy Apex assesses blank data for potential high bias down to a level equal to 1/2 the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.  
  
For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.  
  
Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.
- QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.
- \*\*\* Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

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Darrell Auvin For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
02/19/14 17:59

Lab # 44B0365 COC #     

## CHAIN OF CUSTODY

**APEX LABS** 12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: <b>Apex Companies</b>		Project Mgr: <b>Foxwell</b>		Project Name: <b>per 99</b>		Project # <b>1975-01</b>	
Address: <b>Apex Companies</b>		Phone: <b>503 920 4704</b>		Fax: <b>503 920 4704</b>		Email: <b>foxwell@apexlabs.com</b>	
Sampled by: <b>EECH Dean Water</b>		Site Location: <b>OW WA</b>		Other: <b>    </b>		ANALYSIS REQUEST	
LAB ID # <b>2/17/14</b>		DATE <b>2/17/14</b>		TIME <b>1400</b>		# OF CONTAINERS <b>6</b>	
SAMPLE ID <b>EECH Dean Water</b>		MATRIX <b>    </b>		TAT Requested (circle) <b>1 Day</b>		Normal Turn Around Time (TAT) = 7-10 Business Days	
RELINQUISHED BY: <b>John Foxwell</b>		RECEIVED BY: <b>John Foxwell</b>		RELINQUISHED BY: <b>John Foxwell</b>		RECEIVED BY: <b>John Foxwell</b>	
Signature: <b>John Foxwell</b>		Signature: <b>John Foxwell</b>		Signature: <b>John Foxwell</b>		Signature: <b>John Foxwell</b>	
Printed Name: <b>John Foxwell</b>		Printed Name: <b>John Foxwell</b>		Printed Name: <b>John Foxwell</b>		Printed Name: <b>John Foxwell</b>	
Time: <b>15:17</b>		Time: <b>15:17</b>		Time: <b>15:17</b>		Time: <b>15:17</b>	
Company: <b>Apex Companies</b>		Company: <b>Apex Companies</b>		Company: <b>Apex Companies</b>		Company: <b>Apex Companies</b>	

SPECIAL INSTRUCTIONS:

# Apex Labs

12232 S.W. Garden Place  
Tigard, OR 97223  
503-718-2323 Phone  
503-718-0333 Fax

Monday, July 7, 2014

John Foxwell  
Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

RE: Pier 99 / Pier 99

Enclosed are the results of analyses for work order A4F0761, which was received by the laboratory on 6/30/2014 at 5:25:00PM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: [DAuvil@apex-labs.com](mailto:DAuvil@apex-labs.com), or by phone at 503-718-2323.

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Apex Laboratories



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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: Pier 99  
Project Manager: John Foxwell

**Reported:**  
07/07/14 09:39

## ANALYTICAL REPORT FOR SAMPLES

### SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
<b>REX-18</b>	A4F0761-01	Soil	06/30/14 12:31	06/30/14 17:25
<b>Waste Profile Sample</b>	A4F0761-02	Soil	06/30/14 12:45	06/30/14 17:25

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: Pier 99  
Project Manager: John Foxwell

**Reported:**  
07/07/14 09:39

## ANALYTICAL SAMPLE RESULTS

### Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
REX-18 (A4F0761-01)			Matrix: Soil					
Batch: 4070016								
Lead	426	0.138	0.275	mg/kg dry	10	07/02/14 11:34	EPA 6020A	B-02

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: Pier 99  
Project Manager: John Foxwell

**Reported:**  
07/07/14 09:39

## ANALYTICAL SAMPLE RESULTS

### TCLP Extraction by EPA 1311

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>Waste Profile Sample (A4F0761-02)</b>			<b>Matrix: Soil</b>		<b>Batch: 4070027</b>			
TCLP Extraction	0.00	---		N/A	1	07/01/14 16:19	EPA 1311	

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: Pier 99  
Project Manager: John Foxwell

**Reported:**  
07/07/14 09:39

## ANALYTICAL SAMPLE RESULTS

### TCLP Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
Waste Profile Sample (A4F0761-02)			Matrix: Soil					
Batch: 4070055								
Lead	1.16	---	0.0500	mg/L	5	07/02/14 11:55	1311/6020A	

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: Pier 99  
Project Manager: John Foxwell

**Reported:**  
07/07/14 09:39

## ANALYTICAL SAMPLE RESULTS

### Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-18 (A4F0761-01)</b>			<b>Matrix: Soil</b>		<b>Batch: 4060868</b>			
% Solids	79.5	---	1.00	% by Weight	1	07/01/14 10:07	EPA 8000C	

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Darrell Auvil For Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: Pier 99  
Project Manager: John Foxwell**Reported:**  
07/07/14 09:39

## QUALITY CONTROL (QC) SAMPLE RESULTS

## Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4070016 - EPA 3051A						Soil						
Blank (4070016-BLK2)					Prepared: 07/01/14 10:55		Analyzed: 07/02/14 12:07					
EPA 6020A												
Lead	0.130	0.100	0.200	mg/kg wet	10	---	---	---	---	---	---	B-02, Q-16, J
LCS (4070016-BS1)					Prepared: 07/01/14 10:55		Analyzed: 07/01/14 16:54					
EPA 6020A												
Lead	53.9	0.100	0.200	mg/kg wet	10	50.0	---	108	80-120%	---	---	B-02
Matrix Spike (4070016-MS2)					Prepared: 07/01/14 10:55		Analyzed: 07/02/14 11:40					
QC Source Sample: REX-18 (A4F0761-01)												
EPA 6020A												
Lead	745	0.134	0.268	mg/kg dry	10	67.1	426	476	75-125%	---	---	B-02, Q-03

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Page 7 of 12

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201Project: **Pier 99**  
Project Number: Pier 99  
Project Manager: John FoxwellReported:  
07/07/14 09:39

## QUALITY CONTROL (QC) SAMPLE RESULTS

## TCLP Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4070055 - EPA 1311/3015						Soil						
Blank (4070055-BLK1)				Prepared: 07/02/14 10:32		Analyzed: 07/02/14 12:04						
1311/6020A												
Lead	ND	---	0.0500	mg/L	5	---	---	---	---	---	---	TCLP
LCS (4070055-BS1)				Prepared: 07/02/14 10:32		Analyzed: 07/02/14 11:46						
1311/6020A												
Lead	2.58	---	0.0500	mg/L	5	2.50	---	103	80-120%	---	---	TCLP
Matrix Spike (4070055-MS2)				Prepared: 07/02/14 10:32		Analyzed: 07/02/14 11:58						
QC Source Sample: Waste Profile Sample (A4F0761-02)												
1311/6020A												
Lead	3.81	---	0.0500	mg/L	5	2.50	1.16	106	50-150%	---	---	

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Page 8 of 12

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: Pier 99  
Project Manager: John Foxwell

Reported:  
07/07/14 09:39

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----	-----------------	-------	------	--------------	---------------	------	-------------	-----	-----------	-------

### Batch 4060868 - Total Solids (Dry Weight)

### Soil

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: Pier 99  
Project Manager: John Foxwell

**Reported:**  
07/07/14 09:39

## SAMPLE PREPARATION INFORMATION

### Total Metals by EPA 6020 (ICPMS)

#### Prep: EPA 3051A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 4070016							
A4F0761-01	Soil	EPA 6020A	06/30/14 12:31	07/01/14 10:55	0.457g/50mL	0.5g/50mL	1.09

### TCLP Extraction by EPA 1311

#### Prep: EPA 1311 (TCLP)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 4070027							
A4F0761-02	Soil	EPA 1311	06/30/14 12:45	07/01/14 16:19	100g/2000mL	100g/2000mL	NA

### TCLP Metals by EPA 6020 (ICPMS)

#### Prep: EPA 1311/3015

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 4070055							
A4F0761-02	Soil	1311/6020A	06/30/14 12:45	07/02/14 10:32	5mL/50mL	5mL/50mL	1.00

### Percent Dry Weight

#### Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 4060868							
A4F0761-01	Soil	EPA 8000C	06/30/14 12:31	06/30/14 19:55	1N/A/1N/A	1N/A/1N/A	NA

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Darrell Auvin For Darwin Thomas, Business Development Director

Page 10 of 12

**Apex Companies, LLC**

3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**

Project Number: Pier 99  
Project Manager: John Foxwell

**Reported:**  
07/07/14 09:39

## Notes and Definitions

### Qualifiers:

- B-02 Analyte detected in an associated blank at a level between one-half the MRL and the MRL. (See Notes and Conventions below.)
- J Estimated Result. Result detected below the lowest point of the calibration curve, but above the specified MDL.
- Q-03 Spike recovery and/or RPD is outside control limits due to the high concentration of analyte present in the sample.
- Q-16 Reanalysis of an original Batch QC sample.
- TCLP This batch QC sample was prepared with TCLP or SPLP fluid from preparation batch 4070027.

### Notes and Conventions:

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.
- RPD Relative Percent Difference
- MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.
- WMSOC Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.
- Batch QC Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.
- Blank Policy Apex assesses blank data for potential high bias down to a level equal to 1/2 the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.  
  
For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.  
  
Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.
- QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.
- \*\*\* Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

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Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: Pier 99  
Project Manager: John Foxwell

Reported:  
07/07/14 09:39

**APEX LABS** **CHAIN OF CUSTODY** Lab # A4F0761 of      COC

12232 S.W. Garden Place, Tigard, OR 97223 PO: 503-718-2323 Fax: 503-718-0333

Company: <u>Apex Cos.</u>		Project Mgr: <u>Foxwell</u>		Project Name: <u>Pier 99</u>		Project #																																																																																																																																																	
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Apex Laboratories

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*[Signature]*

# Apex Labs

12232 S.W. Garden Place  
Tigard, OR 97223  
503-718-2323 Phone  
503-718-0333 Fax

Tuesday, August 5, 2014

John Foxwell  
Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

RE: Pier 99 / 1975-01

Enclosed are the results of analyses for work order A4G0126, which was received by the laboratory on 7/7/2014 at 11:36:00AM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: [dthomas@apex-labs.com](mailto:dthomas@apex-labs.com), or by phone at 503-718-2323.

---

Apex Laboratories



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---

Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

**Reported:**  
08/05/14 13:09

## ANALYTICAL REPORT FOR SAMPLES

### SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
REX-19 Comp	A4G0126-01	Soil	07/02/14 09:10	07/07/14 11:36
REX-20	A4G0126-02	Soil	07/02/14 09:32	07/07/14 11:36
REX-21 Comp	A4G0126-03	Soil	07/02/14 09:40	07/07/14 11:36
REX-22 Comp	A4G0126-04	Soil	07/02/14 10:00	07/07/14 11:36

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Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
08/05/14 13:09

## ANALYTICAL SAMPLE RESULTS

### Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
REX-19 Comp (A4G0126-01)			Matrix: Soil					
Batch: 4070198								
Lead	950	0.123	0.246	mg/kg dry	10	07/09/14 15:18	EPA 6020A	
REX-20 (A4G0126-02)			Matrix: Soil					
Batch: 4070198								
Lead	63.6	0.115	0.230	mg/kg dry	10	07/09/14 15:27	EPA 6020A	
REX-21 Comp (A4G0126-03)			Matrix: Soil					
Batch: 4070198								
Lead	2820	0.666	1.33	mg/kg dry	50	07/09/14 16:19	EPA 6020A	
REX-22 Comp (A4G0126-04)			Matrix: Soil					
Batch: 4070198								
Lead	6460	0.756	1.51	mg/kg dry	50	07/09/14 16:21	EPA 6020A	

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Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
08/05/14 13:09

## ANALYTICAL SAMPLE RESULTS

Percent Dry Weight								
Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
<b>REX-19 Comp (A4G0126-01)</b>			<b>Matrix: Soil</b>		<b>Batch: 4070185</b>			
% Solids	89.6	---	1.00	% by Weight	1	07/09/14 09:59	EPA 8000C	
<b>REX-20 (A4G0126-02)</b>			<b>Matrix: Soil</b>		<b>Batch: 4070185</b>			
% Solids	96.5	---	1.00	% by Weight	1	07/09/14 09:59	EPA 8000C	
<b>REX-21 Comp (A4G0126-03)</b>			<b>Matrix: Soil</b>		<b>Batch: 4070185</b>			
% Solids	82.9	---	1.00	% by Weight	1	07/09/14 09:59	EPA 8000C	
<b>REX-22 Comp (A4G0126-04)</b>			<b>Matrix: Soil</b>		<b>Batch: 4070185</b>			
% Solids	70.5	---	1.00	% by Weight	1	07/09/14 09:59	EPA 8000C	

Apex Laboratories



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Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
08/05/14 13:09

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4070198 - EPA 3051A						Soil						
Blank (4070198-BLK1)						Prepared: 07/09/14 09:10		Analyzed: 07/09/14 14:56				
EPA 6020A												
Lead	ND	0.100	0.200	mg/kg wet	10	---	---	---	---	---	---	
LCS (4070198-BS1)						Prepared: 07/09/14 09:10		Analyzed: 07/09/14 14:59				
EPA 6020A												
Lead	53.6	0.100	0.200	mg/kg wet	10	50.0	---	107	80-120%	---	---	
Duplicate (4070198-DUP1)						Prepared: 07/09/14 09:10		Analyzed: 07/09/14 15:21				
QC Source Sample: REX-19 Comp (A4G0126-01)												
EPA 6020A												
Lead	782	0.108	0.215	mg/kg dry	10	---	950	---	---	19	40%	
Matrix Spike (4070198-MS2)						Prepared: 07/09/14 09:10		Analyzed: 07/09/14 16:16				
QC Source Sample: REX-19 Comp (A4G0126-01)												
EPA 6020A												
Lead	1140	0.544	1.09	mg/kg dry	50	54.4	950	350	75-125%	---	---	Q-03

Apex Laboratories



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Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
08/05/14 13:09

## QUALITY CONTROL (QC) SAMPLE RESULTS

### Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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### Batch 4070185 - Total Solids (Dry Weight)

### Soil

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

Apex Laboratories



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3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
08/05/14 13:09

## SAMPLE PREPARATION INFORMATION

### Total Metals by EPA 6020 (ICPMS)

#### Prep: EPA 3051A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 4070198							
A4G0126-01	Soil	EPA 6020A	07/02/14 09:10	07/09/14 09:10	0.454g/50mL	0.5g/50mL	1.10
A4G0126-02	Soil	EPA 6020A	07/02/14 09:32	07/09/14 09:10	0.45g/50mL	0.5g/50mL	1.11
A4G0126-03	Soil	EPA 6020A	07/02/14 09:40	07/09/14 09:10	0.453g/50mL	0.5g/50mL	1.10
A4G0126-04	Soil	EPA 6020A	07/02/14 10:00	07/09/14 09:10	0.469g/50mL	0.5g/50mL	1.07

### Percent Dry Weight

#### Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 4070185							
A4G0126-01	Soil	EPA 8000C	07/02/14 09:10	07/08/14 14:57	1N/A/1N/A	1N/A/1N/A	NA
A4G0126-02	Soil	EPA 8000C	07/02/14 09:32	07/08/14 14:57	1N/A/1N/A	1N/A/1N/A	NA
A4G0126-03	Soil	EPA 8000C	07/02/14 09:40	07/08/14 14:57	1N/A/1N/A	1N/A/1N/A	NA
A4G0126-04	Soil	EPA 8000C	07/02/14 10:00	07/08/14 14:57	1N/A/1N/A	1N/A/1N/A	NA

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Darwin Thomas, Business Development Director

Apex Companies, LLC  
3015 SW First Avenue  
Portland, OR 97201

Project: **Pier 99**  
Project Number: 1975-01  
Project Manager: John Foxwell

Reported:  
08/05/14 13:09

## Notes and Definitions

### Qualifiers:

Q-03 Spike recovery and/or RPD is outside control limits due to the high concentration of analyte present in the sample.

### Notes and Conventions:

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.

RPD Relative Percent Difference

MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.

WMSC Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.

Batch QC Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.

Blank Policy Apex assesses blank data for potential high bias down to a level equal to ½ the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.

For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.

Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.

--- QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

\*\*\* Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Apex Laboratories



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Darwin Thomas, Business Development Director

**Reported:**  
08/05/14 13:09

Page 9 of 9